

ACCOUNTING

First edition

10 units

50 lessons + exams

A video for every lesson

FIRST EDITION

COURSE GUIDE

This is a full-year, college-preparatory course in financial and managerial accounting for students in grades 10–12. It covers the accounting equation and double entry, debits and credits, the journal, ledger and trial balance, the whole accounting cycle with adjusting and closing entries, the four financial statements, cash and internal control, receivables and inventory, plant assets, notes and payroll, partnerships and corporations, ratio analysis and auditing, and finally managerial accounting: cost behavior, break-even, job and process costing, budgets and present value. Every lesson has two to four fully worked examples, a practice set of 8 to 12 problems with answers, and a project in which the student keeps real books. Each unit ends with a 100-point test, and there is a midterm after Unit 5 and a final after Unit 10.

Accounting was built by people solving real problems, and each lesson begins with **the story**: the merchants of Venice whose books Pacioli printed in 1494, the Medici branch partners, the Dutch East India Company's first shareholders, Josiah Wedgwood hunting for his lost profits, James Ritty's "incorruptible cashier," Andrew Carnegie's cost sheets, the Match King's forged bonds and Enron's hidden debts. Then comes **how they figured it out, the big idea** with its rules and worked numbers, and **in business today**, where the student sees the idea used by shops, companies, churches and charities. The six stakeholders return throughout: financiers, risk-takers, builders, workers, customers and the community all depend on honest books.

The course treats accounting as a calling of trust. Scripture asks for just weights and honest measures (Proverbs 11:1) and tells the steward to "be thou diligent to know the state of thy flocks" (Proverbs 27:23). An accountant keeps a business honest with itself and with everyone who depends on it. By the end of the year the student will have kept a complete set of books for a small business through two full accounting

cycles, and will be ready for a college accounting course or for keeping the books of a family business, a church or a small firm.

Most videos come from teaching channels that explain accounting step by step: Accounting Stuff, Edspira (Dr. Michael McLaughlin), Tony Bell, The Finance Storyteller and a few others, chosen lesson by lesson. A few history lessons use documentary or museum clips. Every video was checked in preview for accuracy and content, and none comes from a channel that takes sides in present-day public debates. Some channels end with an invitation to subscribe or to visit their own website; you can stop when the teaching ends. Where a video uses a slightly different format for an entry or a statement, follow the format in the lesson, and notice that the accounting is the same.

Start with Lesson 1.1 →

WHO IT IS FOR

Written for students in grades 10–12 who have completed Algebra I: they can work with percents, ratios, formulas and simple equations. No earlier bookkeeping is needed. Students work fairly independently, reading the lesson and working the examples themselves; a parent or mentor checks the practice sets against the answers, discusses the essay questions and reviews the books at the end of each unit. Nothing needs to be bought: a calculator, a notebook, columnar ledger paper (or a free printable) and free spreadsheet software are enough.

HOW TO USE THIS COURSE

1. **The weekly rhythm.** Each lesson takes three sessions of about 50 minutes. Session 1: the warm-up, the video, the core ideas and the worked examples. Session 2: the project and the ledger notebook. Session 3: the practice set, checked against the answers, with every missed problem corrected. Each unit ends with a test day, and the midterm and final each have a review day. At five sessions a week the course fills a school year of about 33 weeks.
2. **Story, then the rule, then the numbers.** Read the core ideas in order. The story and “how they figured it out” explain why the rule exists; the rule is easier to remember when you know the problem it solved. Then cover the solution of each worked example, try it yourself, and compare line by line.

3. **Every entry balances.** In this course every journal entry has equal debits and credits, every trial balance has equal columns, and every balance sheet satisfies $\text{assets} = \text{liabilities} + \text{equity}$. When your numbers do not balance, do not force them: find the error. Finding errors is half of what an accountant does, and Lesson 2.5 teaches how.
4. **Practice sets.** Problems are marked easy, medium, hard and challenge. Do all of the easy and medium problems and most of the hard ones; the challenge problem is for students who want more. Mark your work against the answers the same day and rework every miss.
5. **The ledger notebook.** Keep one notebook, or a binder of columnar ledger paper, for the whole year. Journal entries, T-accounts, trial balances, statements and the notes from each picture study all go in it, dated and neat. Never erase in a ledger: draw one line through an error, write the correction above it, and initial it.
6. **Spreadsheets.** Do each new skill by hand first, then rebuild it in a free spreadsheet (Google Sheets or LibreOffice Calc). The free accounting program GnuCash is optional in Units 2, 3 and 10 for students who want to see the same books kept by software.
7. **Picture study.** Each lesson has one public-domain painting, print or historic photograph of merchants, counting rooms, banks, stores and factories. Look at it quietly for two minutes, then work through the “look for” items and questions, which tie the picture to the lesson’s accounting idea.
8. **The six stakeholders.** Financial statements are written for people: the financiers who lend and invest, the risk-takers who own, the builders and managers who run the business, the workers, the customers and the community. Whenever you read a set of statements, ask what they tell each group, and who would be hurt if they were false.
9. **Unit tests, midterm and final.** Each unit test is worth 100 points, with calculations, concept questions and one short essay. A calculator is allowed and work must be shown. The midterm covers Units 1–5 and the final covers the whole course.
10. **Real records and privacy.** Some projects use family or small-business records. Use them only with a parent’s permission, black out account numbers and personal details, and never post them online. The practice businesses in the lessons are invented for teaching; the historical stories are real.

SCOPE AND SEQUENCE

UNIT 1 • WEEKS 1–4

The Language of Business

Pacioli and the merchants of Venice; the accounting equation; the double-entry idea; the chart of accounts; and why honest books matter.

- 1.1 Pacioli and the Merchants of Venice
- 1.2 The Accounting Equation
- 1.3 The Double-Entry Idea: Datini of Prato
- 1.4 The Chart of Accounts: Fugger’s Counting Room
- 1.5 Why Honest Books Matter

UNIT 3 • WEEKS 7–10

The Accounting Cycle

Accrual versus cash accounting; adjusting entries; the worksheet; closing entries; and a full accounting cycle for a small business.

- 3.1 Accrual versus Cash: From Voyages to Periods
- 3.2 Adjusting Entries: Franklin’s Fire Insurance
- 3.3 The Worksheet: Accountants’ Spreadsheets
- 3.4 Closing Entries: The Day of Reckoning
- 3.5 The Full Cycle: Lincoln’s Store and a Practice Set

UNIT 2 • WEEKS 4–7

Recording Transactions

Debits and credits and normal balances; the general journal; posting to the ledger; the trial balance; and finding and correcting errors.

- 2.1 Debits and Credits: The Merchant’s Trust
- 2.2 The Journal: George Washington’s Account Books
- 2.3 Posting to the Ledger
- 2.4 The Trial Balance
- 2.5 Finding and Correcting Errors

UNIT 4 • WEEKS 10–13

Financial Statements

The income statement, the statement of owner’s equity, the classified balance sheet and the statement of cash flows, then reading a real annual report from U.S. Steel’s first audited report to the 10-K.

- 4.1 The Income Statement: Wedgwood Finds His Costs
- 4.2 The Statement of Owner’s Equity: Franklin and Hall
- 4.3 The Balance Sheet: The Bank of England Reports
- 4.4 The Statement of Cash Flows: Profitable and Broke
- 4.5 Reading a Real Annual Report: U.S. Steel to the 10-K

UNIT 5 • WEEKS 13–17

Cash and Internal Control

Bank reconciliations; petty cash and the cash register; internal control and separation of duties; Ivar Kreuger and the 1932 collapse; and the ethics and vocation of the accountant.

- 5.1 Cash and the Bank Reconciliation
- 5.2 Petty Cash and the Incorruptible Cashier
- 5.3 Internal Control and Separation of Duties
- 5.4 Fraud: Ivar Kreuger and the 1932 Collapse
- 5.5 Ethics and the Accountant's Vocation

UNIT 7 • WEEKS 20–23

Long-Term Assets and Liabilities

Plant assets and straight-line depreciation; declining-balance and units-of-production methods; notes and interest; payroll and payroll taxes; and bonds and leases, simply.

- 7.1 Plant Assets and Straight-Line Depreciation: Arkwright's Mill
- 7.2 Declining-Balance and Units-of-Production Depreciation
- 7.3 Notes and Interest: Fugger Lends to an Emperor
- 7.4 Payroll and Payroll Taxes: Ford's \$5 Day
- 7.5 Bonds and Leases, Simply

UNIT 6 • WEEKS 17–20

Receivables and Inventory

Credit sales and accounts receivable; bad debts and the allowance method; periodic and perpetual inventory; FIFO, LIFO and average cost; and cost of goods sold and gross margin.

- 6.1 Accounts Receivable: Singer Sells on Credit
- 6.2 Bad Debts: The Medici and the King
- 6.3 Inventory Systems: From the Counting Book to the Bar Code
- 6.4 FIFO, LIFO and Average Cost
- 6.5 Cost of Goods Sold and Gross Margin: Woolworth's Five and Ten

UNIT 8 • WEEKS 23–26

Partnerships and Corporations

Partnerships on the Medici model; the corporation from the Dutch East India Company to today; issuing stock and paying dividends; retained earnings; and nonprofit and church accounting.

- 8.1 Partnerships: The Medici Model
- 8.2 The Corporation: From the Dutch East India Company to Today
- 8.3 Stock: Issuing Shares from Buttonwood to Today
- 8.4 Dividends and Retained Earnings: Ford versus the Dodge Brothers
- 8.5 Nonprofit and Church Accounting: George Müller's Reports

UNIT 9 • WEEKS 27–30

Analysis and Auditing

Liquidity and solvency ratios; profitability and the DuPont formula; auditing and the CPA; Enron, Arthur Andersen and the 2002 reforms; and careers in accounting.

- 9.1 Ratio Analysis: Liquidity and Solvency
- 9.2 Profitability and the DuPont Formula
- 9.3 Auditing and the CPA: The McKesson & Robbins Case
- 9.4 Enron, Arthur Andersen and the 2002 Reforms
- 9.5 Careers in Accounting

UNIT 10 • WEEKS 30–33

Managerial Accounting

Cost behavior and break-even; job and process costing with Carnegie's cost sheets; budgets; capital decisions and present value; and a capstone practice set for a small business.

- 10.1 Cost Behavior and Break-Even: Counting the Cost
- 10.2 Job and Process Costing: Carnegie's Cost Sheets
- 10.3 Budgets: Joseph's Seven Years
- 10.4 Capital Decisions and Present Value: Franklin's 200-Year Gift
- 10.5 Capstone: Milton Hershey and a Small Business's Books

WEEKLY PACING CALENDAR

WEEK	PLAN
1	- Day 1: Lesson 1.1 Pacioli and the Merchants of Venice: video, teaching and worked examples - Day 2: Lesson 1.1: project and notebook - Day 3: Lesson 1.1: practice set and corrections - Day 4: Lesson 1.2 The Accounting Equation: video, teaching and worked examples - Day 5: Lesson 1.2: project and notebook <i>Five sessions a week of about 50 minutes. Families on a four-day week can combine the practice day of one lesson with the teaching day of the next.</i>
2	- Day 1: Lesson 1.2: practice set and corrections - Day 2: Lesson 1.3 The Double-Entry Idea: Datini of Prato: video, teaching and worked examples - Day 3: Lesson 1.3: project and notebook - Day 4: Lesson 1.3: practice set and corrections - Day 5: Lesson 1.4 The Chart of Accounts: Fugger's Counting Room: video, teaching and worked examples
3	Day 1: Lesson 1.4: project and notebook

WEEK	PLAN
	• Day 2: Lesson 1.4: practice set and corrections • Day 3: Lesson 1.5 Why Honest Books Matter: video, teaching and worked examples • Day 4: Lesson 1.5: project and notebook • Day 5: Lesson 1.5: practice set and corrections
4	• Day 1: Unit 1 test • Day 2: Lesson 2.1 Debits and Credits: The Merchant's Trust: video, teaching and worked examples • Day 3: Lesson 2.1: project and notebook • Day 4: Lesson 2.1: practice set and corrections • Day 5: Lesson 2.2 The Journal: George Washington's Account Books: video, teaching and worked examples
5	• Day 1: Lesson 2.2: project and notebook • Day 2: Lesson 2.2: practice set and corrections • Day 3: Lesson 2.3 Posting to the Ledger: video, teaching and worked examples • Day 4: Lesson 2.3: project and notebook • Day 5: Lesson 2.3: practice set and corrections
6	• Day 1: Lesson 2.4 The Trial Balance: video, teaching and worked examples • Day 2: Lesson 2.4: project and notebook • Day 3: Lesson 2.4: practice set and corrections • Day 4: Lesson 2.5 Finding and Correcting Errors: video, teaching and worked examples • Day 5: Lesson 2.5: project and notebook
7	• Day 1: Lesson 2.5: practice set and corrections • Day 2: Unit 2 test • Day 3: Lesson 3.1 Accrual versus Cash: From Voyages to Periods: video, teaching and worked examples • Day 4: Lesson 3.1: project and notebook • Day 5: Lesson 3.1: practice set and corrections
8	• Day 1: Lesson 3.2 Adjusting Entries: Franklin's Fire Insurance: video, teaching and worked examples • Day 2: Lesson 3.2: project and notebook • Day 3: Lesson 3.2: practice set and corrections • Day 4: Lesson 3.3 The Worksheet: Accountants' Spreadsheets: video, teaching and worked examples

WEEK	PLAN
	Day 5: Lesson 3.3: project and notebook
9	- Day 1: Lesson 3.3: practice set and corrections - Day 2: Lesson 3.4 Closing Entries: The Day of Reckoning: video, teaching and worked examples - Day 3: Lesson 3.4: project and notebook - Day 4: Lesson 3.4: practice set and corrections - Day 5: Lesson 3.5 The Full Cycle: Lincoln's Store and a Practice Set: video, teaching and worked examples
10	- Day 1: Lesson 3.5: project and notebook - Day 2: Lesson 3.5: practice set and corrections - Day 3: Unit 3 test - Day 4: Lesson 4.1 The Income Statement: Wedgwood Finds His Costs: video, teaching and worked examples - Day 5: Lesson 4.1: project and notebook
11	- Day 1: Lesson 4.1: practice set and corrections - Day 2: Lesson 4.2 The Statement of Owner's Equity: Franklin and Hall: video, teaching and worked examples - Day 3: Lesson 4.2: project and notebook - Day 4: Lesson 4.2: practice set and corrections - Day 5: Lesson 4.3 The Balance Sheet: The Bank of England Reports: video, teaching and worked examples
12	- Day 1: Lesson 4.3: project and notebook - Day 2: Lesson 4.3: practice set and corrections - Day 3: Lesson 4.4 The Statement of Cash Flows: Profitable and Broke: video, teaching and worked examples - Day 4: Lesson 4.4: project and notebook - Day 5: Lesson 4.4: practice set and corrections
13	- Day 1: Lesson 4.5 Reading a Real Annual Report: U.S. Steel to the 10-K: video, teaching and worked examples - Day 2: Lesson 4.5: project and notebook - Day 3: Lesson 4.5: practice set and corrections - Day 4: Unit 4 test

WEEK	PLAN
	Day 5: Lesson 5.1 Cash and the Bank Reconciliation: video, teaching and worked examples
14	- Day 1: Lesson 5.1: project and notebook - Day 2: Lesson 5.1: practice set and corrections - Day 3: Lesson 5.2 Petty Cash and the Incorruptible Cashier: video, teaching and worked examples - Day 4: Lesson 5.2: project and notebook - Day 5: Lesson 5.2: practice set and corrections
15	- Day 1: Lesson 5.3 Internal Control and Separation of Duties: video, teaching and worked examples - Day 2: Lesson 5.3: project and notebook - Day 3: Lesson 5.3: practice set and corrections - Day 4: Lesson 5.4 Fraud: Ivar Kreuger and the 1932 Collapse: video, teaching and worked examples - Day 5: Lesson 5.4: project and notebook
16	- Day 1: Lesson 5.4: practice set and corrections - Day 2: Lesson 5.5 Ethics and the Accountant's Vocation: video, teaching and worked examples - Day 3: Lesson 5.5: project and notebook - Day 4: Lesson 5.5: practice set and corrections - Day 5: Unit 5 test
17	- Day 1: Review day for the midterm - Day 2: Midterm exam - Day 3: Lesson 6.1 Accounts Receivable: Singer Sells on Credit: video, teaching and worked examples - Day 4: Lesson 6.1: project and notebook - Day 5: Lesson 6.1: practice set and corrections
18	- Day 1: Lesson 6.2 Bad Debts: The Medici and the King: video, teaching and worked examples - Day 2: Lesson 6.2: project and notebook - Day 3: Lesson 6.2: practice set and corrections - Day 4: Lesson 6.3 Inventory Systems: From the Counting Book to the Bar Code: video, teaching and worked examples

WEEK	PLAN
	Day 5: Lesson 6.3: project and notebook
19	- Day 1: Lesson 6.3: practice set and corrections - Day 2: Lesson 6.4 FIFO, LIFO and Average Cost: video, teaching and worked examples - Day 3: Lesson 6.4: project and notebook - Day 4: Lesson 6.4: practice set and corrections - Day 5: Lesson 6.5 Cost of Goods Sold and Gross Margin: Woolworth's Five and Ten: video, teaching and worked examples
20	- Day 1: Lesson 6.5: project and notebook - Day 2: Lesson 6.5: practice set and corrections - Day 3: Unit 6 test - Day 4: Lesson 7.1 Plant Assets and Straight-Line Depreciation: Arkwright's Mill: video, teaching and worked examples - Day 5: Lesson 7.1: project and notebook
21	- Day 1: Lesson 7.1: practice set and corrections - Day 2: Lesson 7.2 Declining-Balance and Units-of-Production Depreciation: video, teaching and worked examples - Day 3: Lesson 7.2: project and notebook - Day 4: Lesson 7.2: practice set and corrections - Day 5: Lesson 7.3 Notes and Interest: Fugger Lends to an Emperor: video, teaching and worked examples
22	- Day 1: Lesson 7.3: project and notebook - Day 2: Lesson 7.3: practice set and corrections - Day 3: Lesson 7.4 Payroll and Payroll Taxes: Ford's \$5 Day: video, teaching and worked examples - Day 4: Lesson 7.4: project and notebook - Day 5: Lesson 7.4: practice set and corrections
23	- Day 1: Lesson 7.5 Bonds and Leases, Simply: video, teaching and worked examples - Day 2: Lesson 7.5: project and notebook - Day 3: Lesson 7.5: practice set and corrections - Day 4: Unit 7 test - Day 5: Lesson 8.1 Partnerships: The Medici Model: video, teaching and worked examples
24	Day 1: Lesson 8.1: project and notebook

WEEK	PLAN
	• Day 2: Lesson 8.1: practice set and corrections • Day 3: Lesson 8.2 The Corporation: From the Dutch East India Company to Today: video, teaching and worked examples • Day 4: Lesson 8.2: project and notebook • Day 5: Lesson 8.2: practice set and corrections
25	• Day 1: Lesson 8.3 Stock: Issuing Shares from Buttonwood to Today: video, teaching and worked examples • Day 2: Lesson 8.3: project and notebook • Day 3: Lesson 8.3: practice set and corrections • Day 4: Lesson 8.4 Dividends and Retained Earnings: Ford versus the Dodge Brothers: video, teaching and worked examples • Day 5: Lesson 8.4: project and notebook
26	• Day 1: Lesson 8.4: practice set and corrections • Day 2: Lesson 8.5 Nonprofit and Church Accounting: George Müller's Reports: video, teaching and worked examples • Day 3: Lesson 8.5: project and notebook • Day 4: Lesson 8.5: practice set and corrections • Day 5: Unit 8 test
27	• Day 1: Lesson 9.1 Ratio Analysis: Liquidity and Solvency: video, teaching and worked examples • Day 2: Lesson 9.1: project and notebook • Day 3: Lesson 9.1: practice set and corrections • Day 4: Lesson 9.2 Profitability and the DuPont Formula: video, teaching and worked examples • Day 5: Lesson 9.2: project and notebook
28	• Day 1: Lesson 9.2: practice set and corrections • Day 2: Lesson 9.3 Auditing and the CPA: The McKesson & Robbins Case: video, teaching and worked examples • Day 3: Lesson 9.3: project and notebook • Day 4: Lesson 9.3: practice set and corrections • Day 5: Lesson 9.4 Enron, Arthur Andersen and the 2002 Reforms: video, teaching and worked examples
29	• Day 1: Lesson 9.4: project and notebook

WEEK	PLAN
	• Day 2: Lesson 9.4: practice set and corrections • Day 3: Lesson 9.5 Careers in Accounting: video, teaching and worked examples • Day 4: Lesson 9.5: project and notebook • Day 5: Lesson 9.5: practice set and corrections
30	• Day 1: Unit 9 test • Day 2: Lesson 10.1 Cost Behavior and Break-Even: Counting the Cost: video, teaching and worked examples • Day 3: Lesson 10.1: project and notebook • Day 4: Lesson 10.1: practice set and corrections • Day 5: Lesson 10.2 Job and Process Costing: Carnegie's Cost Sheets: video, teaching and worked examples
31	• Day 1: Lesson 10.2: project and notebook • Day 2: Lesson 10.2: practice set and corrections • Day 3: Lesson 10.3 Budgets: Joseph's Seven Years: video, teaching and worked examples • Day 4: Lesson 10.3: project and notebook • Day 5: Lesson 10.3: practice set and corrections
32	• Day 1: Lesson 10.4 Capital Decisions and Present Value: Franklin's 200-Year Gift: video, teaching and worked examples • Day 2: Lesson 10.4: project and notebook • Day 3: Lesson 10.4: practice set and corrections • Day 4: Lesson 10.5 Capstone: Milton Hershey and a Small Business's Books: video, teaching and worked examples • Day 5: Lesson 10.5: project and notebook
33	• Day 1: Lesson 10.5: practice set and corrections • Day 2: Unit 10 test • Day 3: Review day for the final • Day 4: Final exam

MATERIALS

A calculator

Any calculator with a percent key. A financial calculator is optional for Lesson 10.4; a spreadsheet does the same work.

A ledger notebook, or a binder of columnar ledger paper

Two-column and four-column journal and ledger paper can be printed free from many sites, or rule columns in a graph-paper notebook. Used every week.

Free spreadsheet software: Google Sheets or LibreOffice Calc

For rebuilding journals, trial balances, statements, depreciation schedules, budgets and present-value tables after doing them by hand.

Optional: GnuCash

Free, open-source double-entry accounting software (gnucash.org). Optional in Units 2, 3 and 10.

Pencils, an eraser for scratch work only, a ruler and file folders

Keep one folder for each unit's project records and source documents.

Real source documents, with a parent's permission

Store receipts, a bank statement with account numbers blacked out, a pay stub, a utility bill. Used in Units 2, 5 and 7.

Optional: one of the books or free resources listed in a unit

Never required. See the list in each unit.

GRADING

Grades come from the practice sets, the projects, the ledger notebook, the ten unit tests, the midterm and the final. A journal entry earns full credit when the accounts, the amounts and the explanation are all correct and the debits equal the credits. A statement earns full credit when it is properly headed, correctly classified and balances.

PART	%
Practice sets (completed and corrected)	15
Projects (complete, accurate, balanced books)	25
Ledger notebook (neat, dated, honest corrections)	10
Unit tests	30
Midterm exam	10

PART	%
Final exam	10

Scale: A 90–100, B 80–89, C 70–79, D 60–69, F below 60.

- Practice sets are graded for completion and correction, not first-try accuracy: a problem done, checked and correctly reworked earns full credit.
- On tests, give partial credit for correct accounts with a wrong amount, or a correct method with an arithmetic slip. An entry that does not balance earns at most half credit.
- A project earns full marks when the books are complete, the trial balance balances, the statements agree with the ledger, and every correction is made honestly (crossed out with one line and initialed, never erased).
- For a high-school transcript this course is one full credit of Accounting (a business elective, or a mathematics elective where the family or school allows). Keep the ledger notebook and the capstone books as the portfolio record.

A NOTE TO PARENTS

You do not need to be an accountant to supervise this course. Your jobs are to keep the rhythm (three sessions per lesson), check the practice sets against the answers, and look at the books at the end of each unit. The best question you can ask is “Does it balance, and how do you know?” A student who can trace a number from the source document to the journal, the ledger, the trial balance and the statement is learning accounting.

Several projects work best with real records: a family purchase, a bank statement, a pay stub, a small business or a church’s published report. Share only what you are comfortable sharing, black out account numbers, and keep these papers at home. The course never asks the student to open an account, sign anything or handle anyone else’s money without you.

The course tells the history of accounting honestly, including its great frauds, because they teach why honest books matter. It treats laws such as the securities acts of 1933–34 and the reforms of 2002 as settled history: what problem they addressed and how they work. Above all, it hopes to form a young person who can be trusted

with the books, “faithful in that which is least” (Luke 16:10). *Fabricando fit faber*: by keeping books, one becomes a bookkeeper.

UNIT 1

THE LANGUAGE OF BUSINESS

Accounting is called the language of business because owners, lenders, investors, managers and tax authorities all read the same reports. This unit teaches the grammar of that language through the people who first wrote it down: the merchants and city treasurers of Genoa, Florence and Venice, Francesco Datini of Prato with his 500 account books, Luca Pacioli with his printed *Summa* of 1494, and Jakob Fugger's accountant Matthäus Schwarz with his cabinet of labeled drawers.

You will learn the accounting equation ($\text{assets} = \text{liabilities} + \text{owner's equity}$), the double-entry idea that every transaction has two equal sides, and the chart of accounts that organizes every business's ledger. The unit ends with why honest books matter, to each of the six stakeholders and before God: "Be thou diligent to know the state of thy flocks" (Proverbs 27:23).

PREREQUISITES

- Algebra I: solving one-step and two-step equations
- Working with percents and decimals
- Adding columns of numbers accurately by hand and with a calculator

MASTERY CHECKLIST

- ☐ I can tell how Italian merchants developed double entry and how Pacioli's

Su (1494) spread it.

m

m

a

- ☐ I can analyze any simple transaction for its effect on assets, liabilities and equity, and keep the accounting equation in balance.
- ☐ I can record transactions as equal debits and credits in T-accounts, including compound entries.
- ☐ I can design and number a chart of accounts in financial-statement order.
- ☐ I can explain who uses financial statements and why the entity, cost, going-concern and periodicity principles make them trustworthy.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Principles of Accounting, Volume 1: Financial Accounting (OpenStax, Rice University)**: A free, complete college textbook online or as a PDF. Use it as a reference all year; Chapters 1–3 match this unit. Ages 15 and up.
- **GnuCash**: Free, open-source double-entry accounting software for Windows, Mac and Linux. Optional. In Lesson 1.4, create a new book and compare its sample chart of accounts with yours. Install with a parent.
- **Ancient Double-Entry Bookkeeping, by John B. Geijsbeek (1914)**: Free on the Internet Archive. An English translation of Pacioli’s bookkeeping chapters with the Italian facing. Read a few pages of Pacioli’s own instructions with Lesson 1.1. Ages 15 and up.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

1.1	Pacioli and the Merchants of Venice	3 sessions of 50 minutes
1.2	The Accounting Equation	3 sessions of 50 minutes
1.3	The Double-Entry Idea: Datini of Prato	3 sessions of 50 minutes
1.4	The Chart of Accounts: Fugger’s Counting Room	3 sessions of 50 minutes
1.5	Why Honest Books Matter	3 sessions of 50 minutes

UNIT 1 TEST

Calculators are allowed. Show your work for every calculation: write the equation or the entry, then the numbers. Every entry must have equal debits and credits. Answer the concept questions in complete sentences. The test is worth 100 points.

1. **5 pts**

What did Luca Pacioli publish in 1494, and what was his contribution to accounting?

2. **5 pts**

Name Pacioli's three books and the inventory that opens them.

3. **6 pts**

A merchant owns cash \$3,000, goods \$7,500 and a wagon \$1,200, and is owed \$800. He owes a bank \$4,000 and a supplier \$1,100. Find his capital and write the check line.

4. **6 pts**

Classify each as asset, liability, equity, revenue or expense: Notes Payable; Supplies; Fees Earned; Owner's Capital; Wages Expense; Accounts Receivable.

5. **8 pts**

Show the effect on assets, liabilities and equity: (a) owner invests \$5,000; (b) buys equipment \$2,000 on account; (c) earns \$900 cash fees; (d) pays \$300 wages.

6. **8 pts**

After the four transactions in Problem 5 (starting from zero), find total assets, liabilities and equity and prove the equation.

7. **6 pts**

Beginning equity \$20,000; owner investment \$4,000; revenue \$31,000; expenses \$24,500; withdrawals \$6,000. Find net income and ending equity.

8. **6 pts**

Write the entry: a machine costing \$9,000 is bought with \$2,500 cash and a note for the rest.

9. **8 pts**

Post to T-accounts and find the balances: owner invests \$6,000 cash; buys supplies \$700 on account; pays \$1,800 cash for equipment; pays \$400 on account. Prove that debit balances equal credit balances.

10. **5 pts**

Explain duality and why double entry lets the books check themselves.

11. **5 pts**

Give an example of an error that double entry will not catch.

12. **6 pts**

Number these accounts in a chart (100s–500s): Rent Expense, Cash, Owner Drawing, Service Revenue, Equipment, Accounts Payable, Owner Capital, Accounts Receivable.

13. **4 pts**

Which of the accounts in Problem 12 are temporary?

14. **6 pts**

Name the principle: (a) land stays at \$40,000 though it could sell for \$55,000; (b) the owner's personal phone bill is kept out of the business books; (c) profit is reported every year.

15. **6 pts**

A business reports net income of \$15,000. It recorded the owner's \$2,000 family vacation as travel expense and omitted \$700 of business supplies paid personally. Correct net income?

16. **10 pts**

Essay (one or two paragraphs): Using at least four of the six stakeholders, explain why honest books matter, and connect your answer to Proverbs 27:23 or to Datini, Fugger or Rembrandt's syndics.

ANSWER KEY

1. The *Summa de arithmetica*, printed in Venice. It contained a clear explanation of the Venetian method of double-entry bookkeeping; he did not invent it, but his printed account spread it across Europe.
2. The inventory lists everything owned and owed; then the memorandum (rough notes), journal (dated entries with debit and credit) and ledger (one page per account).
3. Owned \$12,500; owed \$5,100; capital \$7,400. Check: $12,500 = 5,100 + 7,400$.
4. Liability; asset; revenue; equity; expense; asset.
5. (a) A +5,000, E +5,000 (b) A +2,000, L +2,000 (c) A +900, E +900 (d) A -300, E -300.
6. Assets: cash $5,000 + 900 - 300 = 5,600$ plus equipment $2,000 = \$7,600$. Liabilities \$2,000. Equity $5,000 + 900 - 300 = \$5,600$. $7,600 = 2,000 + 5,600$.
7. Net income = $31,000 - 24,500 = \$6,500$. Ending equity = $20,000 + 4,000 + 6,500 - 6,000 = \$24,500$.
8. Debit Equipment \$9,000; credit Cash \$2,500; credit Notes Payable \$6,500.
9. Cash $6,000 - 1,800 - 400 = \$3,800$ Dr; Supplies \$700 Dr; Equipment \$1,800 Dr; Accounts Payable $700 - 400 = \$300$ Cr; Capital \$6,000 Cr. Debits 6,300 = credits 6,300.
10. Every transaction has two equal sides; recording both as a debit and a credit makes total debits equal total credits, so an unequal total reveals an error.
11. Recording the wrong amount on both sides (for example \$500 as \$50 in both accounts), or debiting the wrong account of the same type.
12. 101 Cash; 111 Accounts Receivable; 181 Equipment; 201 Accounts Payable; 301 Capital; 302 Drawing; 401 Service Revenue; 511 Rent Expense.
13. Owner Drawing, Service Revenue, Rent Expense.
14. (a) cost principle (b) business entity (c) periodicity.
15. $15,000 + 2,000 - 700 = \$16,300$.
16. A strong answer names at least four stakeholders and what each needs (for example, lenders deciding to lend, owners deciding to expand, workers' job security, customers' warranties, taxes for the community), explains the harm false books would do, and ties the idea of knowing the true state of one's affairs to the verse or to one of the historical examples.

PORTFOLIO PIECE: THE OPENING BOOKS OF A SMALL BUSINESS

Choose a small business (real, with a parent's help, or realistic) and open its books. Write an opening inventory, a numbered chart of accounts with at least 12 accounts, and twelve transactions for its first month. Record them in an accounting-equation table and in T-accounts, prove the equation and the equality of debits and credits, and write a one-page letter to a banker explaining the business's position at month-end and why the banker can trust your records.

LOOK FOR	WHAT IT MEANS
Chart of accounts	At least 12 accounts, correctly classified, numbered in order with gaps, and marked permanent or temporary.
Transactions	Twelve realistic transactions, including an investment, a credit purchase, a credit sale, a compound entry and a withdrawal.
Balance	The equation balances after every line, and T-account debit balances equal credit balances.
Letter to a banker	Explains assets, liabilities, equity and net income in plain words and names at least two principles that make the records trustworthy.

1.1 PACIOLI AND THE MERCHANTS OF VENICE

OBJECTIVES

- Tell how Venetian and Florentine merchants developed double-entry bookkeeping and how Luca Pacioli's *Summa de arithmetica* (Venice, 1494) spread it across Europe.
- Describe Pacioli's opening inventory and his three books: the memorandum, the journal and the ledger.
- Compute a merchant's capital from an inventory of what he owns and owes.

Warm-up. List everything you own that has money value (cash, a bicycle, a phone, books, tools) with a rough value for each, then list anything you owe anyone. Subtract. That number is, in Pacioli's language, your capital. How sure are you of each value? Which items were hardest to price?

WATCH

History of accounting

The Finance Storyteller • 4:05

<https://www.youtube.com/watch?v=HAL0sBd9oyg>

WHEN TO WATCH

After the story and before the worked examples. Pause when Pacioli appears and compare the video's dates with the lesson.

BACKUP VIDEO

The Birth of Modern Business | Luca-Pacioli's 'Summa de Arithmetica' | Christie's Christie's • 2:12

<https://www.youtube.com/watch?v=qGEOHCXLJrI>

A two-minute look at a surviving first edition of the *Summa*, after the history note.

KEY TERMS

accounting

The system of recording, classifying, summarizing and reporting the financial activity of a business, so that owners and others can make decisions. Bookkeeping is the recording part; accounting includes the analysis and the reports.

inventory (Pacioli's sense)

A complete written list, made when the books are opened, of everything a merchant owns and owes, each with a money value.

capital

What remains for the owner when everything owed to others is subtracted from everything owned. Today it is called owner's equity.

double-entry bookkeeping

The method in which every transaction is recorded in at least two accounts, with equal debits and credits, so that the books check themselves.

memorandum, journal, ledger

Pacioli's three books: a rough daybook of events as they happen; a neat, dated record of each transaction showing its debit and credit; and a book with one page (account) for each item, to which the journal is posted.

CORE IDEAS

The story. By 1300 the merchants of Venice, Genoa and Florence traded spices, silk, wool and silver from the Black Sea to Flanders, often through partners and agents they rarely saw. A merchant might have goods on three ships, money owed to him by a dozen customers and loans from two banks. Memory was not enough. The oldest surviving complete set of double-entry books is the ledger kept by the treasurers of the city of Genoa for 1340, and Florentine firms used the method in the same century. In 1494 a Franciscan friar and mathematics teacher, Luca Pacioli (about 1447–1517), born in Sansepolcro, published in Venice a huge textbook, the *Summa de arithmetica, geometria, proportioni et proportionalita*. One section, *Particularis de computis et scripturis* (“Details of accounts and records”), explained the “method of Venice” step by step.

How they figured it out. Pacioli had lived the problem. As a young man he tutored the sons of the Venetian merchant Antonio Rompiasi and watched the family keep its books. He wrote that a merchant needs three things: cash or credit, a good bookkeeper, and a system that lets him see his affairs “at a glance.” His system began with an **inventory**: on the first day, list everything owned and everything owed, item by item, with a value. Then keep three books. In the **memorandum** the merchant or his clerk jotted each event as it happened. In the **journal** each event was written neatly, in date order, naming the account debited and the account credited. Then each journal entry was posted to the **ledger**, where every account had its own page with a debit side on the left and a credit side on the right. At the end, the debit totals had to equal the credit totals; if they did not, there was an error to find. Pacioli did not invent the method, but the printing press made his clear explanation available to anyone, and it was translated and copied across Europe for two centuries.

The big idea. Accounting answers two questions for any business: *What do I own and owe right now?* and *Did I gain or lose over this period, and why?* Pacioli’s opening inventory answers the first: capital equals everything owned minus everything owed. The journal and ledger then track every change, so the merchant can answer both questions at any time. Every page was dated, every number had a source, and every entry had two sides. Those three habits are still the foundation of the subject.

In business today. Computer accounting programs still use Pacioli’s structure: a source document (a receipt, invoice or bank record) plays the part of the memorandum; the program records a journal entry; it posts automatically to ledger accounts; and it prepares a trial balance and statements. Accounting is often called “the language of business,” because owners, lenders, investors, tax authorities and managers all read the same reports. Learning it lets you understand any business, from a lemonade stand to a railroad, and keep honest books for your own family, church or company.

Think it through. Pacioli advised merchants to begin their books “in the name of God,” and many Italian ledgers open with a cross and those words. To an honest merchant, keeping exact accounts was part of dealing justly with partners and customers, and of being able to give an account of his stewardship.

PICTURE STUDY



Portrait of Luca Pacioli, Attributed to Jacopo de' Barbari, about 1495 · Oil on panel · Museo di Capodimonte, Naples

Image: [Wikimedia Commons](#), public domain

This portrait was painted about a year after the *Summa* appeared. Pacioli is shown teaching geometry from Euclid; the closed red book on the table is often thought to be his own *Summa*. The young man behind him has never been identified for certain.

Look closely

- Find Pacioli's hands. One points at a drawing on the slate, the other at a book. What is he doing?
- Find every instrument on the table: compass, chalk, a sponge, a wooden solid. Which would a teacher of merchants' arithmetic also need?
- Look at the glass solid hanging in the air. What is reflected in it?
- Find the book that may be the *Summa*. Where is it placed in the picture?

Talk about it

1. Why would a mathematician write a chapter on merchants' books?
2. The painting shows careful order and exact measurement. How are those also virtues in bookkeeping?

3. Pacioli is painted as a teacher. Why did his teaching matter more than inventing something new?

PROJECT

Open a Merchant's Books with an Inventory

You will open a set of books the way Pacioli taught: with a dated inventory, then a memorandum of events, and a capital figure that you can check.

You will need

- Ledger notebook
- Pencil, ruler and calculator
- A family business, a club treasury or your own possessions (with a parent's permission), or the sample merchant in the steps

Steps

1. Choose your “merchant”: yourself, a club treasury, or a family business with a parent's permission. If none fits, use this sample: a market gardener with cash \$350, seeds and tools worth \$420, a garden cart worth \$180, \$60 owed by a neighbor, and \$120 owed to a feed store.
2. At the top of a fresh notebook page write the date and, as Pacioli did, a heading: “Inventory of ...”.
3. List every item owned, one per line, with a value and a note on how you chose the value (receipt, price check, estimate).
4. List every amount owed to others, one per line, with the name of the person or firm.
5. Total each list and compute capital = owned – owed. Write the check line: owned = owed + capital.
6. For one week, keep a memorandum page: every money event, jotted the moment it happens (date, who, what, how much).
7. At the end of the week, sort each memorandum note: what was received and what was given? Write each as a two-sided line, for example “Cash received \$15 / Sales \$15.”
8. Write a new inventory at the end of the week and compute capital again. Explain the change from the memorandum notes.

9. Write three sentences: Which values were hardest to set? Which events nearly went unrecorded? What would a merchant with three ships at sea need that you did not?

Tips

- Values should be honest, not hopeful. If you are not sure, use what you paid or a cautious estimate, and say so.
- Never erase in the notebook. Cross out with one line, correct and initial.

Check your work

- ☐ My opening inventory lists every item owned and owed, with values and sources.
- ☐ My capital is computed correctly, and owned = owed + capital.
- ☐ I can explain the change in capital over the week from my memorandum.

LEDGER NOTEBOOK

1. Draw Pacioli's three books side by side and show one transaction traveling from memorandum to journal to ledger.
2. Make a timeline: 1340 Genoa's treasurers' ledger; 1494 the *Summa*; 1500s translations into Dutch and English; today, accounting software.
3. Copy the inventory from Worked Example 1 in your own hand, with the check line.

KEY FORMULAS

Capital = Everything owned – Everything owed

From history. Pacioli later taught mathematics in Milan, where he became a friend of Leonardo da Vinci, who drew the geometric solids for Pacioli's book *De divina proportione* (printed 1509). The earliest English bookkeeping book, Hugh Oldcastle's of 1543, is lost; its 1588 revision by John Mellis follows Pacioli closely.

WORKED EXAMPLES

Example 1. A Venetian merchant opens new books with this inventory: cash 2,000 ducats; pepper in his warehouse worth 600 ducats; wool cloth worth 1,400 ducats; a share of a ship worth 900 ducats; 500 ducats owed to him by a customer in Bruges. He owes 1,100 ducats to a bank and 300 ducats to a supplier of cloth. What is his capital?

Show solution

1. List what he owns: $2,000 + 600 + 1,400 + 900 + 500 = 5,400$ ducats.
2. List what he owes: $1,100 + 300 = 1,400$ ducats.
3. Capital = owned – owed = $5,400 - 1,400 = 4,000$ ducats.
4. Check: owned (5,400) = owed (1,400) + capital (4,000). The two sides balance.

Answer: His capital is 4,000 ducats.

Example 2. During one voyage the same merchant buys 800 ducats of pepper for cash, pays 90 ducats for freight and duties, and sells all the pepper in Flanders for 1,150 ducats cash. By how much did his capital change, and how did his cash change?

Show solution

1. Gain on the voyage = sales – cost of pepper – freight and duties = $1,150 - 800 - 90 = 260$ ducats.
2. Cash: $-800 - 90 + 1,150 = +260$ ducats.
3. Capital rises by the gain, 260 ducats, from 4,000 to 4,260 ducats.

Answer: Capital rose 260 ducats, and so did cash, because every part of this voyage was paid in cash.

Example 3. Sort these items into the book where Pacioli would first write them: (a) a rough note at the quay, “bought 10 bales of cotton from Ser Marco, to pay at Easter”; (b) a neat dated entry, “Cotton is debited, Ser Marco is credited, 240 ducats”; (c) a page headed “Ser Marco” with all amounts owed to him.

Show solution

1. (a) is a note made as the event happens: the memorandum.
2. (b) names the debit and the credit in date order: the journal.
3. (c) collects every entry for one account on its own page: the ledger.

Answer: Memorandum, journal, ledger.

PRACTICE

1. **Easy** In what city and year was Pacioli’s *Summa de arithmetica* published?

Show answer

Venice, 1494.

2. **Easy** Did Pacioli invent double-entry bookkeeping? Explain in one sentence.

Show answer

No. Italian merchants and city treasurers used it from at least the 1300s; Pacioli explained it clearly in print, which spread it.

3. **Easy** Name Pacioli’s three books and what goes in each.

Show answer

Memorandum (rough notes of events), journal (dated entries naming debit and credit), ledger (a page for each account, posted from the journal).

4. **Medium** A shopkeeper owns cash \$1,200, goods for sale \$3,400 and a delivery cart \$900, and is owed \$300 by customers. She owes \$1,500 to a supplier. Find her capital.

Show answer

Owned \$5,800 – owed \$1,500 = \$4,300.

5. **Medium** A merchant's capital is 2,500 ducats and he owes 700 ducats. How much does he own?

Show answer

$2,500 + 700 = 3,200$ ducats.

6. **Medium** A trader starts with capital of 3,000 florins. He buys silk for 1,200 florins, pays 150 florins in transport, and sells the silk for 1,610 florins, all in cash. What is his new capital?

Show answer

Gain = $1,610 - 1,200 - 150 = 260$; capital 3,260 florins.

7. **Medium** Why did Pacioli insist that the books begin with a full inventory?

Show answer

Without a complete starting list of what is owned and owed, later records cannot show the true capital or whether the business gained or lost.

8. **Hard** A merchant lists: cash 400; goods 2,100; owed to him 650; owed by him to a bank 1,800; owed to a supplier 450. A clerk forgot to list a ship share worth 1,000. What capital does the incomplete inventory show, and what is the true capital?

Show answer

Incomplete: $3,150 - 2,250 = 900$. True: $4,150 - 2,250 = 1,900$. The omission understates capital by 1,000.

9. **Hard** How did the printing press matter to the history of accounting?

Show answer

It made hundreds of copies of Pacioli's clear explanation, so merchants all over Europe could learn the Venetian method from a book rather than only by apprenticeship.

10. **Hard** A merchant's capital went from 4,000 to 3,700 ducats in a year in which he took nothing out and put nothing in. What must have happened?

Show answer

The business lost 300 ducats: expenses and losses exceeded gains by 300.

11. **Challenge** Pacioli said a merchant should see his affairs “at a glance.” Give two questions a merchant could answer at a glance with well-kept books that he could not answer from memory alone.

Show answer

Sample: How much does each customer owe me, and since when? Which voyages or goods made or lost money this year? What is my capital today?

COMMON MISTAKES

- Saying Pacioli invented double entry. He explained and spread a method already in use.
- Leaving items out of an inventory. An incomplete list gives a wrong capital, too high or too low.
- Confusing capital with cash. Capital is owned minus owed; cash is only one thing owned.

Make it a game • Pacioli Inventory Dash. Open a merchant's books Pacioli style. In three minutes, list at least ten household items with a value for each, grouped as a Venetian merchant would, then total your capital. Your parent then names each of the three books of Pacioli's system, and you give its job in one sentence. Beat your personal record for items listed next round.

Scripture. “Let all things be done decently and in order.” (1 Corinthians 14:40, KJV)

Paul wrote this about worship, but it describes good books too: every transaction recorded in order, with nothing hidden or left out.

1.2 THE ACCOUNTING EQUATION

OBJECTIVES

- State the accounting equation, $\text{assets} = \text{liabilities} + \text{owner's equity}$, and explain each part.
- Analyze transactions for their effect on the equation and show that it stays in balance.
- Use the expanded equation to show how investments, revenue, expenses and withdrawals change owner's equity.

Warm-up. A family buys a \$24,000 car with \$4,000 down and a \$20,000 loan. Did the family become richer, poorer or neither on the day it bought the car? Write your answer and a reason before you read on.

WATCH

The ACCOUNTING EQUATION For BEGINNERS

Accounting Stuff • 4:57

<https://www.youtube.com/watch?v=56xscQ4viWE>

WHEN TO WATCH

After the big idea and before the worked examples.

BACKUP VIDEO

The Basic Accounting Equation

Edspira • 6:33

<https://www.youtube.com/watch?v=CLG7K6Sq9K4>

Before the practice set, for a second explanation with different examples.

KEY TERMS

asset

Something of value the business owns or controls that will bring future benefit: cash, money owed by customers (accounts receivable), supplies, inventory, equipment, buildings, land.

liability

A debt or obligation the business owes to others: accounts payable to suppliers, notes payable to banks, wages owed, taxes owed.

owner's equity

The owner's claim on the assets after liabilities are paid: assets – liabilities. It rises with owner investments and revenue, and falls with withdrawals and expenses.

transaction

An event that changes the assets, liabilities or equity of a business and can be measured in money.

revenue and expense

Revenue is the value earned by providing goods or services to customers; an expense is the cost of assets used up or services consumed to earn revenue.

drawing (withdrawal)

Cash or other assets the owner takes out of the business for personal use. It reduces equity but is not an expense.

CORE IDEAS

The story. Pacioli's merchant began his books with an inventory: everything owned, everything owed, and the difference, his capital. Four hundred years later the same idea was written as an equation. As businesses grew larger in the 1800s and borrowed from banks and investors, lenders wanted to know not just what a business owned but who had a claim on it. American textbooks around 1900 began teaching the "proprietorship" equation, and by the middle of the 1900s every course began with it: **assets = liabilities + owner's equity**.

How they figured it out. Think of every asset as having a claim on it. If a shop owns \$10,000 of goods and owes the supplier \$6,000, the supplier has a claim on \$6,000 of those goods and the owner on the other \$4,000. Creditors' claims are liabilities; the owner's claim is equity. Because every asset belongs to someone, the two sides must be equal. That is why a business's report of its position is called a *balance* sheet.

The big idea. Every transaction changes at least two things, and the equation always stays balanced. Buying equipment for cash swaps one asset for another (Cash –, Equipment +). Buying supplies on credit raises an asset and a liability together. An owner investing cash raises an asset and equity. Earning revenue raises assets and equity; paying an expense lowers assets and equity. The **expanded equation** shows the parts of equity: $A = L + \text{Capital} - \text{Drawing} + \text{Revenue} - \text{Expenses}$. Profit (net income) is revenue minus expenses, and it belongs to the owner.

In business today. Lenders look at the equation before making a loan: a business with large liabilities and little equity has little cushion if sales fall. Owners watch equity grow as the business earns income and keeps it. Every balance sheet published by every company, church or charity is the accounting equation laid out in detail. The warm-up car purchase shows the key point: borrowing to buy an asset does not make you richer or poorer on that day; it raises assets and liabilities together.

Try it. In the project you will track a new business through its first month, transaction by transaction, and check after every line that the equation still balances.

PICTURE STUDY



Portrait of a Merchant, Jan Gossaert, about 1530 · Oil on panel · National Gallery of Art, Washington

Image: [Wikimedia Commons](#), public domain

Gossaert painted this merchant, probably in Antwerp, at his desk among the tools of his trade. The papers hanging behind him are bundles of letters and accounts, filed so that he could find who owed him and whom he owed.

Look closely

- Find the bundles of papers on the wall. What do you think is in them?
- Find the quill and the book. Is he writing or reading?
- Look for a scale or weights. Why would a merchant need them?
- Look at his face. What does the painter want you to think about this man?

Talk about it

1. Which things in the picture are assets of his business? Which papers might record liabilities?
2. If you could read the bundles, how would you find his capital?
3. Why might a merchant want his portrait painted with his business papers rather than in his finest clothes alone?

PROJECT

A Month of Transactions in the Equation

You will track a small new business through its first month in an accounting-equation table, checking the balance after every transaction.

You will need

- Ledger notebook or spreadsheet
- Calculator

Steps

1. Rule a table with columns: No., Description, Cash, Accounts Receivable, Supplies, Equipment, = , Accounts Payable, Capital, Drawing, Revenue, Expenses.
2. Record these transactions for Lane Tutoring, owned by Grace Lane: (1) invests \$2,500 cash; (2) buys a laptop (equipment) for \$900 cash; (3) buys \$180 of supplies on account; (4) tutors for cash, \$650; (5) tutors a family on account, \$300; (6) pays \$120 for advertising; (7) pays \$100 of the supplies bill; (8) collects \$200 from the family; (9) withdraws \$250.
3. After each line, total the assets and the liabilities plus equity and confirm they are equal.
4. Find the ending balance of each column.
5. Compute net income (revenue – expenses) and ending equity (capital – drawing + revenue – expenses).
6. Prove the final equation: total assets = liabilities + equity.
7. Rebuild the table in a spreadsheet with a check column that computes assets – (liabilities + equity) on every row. It should show 0 on every row.
8. Write two sentences on what the numbers show about Lane Tutoring's first month.

Tips

- Ask two questions about every transaction: what did the business receive, and what did it give up or promise?

- Revenue and expenses go in equity columns, not in cash, even though cash often moves at the same time.

Check your work

- ☐ My table balances after every line.
- ☐ Ending balances: Cash \$1,980; Accounts Receivable \$100; Supplies \$180; Equipment \$900 (assets \$3,160); Accounts Payable \$80; equity \$3,080.
- ☐ I can explain why borrowing or buying on credit does not change equity.

LEDGER NOTEBOOK

1. Draw the accounting equation as a balance scale with assets on one pan and liabilities plus equity on the other.
2. Copy the Hart Bicycle Repair table from Worked Example 2 with the final check line.
3. Write the expanded equation and give one transaction that changes each part of equity.

KEY FORMULAS

Assets = Liabilities + Owner's Equity

$A = L + \text{Capital} - \text{Drawing} + \text{Revenue} - \text{Expenses}$

Net income = Revenue – Expenses

From history. The word “balance” comes from the Latin *bilanx*, a scale with two pans. Merchants spoke of “balancing” their books centuries before the balance sheet had its modern form.

WORKED EXAMPLES

Example 1. Daniel Hart opens Hart Bicycle Repair. Show the effect of each transaction on the equation and the totals after each: (1) Daniel invests \$8,000 cash. (2) He buys tools and a work stand (equipment) for \$3,000 cash. (3) He buys \$600 of supplies on account.

Show solution

1. (1) Cash +\$8,000; Capital +\$8,000. Assets \$8,000 = Liabilities \$0 + Equity \$8,000.
 2. (2) Cash -\$3,000; Equipment +\$3,000. One asset is traded for another. Assets are still \$8,000 (Cash \$5,000 + Equipment \$3,000) = \$0 + \$8,000.
 3. (3) Supplies +\$600; Accounts Payable +\$600. Assets \$8,600 = Liabilities \$600 + Equity \$8,000.
-

Answer: After three transactions: assets \$8,600 = liabilities \$600 + equity \$8,000.

Example 2. Continue Hart Bicycle Repair: (4) repairs for cash, \$1,200; (5) repairs for a customer on account, \$400; (6) pays rent, \$700; (7) pays \$350 of the amount owed for supplies; (8) collects \$250 from the customer in (5); (9) Daniel withdraws \$500 for personal use. Find each account's balance and prove the equation.

Show solution

1. (4) Cash +\$1,200; Revenue +\$1,200.
2. (5) Accounts Receivable +\$400; Revenue +\$400.
3. (6) Cash -\$700; Rent Expense +\$700 (equity falls).
4. (7) Cash -\$350; Accounts Payable -\$350.
5. (8) Cash +\$250; Accounts Receivable -\$250. One asset becomes another; revenue was already counted in (5).
6. (9) Cash -\$500; Drawing +\$500 (equity falls, but it is not an expense).
7. Cash: $8,000 - 3,000 + 1,200 - 700 - 350 + 250 - 500 = \$4,900$. Accounts Receivable: $400 - 250 = \$150$. Supplies \$600. Equipment \$3,000. Total assets \$8,650.
8. Accounts Payable: $600 - 350 = \$250$.
9. Equity: Capital 8,000 - Drawing 500 + Revenue 1,600 - Expenses 700 = \$8,400.
10. Check: $\$250 + \$8,400 = \$8,650 = \text{total assets}$.

Answer: Assets \$8,650 = liabilities \$250 + equity \$8,400. Net income for the period is $\$1,600 - \$700 = \$900$.

Example 3. A business has assets of \$52,000 and liabilities of \$19,500 at the start of the year. During the year the owner invests \$5,000, withdraws \$12,000, and the business earns net income of \$16,000. Liabilities at year-end are \$21,000. What are equity and total assets at year-end?

Show solution

1. Beginning equity = $52,000 - 19,500 = \$32,500$.
2. Ending equity = $32,500 + 5,000 - 12,000 + 16,000 = \$41,500$.
3. Ending assets = liabilities + equity = $21,000 + 41,500 = \$62,500$.

Answer: Ending equity \$41,500; ending assets \$62,500.

PRACTICE

1. **Easy** Classify each as an asset, liability or equity: (a) cash; (b) a bank loan; (c) a delivery van; (d) the owner's investment; (e) money owed to a supplier; (f) money customers owe the business.

Show answer

(a) asset (b) liability (c) asset (d) equity (e) liability (f) asset.

2. **Easy** Assets are \$40,000 and liabilities \$15,000. What is owner's equity?

Show answer

\$25,000.

3. **Easy** Equity is \$18,000 and liabilities \$7,000. What are total assets?

Show answer

\$25,000.

4. **Medium** Which two parts of the equation change, and in which direction, when a business (a) buys supplies on account, (b) pays a supplier, (c) receives cash for services, (d) buys equipment for cash?

Show answer

(a) assets +, liabilities + (b) assets –, liabilities – (c) assets +, equity + (d) one asset +, another asset –.

5. **Medium** A business earns revenue of \$9,400 and has expenses of \$6,150 for the month. What is net income, and how does it affect equity?

Show answer

Net income \$3,250; equity rises \$3,250.

6. **Medium** Explain why an owner's withdrawal reduces equity but is not an expense.

Show answer

Expenses are costs of earning revenue. A withdrawal is the owner taking assets for personal use; it reduces the owner's claim but did not help earn revenue.

7. **Medium** Beginning equity \$14,000; owner investment \$2,000; net loss \$1,500; withdrawals \$3,000. Ending equity?

Show answer

$$14,000 + 2,000 - 1,500 - 3,000 = \$11,500.$$

8. **Hard** Back to the warm-up: a family buys a \$24,000 car with \$4,000 cash and a \$20,000 loan. Show the change in assets, liabilities and equity.

Show answer

Cash -\$4,000, car +\$24,000: assets +\$20,000; loan +\$20,000: liabilities +\$20,000; equity unchanged.

9. **Hard** A firm's assets rose \$30,000 during the year and liabilities fell \$5,000. The owner invested nothing and withdrew \$20,000. What was net income?

Show answer

Equity change = $+30,000 - (-5,000) = +35,000$. Net income - 20,000 = 35,000, so net income = \$55,000.

10. **Hard** In Worked Example 2, why does collecting \$250 from a customer not increase revenue?

Show answer

Revenue was recorded when the work was done in (5). Collection simply changes accounts receivable into cash.

11. **Challenge** Assets \$90,000 at the start and \$105,000 at the end of the year; liabilities \$35,000 at the start and \$41,000 at the end. The owner invested \$10,000 and net income was \$22,000. How much did the owner withdraw?

Show answer

Equity start 55,000, end 64,000. $55,000 + 10,000 + 22,000 - W = 64,000$, so $W = \$23,000$.

COMMON MISTAKES

- Recording revenue when cash is collected from a customer who was already billed. The revenue was earned when the work was done.
- Treating a withdrawal as an expense. It reduces equity but is not a cost of earning revenue.
- Forgetting that buying on credit raises a liability.

Make it a game • Equation Duel. Your parent calls a transaction, such as an owner invests cash, a supply is bought on credit, or a customer pays a bill. You have ten seconds to state its effect on assets, liabilities and owner's equity, and confirm the equation still balances. Each correct answer builds your streak. A wrong answer resets it. Aim for a streak of twelve.

1.3 THE DOUBLE-ENTRY IDEA: DATINI OF PRATO

OBJECTIVES

- Explain duality: every transaction has at least two equal effects, and double entry records both.
- Tell how the account books of Francesco Datini of Prato show double entry at work in the 1300s.
- Record simple and compound transactions as two-sided entries in T-accounts and check that total debits equal total credits.

Warm-up. Think of three things that happened with money in your house this week. For each, name what was received and what was given (for example, “groceries received, cash given”). Did any event have only one side?

WATCH

DOUBLE-ENTRY ACCOUNTING: Explained in (Almost) 2 Minutes!

Accounting Stuff · 3:30

<https://www.youtube.com/watch?v=cjO8qHM5Wjg>

WHEN TO WATCH

After the big idea, before the worked examples.

BACKUP VIDEO

How to Determine the Effect of Transactions on the Basic Accounting Equation

Wiley · 3:41

https://www.youtube.com/watch?v=o9-Sh_6EmkA

With the worked examples, as a second walk-through of transaction effects.

KEY TERMS

duality

The principle that every transaction has two sides of equal value: something received and something given, or a resource and a claim on it.

account

A record of the increases and decreases in one item, such as Cash, Equipment or Accounts Payable.

T-account

A simple sketch of an account shaped like a T, with the account title on top, debits on the left and credits on the right.

debit (Dr) and credit (Cr)

The left side and the right side of an account. Every entry has equal debits and credits. Which side means increase depends on the kind of account (Lesson 2.1).

compound entry

A journal entry that affects three or more accounts, still with total debits equal to total credits.

CORE IDEAS

The story. Francesco di Marco Datini (about 1335–1410) was the son of a tavern keeper in Prato, near Florence. Orphaned by the plague of 1348, he went to Avignon as a teenager, made his fortune trading armor, cloth and goods of every kind, and came home to build a network of companies in Prato, Florence, Pisa, Genoa, Barcelona, Valencia and Majorca. When he died he left his fortune to a charity for the poor of Prato and, by luck, his papers stayed in his house: about 500 account books and some 150,000 letters, the largest business archive of the Middle Ages. Many of his ledgers open with the words “In the name of God and of profit.”

How they figured it out. Datini’s companies show the change from single-entry lists to full double entry. Early on his clerks kept separate books of debtors and creditors, a cash book and lists of goods, with no single check that they agreed. By the 1390s some of his companies kept ledgers in which every amount appeared twice: once on the left (*dare*, “to give,” what the account owed) and once on the right (*avere*, “to have,” what it was owed). A sale of cloth on credit to a merchant in Barcelona appeared on the left of that merchant’s account and on the right of the cloth account. If the clerks added all the left sides and all the right sides and the totals agreed, the books were at least arithmetically right. If not, an error was hiding. Datini wrote constantly to his managers demanding that their books be kept up to date and sent to him.

The big idea. Duality is the heart of accounting: every transaction has two sides of equal value. When a business pays \$500 cash for supplies, it receives \$500 of supplies and gives \$500 of cash. Double entry records both, one as a **debit** (left side) and one

as a **credit** (right side), and the debits always equal the credits. Some transactions touch three or more accounts (a **compound entry**): buying a \$5,000 machine with \$2,000 cash and a \$3,000 note debits Equipment \$5,000 and credits Cash \$2,000 and Notes Payable \$3,000. Because debits equal credits in every entry, the sum of all debit balances in the ledger must equal the sum of all credit balances.

In business today. Single-entry records, like a checkbook register, list cash in and out. They cannot show what the business owns besides cash, what it owes, or whether a total is wrong. Double entry shows the whole picture and checks itself. That is why banks, investors and tax authorities expect double-entry books from every business beyond the smallest, and why accounting software will not let you save an entry whose debits and credits differ.

Think it through. Double entry does not catch every error. If a clerk records a \$300 sale as \$30 on both sides, the books still balance. Balanced books are necessary for correct books, but not sufficient. Honest source documents and careful review are still needed.

PICTURE STUDY



The Moneylender and His Wife, Quentin Matsys, 1514 · Oil on panel · Musée du Louvre, Paris

Image: [Wikimedia Commons](#), public domain

Matsys painted this Antwerp moneychanger and his wife at their counter a few years after Pacioli's *Summa*. The husband weighs coins to test them; the wife turns the page of a book of hours, a prayer book. Behind them are shelves with account books and papers. The frame once carried a line from Leviticus 19:36 about just balances and just weights.

Look closely

- Find the small balance in his hands. What is on each pan?
- Find the account books and papers on the shelves behind them.
- Find the convex mirror on the table. What does it show outside the room?
- Where is the wife looking: at her book or at the coins?

Talk about it

1. A balance has two pans that must match. How is a double-entry ledger like a balance?
2. Why would a moneychanger need to weigh coins rather than just count them?
3. What might the painter be saying by putting a prayer book and a pile of coins side by side?

PROJECT

T-Accounts for a Week of Trade

You will record a week of transactions for a small trading business in T-accounts and prove that the debits equal the credits.

You will need

- Ledger notebook
- Ruler and calculator

Steps

1. Draw seven T-accounts: Cash, Accounts Receivable, Inventory, Equipment, Accounts Payable, Notes Payable, Owner's Capital.
2. Use the rule from Worked Example 1, adding: a decrease in a liability is a debit; a decrease in an asset is a credit.
3. Record these transactions for Owen's Used Books: (1) Owen invests \$4,000 cash. (2) Buys shelving (equipment) for \$1,500: \$500 cash and a \$1,000 note. (3) Buys \$1,200 of books (inventory) on account. (4) Pays \$700 of the amount owed for books. (5) Sells books that cost \$300 to a school on account for \$300 (at cost, to keep this first week simple). (6) Collects \$300 from the school.
4. Label each entry in the T-accounts with its transaction number.
5. Find the balance of each account and write it on the correct side.
6. List the debit balances and the credit balances and total each list. They must agree.
7. Write the accounting equation from your balances and check it.
8. Write a short paragraph: which transaction was compound, and how did you know?

Tips

- Write the transaction number beside every amount so you can trace any error.
- If the totals disagree, check each entry: does every transaction have equal debits and credits?

Check your work

- ☐ Each transaction appears in at least two accounts with equal debits and credits.
- ☐ Debit balances (Cash \$3,100, Inventory \$900, Equipment \$1,500) total \$5,500, equal to credit balances (Accounts Payable \$500, Notes Payable \$1,000, Capital \$4,000).
- ☐ I can explain what double entry checks and what it cannot check.

LEDGER NOTEBOOK

1. Draw a T-account and label the debit and credit sides, with the Italian words *dare* and *avere* under them.
2. Write the motto “In the name of God and of profit” and two sentences on what it shows about how Datini saw his work.
3. Sketch the compound entry from Worked Example 2 as three T-accounts.

KEY FORMULAS

$$\sum \text{Debits} = \sum \text{Credits}$$

From history. Datini’s house in Prato still stands, and his archive is kept there by the State Archives of Prato. Historians have used his letters to learn prices, shipping routes, the cost of insurance and even what merchants ate in the 1390s.

WORKED EXAMPLES

Example 1. Name the two effects of each transaction and which side (debit or credit) each falls on, using this rule for now: an increase in an asset is a debit; an increase in a liability or the owner's capital is a credit; a decrease in an asset is a credit. (a) Owner invests \$6,000 cash. (b) Pays \$1,100 cash for a computer. (c) Buys \$450 of supplies on account.

Show solution

1. (a) Cash (asset) increases: debit Cash \$6,000. Capital increases: credit Capital \$6,000.
2. (b) Equipment (asset) increases: debit Equipment \$1,100. Cash decreases: credit Cash \$1,100.
3. (c) Supplies increase: debit Supplies \$450. Accounts Payable (liability) increases: credit Accounts Payable \$450.
4. Totals: debits $6,000 + 1,100 + 450 = \$7,550$; credits $6,000 + 1,100 + 450 = \$7,550$.

Answer: Each transaction has one debit and one credit of equal amount; totals are \$7,550 on each side.

Example 2. A business buys a delivery cart for \$5,000, paying \$2,000 cash and signing a \$3,000 note. Write the compound entry and show it balances.

Show solution

1. Debit Equipment \$5,000; credit Cash \$2,000; credit Notes Payable \$3,000.
2. Debits: \$5,000. Credits: $\$2,000 + \$3,000 = \$5,000$.
3. Equation check: assets $+5,000 - 2,000 = +3,000$; liabilities $+3,000$.

Answer: Equipment \$5,000 debit = Cash \$2,000 + Notes Payable \$3,000 credits.

Example 3. Post the transactions of Worked Example 1 to T-accounts for Cash, Equipment, Supplies, Accounts Payable and Capital, find each balance, and prove debit balances equal credit balances.

Show solution

1. Cash: debit 6,000; credit 1,100. Balance: \$4,900 debit.
 2. Equipment: debit 1,100. Balance \$1,100 debit.
 3. Supplies: debit 450. Balance \$450 debit.
 4. Accounts Payable: credit 450. Balance \$450 credit.
 5. Capital: credit 6,000. Balance \$6,000 credit.
 6. Debit balances: $4,900 + 1,100 + 450 = \$6,450$. Credit balances: $450 + 6,000 = \$6,450$.
-

Answer: Debit balances \$6,450 = credit balances \$6,450.

PRACTICE

1. Easy What is duality in accounting?

Show answer

Every transaction has two equal sides, something received and something given (or a resource and a claim), and both are recorded.

2. Easy Who was Francesco Datini, and why do historians value his papers?

Show answer

A merchant of Prato (about 1335–1410) whose roughly 500 account books and 150,000 letters survive, the largest medieval business archive, showing how double entry developed.

3. Easy Which side of a T-account is the debit side?

Show answer

The left side.

4. Medium Give the debit and credit: the owner invests \$3,500 cash.

Show answer

Debit Cash \$3,500; credit Owner's Capital \$3,500.

5. **Medium** Give the debit and credit: the business buys \$820 of supplies on account.

Show answer

Debit Supplies \$820; credit Accounts Payable \$820.

6. **Medium** Give the debit and credit: the business pays \$1,400 cash for a printer.

Show answer

Debit Equipment \$1,400; credit Cash \$1,400.

7. **Medium** Write the compound entry: a van costing \$18,000 is bought with \$4,000 cash and a \$14,000 note.

Show answer

Debit Equipment (Vehicles) \$18,000; credit Cash \$4,000; credit Notes Payable \$14,000.

8. **Hard** Cash has debits of \$5,000, \$700 and \$1,250 and credits of \$900, \$2,100 and \$400. What is the balance and which side?

Show answer

Debits \$6,950 – credits \$3,400 = \$3,550 debit balance.

9. **Hard** A clerk records a \$640 purchase of supplies as \$460 in both Supplies and Accounts Payable. Will the ledger balance? Is it correct?

Show answer

It balances, because both sides are \$460, but both accounts are understated by \$180. Balanced books are not always correct books.

10. **Hard** Why is a checkbook register single entry, and what can double entry show that it cannot?

Show answer

It records only cash. Double entry also shows the other side (what was bought, owed or earned), so it shows all assets, liabilities, equity and profit, and it checks itself.

11. **Challenge** Datini's clerks used *dare* (to give) and *avere* (to have). Explain why a customer who bought on credit was entered on the *dare* side of his account.

Show answer

The customer owes (must give) the merchant the price; from the merchant's view, the customer's account is a debtor, so it goes on the left, the debit side.

COMMON MISTAKES

- Thinking "debit" means decrease and "credit" means increase. They mean left and right; what they do depends on the account type.
- Writing a compound entry whose parts do not add up to equal totals.
- Believing balanced books must be correct. An error made equally on both sides still balances.

Make it a game • Datini T-Account Speed Round. Draw a blank T-account for cash, inventory, accounts payable and sales on scrap paper. Your parent calls eight trades one by one, in the style of Datini's merchant ledgers. For each, say which accounts get a debit and which a credit, then post the amounts. Both sides must match at the end. Time the round and try to beat your record.

1.4 THE CHART OF ACCOUNTS: FUGGER'S COUNTING ROOM

OBJECTIVES

- Explain what a chart of accounts is and why a business needs one before it records transactions.
- Classify accounts into the five types (assets, liabilities, equity, revenue, expenses) and number them in a standard pattern.
- Design a chart of accounts for a small business and arrange it in financial-statement order.

Warm-up. Empty a drawer or a backpack onto a table and sort the things into groups. How many groups did you make? Could someone else find something quickly using your groups? Write down your group names.

WATCH

CHART OF ACCOUNTS: Explained in (Almost) 2 Minutes!

Accounting Stuff • 4:22

<https://www.youtube.com/watch?v=LmlvNWlrN6g>

WHEN TO WATCH

After the big idea and before the worked examples.

BACKUP VIDEO

General Ledger and Chart of Accounts | Principles of Accounting

Course Hero • 5:55

<https://www.youtube.com/watch?v=GPqC5hjf5GE>

With the project, to see how the chart connects to the general ledger.

KEY TERMS

chart of accounts

The list of every account a business uses, with a number and name for each, arranged in a fixed order.

general ledger

The book or file that holds all the accounts in the chart, each with its entries and balance.

account number

A code that shows an account's type and place: commonly 100s assets, 200s liabilities, 300s equity, 400s revenue, 500s and up expenses.

permanent (real) accounts

Asset, liability and capital accounts, whose balances carry forward from one period to the next.

temporary (nominal) accounts

Revenue, expense and drawing accounts, which collect one period's activity and are closed to capital at the period's end (Lesson 3.4).

CORE IDEAS

The story. Jakob Fugger of Augsburg (1459–1525), called “the Rich,” ran the largest business in Europe in his day: copper and silver mines in the Tyrol and Hungary, trade in cloth and spices, and loans to popes, princes and the Holy Roman Emperor. His chief accountant from 1516, Matthäus Schwarz, had studied bookkeeping in Venice and Milan. A small painting made for Schwarz in 1516 shows him at a desk with Fugger standing beside him. Behind them is a cabinet with labeled drawers: Rom, Venedig, Ofen (Buda), Krakau, Mailand, Insbruck, Nürnberg, Antorf (Antwerp) and Lisbona. Each drawer held the papers of one branch.

How they figured it out. A firm with branches in nine cities cannot keep its books as one long list. Schwarz organized the Fugger accounts so that every branch sent in its own balances, which were combined at Augsburg into a single statement of the firm's position; the first such Fugger statement survives from 1511, and later ones were drawn up every few years when the partners settled accounts. Schwarz also wrote a bookkeeping manual in 1518. The labeled drawers show the key idea: *decide the categories first, then file every paper in exactly one place*. That is what a chart of accounts does for the ledger.

The big idea. A **chart of accounts** is the list of every account a business uses, numbered in a pattern that shows its type. A common pattern is: 100–199 assets, 200–299 liabilities, 300–399 owner's equity, 400–499 revenue, 500–699 expenses. Within assets, accounts are listed in order of liquidity (how soon they become cash): 101 Cash, 111 Accounts Receivable, 141 Supplies, 145 Prepaid Insurance, then long-term assets such as 181 Equipment. Gaps are left so new accounts can be added. The

chart follows the order of the financial statements, so the trial balance and the statements can be read straight down the ledger. **Permanent** accounts (assets, liabilities, capital) carry their balances forward; **temporary** accounts (revenue, expenses, drawing) start each year at zero.

In business today. Every accounting program begins setup by asking for a chart of accounts, and most offer a sample chart for the kind of business. Large companies use longer codes that add a department or location, much as Fugger's drawers added a city: 5110-03 might mean "wages expense, store number 3." A good chart is detailed enough to answer the owner's questions (How much do we spend on fuel?) but not so detailed that the bookkeeper wastes time on accounts with three entries a year.

Think it through. Fugger's firm grew rich partly because he knew his position better than his rivals did. Knowing exactly where each florin was, and what each branch earned, let him lend boldly where he was strong and pull back where he was weak.

PICTURE STUDY



Jakob Fugger in His Counting Room with His Accountant Matthäus Schwarz, Narziss Renner (attributed), for Matthäus Schwarz, 1516 · Watercolor and gouache on parchment, from Schwarz's book of costumes · Herzog Anton Ulrich-Museum, Braunschweig

Image: [Wikimedia Commons](#), public domain

Matthäus Schwarz kept a book of paintings showing what he wore at each stage of his life. This page shows him, aged about nineteen, at work as Fugger's accountant, with his master beside him and the cabinet of branch papers behind.

Look closely

- Read the city names on the drawers. How many branches can you count?
- Find the ledger on the desk. Who is standing at it, and where is he looking?
- What is Fugger doing while Schwarz writes?
- Find any coins, papers or tools on the desk.

Talk about it

1. How is the cabinet of drawers like a chart of accounts?
2. Why would a firm with branches in many cities need each branch's accounts kept separately and then combined?
3. What does it tell you that Schwarz, the accountant, is at the center of the picture and Fugger stands to the side?

PROJECT

Design a Chart of Accounts

You will design a numbered chart of accounts for a real or realistic small business, test it against a list of transactions, and improve it.

You will need

- Ledger notebook or spreadsheet
- Optional: GnuCash (free) to see a sample chart

Steps

1. Choose a business: a family business (with a parent's help), a business you would like to start, or one of these: a dog-walking service, a used-book stall, a small farm stand.
2. List every asset the business would own, every liability it might owe, and its equity accounts (capital and drawing).
3. List every kind of revenue and every kind of expense you expect.
4. Number the accounts using 100s for assets (in order of liquidity), 200s liabilities, 300s equity, 400s revenue and 500s and up for expenses. Leave gaps.
5. Mark each account P (permanent) or T (temporary).
6. Write ten realistic transactions for the business's first month (an investment, purchases, sales, bills paid).
7. For each transaction, name the two (or more) accounts from your chart it would use. If you cannot find an account, add one in the right place.
8. If you have GnuCash or a spreadsheet, enter your chart and compare it with a sample chart for a similar business.
9. Write a paragraph: what questions will your chart let the owner answer at a glance, and what did you add after testing it?

Tips

- Name accounts plainly: "Fuel Expense," not "Misc. Car Stuff."
- Avoid an account called "Miscellaneous" for anything large or frequent; it hides information.

Check your work

- ☐ My chart has at least 12 accounts, correctly classified and numbered with gaps.
- ☐ Every one of my ten transactions uses accounts from the chart.
- ☐ I can explain the difference between permanent and temporary accounts.

LEDGER NOTEBOOK

1. Draw a cabinet of drawers like Fugger's and label the drawers with the five account types and their number ranges.
2. Copy the Hart Bicycle Repair chart from Worked Example 1.
3. Write three questions an owner could answer from a good chart of accounts.

From history. Jakob Fugger's loans helped Charles V become Holy Roman Emperor in 1519, and Fugger later reminded the emperor of it in a famous letter asking to be repaid. In 1521 Fugger founded the Fuggerei in Augsburg, homes for poor working families at a token rent; it is still lived in today, and the rent is still one Rhenish guilder a year.

WORKED EXAMPLES

Example 1. Classify and number these accounts for Hart Bicycle Repair using the pattern 100s assets, 200s liabilities, 300s equity, 400s revenue, 500s expenses: Rent Expense, Cash, Daniel Hart Capital, Accounts Payable, Repair Revenue, Equipment, Supplies, Daniel Hart Drawing, Accounts Receivable, Utilities Expense, Notes Payable.

Show solution

1. Assets in order of liquidity: 101 Cash, 111 Accounts Receivable, 141 Supplies, 181 Equipment.
2. Liabilities: 201 Accounts Payable, 211 Notes Payable.
3. Equity: 301 Daniel Hart Capital, 302 Daniel Hart Drawing.
4. Revenue: 401 Repair Revenue.
5. Expenses: 511 Rent Expense, 521 Utilities Expense.

Answer: 101 Cash; 111 Accounts Receivable; 141 Supplies; 181 Equipment; 201 Accounts Payable; 211 Notes Payable; 301 Capital; 302 Drawing; 401 Repair Revenue; 511 Rent Expense; 521 Utilities Expense.

Example 2. A bakery's owner wants to know each month how much she spends on flour and butter versus electricity for the ovens, and how much revenue comes from bread versus cakes. Design the revenue and expense part of her chart.

Show solution

1. Revenue needs two accounts so she can compare product lines: 401 Bread Sales, 402 Cake Sales.
2. Ingredient costs: 511 Ingredients Expense (or two accounts, 511 Flour and 512 Butter and Dairy, if she wants that detail).
3. Other costs: 521 Wages Expense, 531 Rent Expense, 541 Utilities Expense (electricity and gas for the ovens), 551 Supplies Expense (boxes, bags).
4. Gaps (403–409, 513–519) leave room to add accounts later without renumbering.

Answer: 401 Bread Sales; 402 Cake Sales; 511 Ingredients; 521 Wages; 531 Rent; 541 Utilities; 551 Supplies Expense, with gaps for growth.

Example 3. Which of these are permanent and which temporary accounts: Cash; Sales Revenue; Owner's Drawing; Equipment; Wages Expense; Accounts Payable; Owner's Capital?

Show solution

1. Permanent (balances carry forward): Cash, Equipment, Accounts Payable, Owner's Capital.
2. Temporary (closed at year-end): Sales Revenue, Wages Expense, Owner's Drawing.

Answer: Permanent: Cash, Equipment, Accounts Payable, Capital. Temporary: Sales Revenue, Wages Expense, Drawing.

PRACTICE

1. Easy What is a chart of accounts?

Show answer

A numbered list of every account the business uses, in a fixed order.

2. **Easy** In the common numbering pattern, what type is account 215? 410? 125?

Show answer

215 liability; 410 revenue; 125 asset.

3. **Easy** What did the labeled drawers in Fugger's counting room hold?

Show answer

The papers of each branch city (Rome, Venice, Buda, Kraków, Milan, Innsbruck, Nuremberg, Antwerp, Lisbon).

4. **Medium** Put these assets in order of liquidity: Equipment, Supplies, Cash, Accounts Receivable, Land.

Show answer

Cash, Accounts Receivable, Supplies, Equipment, Land.

5. **Medium** Why do accountants leave gaps in account numbers?

Show answer

So new accounts can be added in the right place later without renumbering.

6. **Medium** Classify as permanent or temporary: Prepaid Insurance, Fees Earned, Owner's Drawing, Notes Payable, Advertising Expense.

Show answer

Permanent: Prepaid Insurance, Notes Payable. Temporary: Fees Earned, Drawing, Advertising Expense.

7. **Medium** Why is Owner's Drawing numbered in the equity section rather than with expenses?

Show answer

It reduces the owner's equity directly; it is not a cost of earning revenue.

8. **Hard** A lawn-care business has these accounts: Mower Fuel Expense, Truck, Cash, Mowing Revenue, Owner Capital, Loan from Bank, Snow-Plowing Revenue, Insurance Expense, Accounts Receivable, Owner Drawing. Write a numbered chart.

Show answer

101 Cash; 111 Accounts Receivable; 181 Truck; 211 Loan (Notes) Payable; 301 Capital; 302 Drawing; 401 Mowing Revenue; 402 Snow-Plowing Revenue; 511 Fuel Expense; 521 Insurance Expense.

9. **Hard** A store with three locations uses codes like 5110-02. What might the two parts mean, and how is this like Fugger's drawers?

Show answer

5110 is the account (for example, wages expense) and 02 the location. Like Fugger's city drawers, it lets the firm see results by branch.

10. **Hard** Give one reason a chart of accounts can be too detailed and one reason it can be too vague.

Show answer

Too detailed: many tiny accounts waste time and invite mis-coding. Too vague: lumping costs together hides answers the owner needs.

11. **Challenge** Design a chart of accounts with at least 14 accounts for a church: think about offerings, designated gifts for missions, building costs, salaries and a building loan.

Show answer

Sample: 101 Cash–Operating; 102 Cash–Missions Fund; 141 Supplies; 181 Building; 182 Equipment; 201 Accounts Payable; 211 Mortgage Payable; 301 Net Assets–Unrestricted; 311 Net Assets–Designated for Missions; 401 General Offerings; 402 Missions Gifts; 511 Salaries; 521 Utilities; 531 Building Repairs; 541 Missions Support Paid; 551 Interest Expense.

COMMON MISTAKES

- Listing assets in random order. Use order of liquidity, starting with cash.
- Putting Drawing among the expenses.
- Creating a vague “Miscellaneous” account that ends up holding large, important amounts.

Make it a game • Number the Counting Room. In 60 seconds, write the five account types and the number range you would give each, such as 1000s for assets. Then your parent calls out twelve account names, from Rent Expense to Unearned Revenue. Give each its type, a plausible account number and whether it is permanent or temporary. Challenge your parent to spot any mistakes you make.

1.5 WHY HONEST BOOKS MATTER

OBJECTIVES

- Identify the users of accounting information among the six stakeholders and what each needs to know.
- Explain basic accounting principles: the business entity, monetary unit, cost, periodicity and going-concern assumptions, and the role of generally accepted accounting principles (GAAP).
- Explain from Scripture and history why accounting is a work of trust.

Warm-up. Suppose a friend asks you to lend him \$50 for his lawn-mowing business and says it is “doing great.” What would you want to see before lending? Write three questions.

WATCH

ACCOUNTING BASICS: a Guide to (Almost) Everything

Accounting Stuff • 14:12

<https://www.youtube.com/watch?v=yYX4bvQSqbo>

WHEN TO WATCH

After the core ideas. It reviews the whole unit and previews the course; pause at each section and connect it to a lesson.

BACKUP VIDEO

FINANCIAL STATEMENTS: all the basics in 8 MINS!

Accounting Stuff • 9:05

<https://www.youtube.com/watch?v=Fi1wkUczuyk>

Before the stakeholder worked example, as a preview of the four statements.

KEY TERMS

financial statements

The formal reports of accounting: the income statement, the statement of owner's equity, the balance sheet and the statement of cash flows.

GAAP

Generally accepted accounting principles: the common rules for preparing financial statements in the United States, set today by the Financial Accounting Standards Board (FASB, founded 1973).

business entity assumption

The business's records are kept separate from the owner's personal records.

cost principle

Assets are recorded at what they cost when acquired, not at an estimate of what they might sell for.

going concern and periodicity

Accountants assume the business will continue operating, and they divide its life into equal periods (months, quarters, years) for reporting.

stewardship

Managing what belongs to another faithfully and being ready to give an account of it.

CORE IDEAS

The story. In 1662 Rembrandt painted five officials of the Amsterdam drapers' guild, the *staalmeesters* or sampling officials, gathered around a table with a large book open before them. They were chosen each year to inspect the cloth that guild members made and to stamp it with seals for its quality, so that buyers anywhere could trust Amsterdam cloth. The painting hung in their meeting hall as a reminder that they answered to the whole guild. Jesus told a parable of a steward whose master called him and said, "give an account of thy stewardship" (Luke 16:2). Every steward, manager and bookkeeper must one day do the same.

How they figured it out. As businesses grew, more people depended on the books of firms they could not inspect themselves. After the stock-market crash of 1929, it became clear that many companies had published misleading reports. The Securities Act of 1933 and the Securities Exchange Act of 1934 required companies selling stock to the public to publish audited financial statements, and the Securities and Exchange Commission (SEC) was created in 1934 to enforce the rules.

Accountants then wrote down common standards so that statements from different companies could be compared; since 1973 the private Financial Accounting Standards Board (FASB) has set U.S. **GAAP**. Most other countries use International Financial Reporting Standards (IFRS).

The big idea. Accounting serves people. Think of the six stakeholders as the users of the books. **Financiers** (banks, investors) ask: Can it repay? Will it earn a return? **Risk-takers** (owners) ask: Is it profitable? Should I expand? **Builders** (managers) ask: Which products or branches earn money? **Workers** ask: Is my job secure, and can the firm pay wages and benefits? **Customers** ask: Will this firm be here to honor its warranty? **The community**, including the tax authorities, asks: Is it paying its taxes and dealing honestly? A few basic assumptions make the statements trustworthy and comparable: the **business entity** (the owner's personal spending is kept out), the **monetary unit** (everything is measured in dollars), the **cost principle** (assets recorded at what was paid), the **going concern** and **periodicity** assumptions, and full disclosure of anything a reader needs to know.

In business today. When books are false, real people are hurt: lenders lose their money, workers lose jobs and savings, customers lose warranties, towns lose taxes. You will study such failures in Units 5 and 9. When books are honest, trust lets strangers lend, invest and trade with one another. That is why accounting is a calling of trust, and why Proverbs tells the shepherd, and every steward, to know the true state of his flocks.

Think it through. Accounting cannot be value-free. Every estimate (how long a truck will last, how many customers will not pay) can be made honestly or bent toward the answer someone wants. The rules help, but in the end the books are only as honest as the people who keep them.

PICTURE STUDY



The Syndics of the Drapers' Guild, Rembrandt van Rijn, 1662 · Oil on canvas · Rijksmuseum, Amsterdam

Image: [Wikimedia Commons](#), public domain

Rembrandt painted the five sampling officials of the Amsterdam drapers' guild and their servant. They inspected cloth and sealed it as a guarantee of quality. The painting hung in the guild's hall, where the members they served could see them.

Look closely

- Find the large book on the table. Who is pointing to it?
- Count the officials and find the servant. How can you tell them apart?
- Notice that everyone is looking out of the painting, toward you. How does that feel?
- Find the man who is half rising from his chair.

Talk about it

1. Why might it matter that these officials are painted looking out at the guild members they served?
2. How is inspecting cloth for a guild like an accountant's work for a company's stakeholders?
3. If the officials had sealed bad cloth as good, who would have been hurt?

PROJECT

Who Reads the Books? A Stakeholder Interview

You will find out, from a real person, how accounting information is used, and connect it to the six stakeholders.

You will need

- Ledger notebook
- A parent to arrange and attend an interview

Steps

1. With a parent, arrange a short interview (in person, by phone or by video with a parent present) with someone who uses financial records: a small-business owner, a church treasurer, a bookkeeper, a farmer or a loan officer.
2. Prepare eight questions, at least one for each of these: what records they keep; who else sees them; what decisions they make from them; what happens when a record is wrong.
3. Ask, and take notes. Do not ask for private numbers; ask about how the numbers are used.
4. After the interview, make a table with the six stakeholders down the side. For each, write what this person's records tell that group, or note that the group is not served by them.
5. Write the five principles from this lesson (entity, monetary unit, cost, going concern, periodicity) and give one example of each from the interview, if you heard one.
6. Write a thank-you note to the person you interviewed.
7. Write a one-page summary: what you learned about why honest books matter, with one quotation from the interview and one verse from this unit.

Tips

- Ask "Can you tell me about a time when...?" to get stories rather than short answers.
- Never ask for account numbers, balances or private details.

Check your work

- ☐ I asked at least eight prepared questions and took notes.
- ☐ My stakeholder table covers all six groups.
- ☐ My summary connects the interview to at least two accounting principles.

LEDGER NOTEBOOK

1. Draw six circles around a ledger and label each with a stakeholder and the question that group asks of the books.
2. Write Proverbs 27:23 and, under it, three ways a business owner can “know the state” of the business.
3. List the five principles with a one-line example of each.

From history. The Dutch guild officials also checked each other: they served one-year terms and were replaced, so no one controlled the seals for long. Rotation and review are still basic safeguards of honest accounting.

WORKED EXAMPLES

Example 1. Using the six stakeholders, say what each would want to learn from the financial statements of a regional grocery chain that wants to borrow \$2 million to open three stores.

Show solution

1. Financiers (the bank): Can the chain pay interest and repay the loan from its cash flow? What does it already owe? What assets back the loan?
2. Risk-takers (owners): Will the new stores earn more than the cost of the loan? How much of their equity is at risk?
3. Builders (managers): Which existing stores are most profitable, and what makes them so?
4. Workers: Is the chain profitable enough to keep wages and jobs secure as it grows?
5. Customers: Will the stores stay open and keep prices and quality steady?
6. Community: How many jobs will the stores bring? Does the chain pay its taxes and suppliers on time?

Answer: Each stakeholder reads the same statements for a different question; all need them to be honest.

Example 2. Apply the principles. (a) The owner of a bakery uses the business checking account to pay \$300 for her family's groceries. (b) The bakery buys land for \$50,000; a year later similar land sells for \$70,000. (c) A customer offers to pay \$2,000 next year for a wedding cake.

Show solution

1. (a) Business entity: this is not a bakery expense. Record it as Owner's Drawing \$300 (debit Drawing, credit Cash), not as an expense.
2. (b) Cost principle: the land stays on the books at \$50,000. The \$70,000 is an estimate, not a transaction.
3. (c) No transaction has occurred: nothing has been received or delivered. Nothing is recorded yet.

Answer: (a) Drawing, not expense; (b) land stays at \$50,000 cost; (c) no entry.

Example 3. A shop owner reports profit of \$40,000, but his records mix family and business spending: \$6,000 of family travel was recorded as business travel expense, and \$4,500 of shop supplies were paid from his personal account and never recorded. What is the correct profit?

Show solution

1. Family travel is not a business expense: remove \$6,000 of expenses, raising profit to $40,000 + 6,000 = \$46,000$ (and record the \$6,000 as drawing).
2. Unrecorded shop supplies used are a business expense: add \$4,500 of expenses, lowering profit to $46,000 - 4,500 = \$41,500$ (and record it as an owner investment of \$4,500).
3. Net change: $+6,000 - 4,500 = +1,500$.

Answer: Correct profit is \$41,500.

PRACTICE

1. Easy Name the four financial statements.

Show answer

Income statement, statement of owner's equity, balance sheet, statement of cash flows.

2. **Easy** What is GAAP, and who sets it in the United States today?

Show answer

Generally accepted accounting principles, set by the Financial Accounting Standards Board (FASB).

3. **Easy** Which laws first required public companies to publish audited statements, and what agency enforces them?

Show answer

The Securities Act of 1933 and Securities Exchange Act of 1934; the SEC.

4. **Medium** Which principle is broken if a business records its building at what the owner thinks it would sell for?

Show answer

The cost principle.

5. **Medium** Which principle is broken if the owner's home mortgage payments are recorded as a business expense?

Show answer

The business entity assumption.

6. **Medium** Name what a bank and what a worker would each look for first in a company's statements.

Show answer

Bank: ability to repay (cash flow, debts, assets). Worker: stability and profitability, ability to pay wages and benefits.

7. **Medium** Why must accounting divide a business's life into periods?

Show answer

Owners, lenders and tax authorities need regular reports to make decisions; a business that will continue for decades cannot wait until it closes to measure profit.

8. **Hard** A business reported net income of \$28,000. It included \$3,200 of the owner's personal car repairs as an expense and failed to record \$1,800 of business utilities paid personally. Correct net income?

Show answer

$$28,000 + 3,200 - 1,800 = \$29,400.$$

9. **Hard** Who were the sampling officials (staalmeesters) in Rembrandt's painting, and why does their job relate to honest books?

Show answer

Officials of the Amsterdam drapers' guild, elected yearly to inspect and seal cloth for quality. Like accountants, they gave outsiders a trustworthy report on something they could not check themselves.

10. **Hard** Give an example of an accounting estimate that could be made honestly or dishonestly.

Show answer

Sample: how many years a machine will last (for depreciation), or how many receivables will never be collected.

11. **Challenge** Write a paragraph explaining Proverbs 27:23 to a new small-business owner who says, "I don't need books; I know my business."

Show answer

Answers should show that knowing "the state of thy flocks" requires counting, not guessing; that memory misleads; that lenders, partners and tax authorities need records; and that honest records protect both the owner and those who deal with him.

COMMON MISTAKES

- Thinking accounting is only for owners and the tax office. Lenders, workers, customers and the community all depend on it.
- Writing assets up to what they might sell for. The cost principle records what was actually paid.
- Mixing personal and business spending.

Make it a game • Stakeholder Charades. Write six stakeholders on slips and draw one without showing your parent. Act out the questions that person would ask of a company's books, such as whether the loan can be repaid or how much tax is due, without speaking. Your parent guesses the stakeholder. Then state which accounting assumption, such as business entity or going concern, that user depends on.

Scripture. “Be thou diligent to know the state of thy flocks, and look well to thy herds.” (Proverbs 27:23, KJV)

A shepherd’s flock was his wealth. Knowing its true state, by careful counting rather than guessing, is the first duty of a good steward and the purpose of accounting.

UNIT 1

THE LANGUAGE OF BUSINESS

Accounting is called the language of business because owners, lenders, investors, managers and tax authorities all read the same reports. This unit teaches the grammar of that language through the people who first wrote it down: the merchants and city treasurers of Genoa, Florence and Venice, Francesco Datini of Prato with his 500 account books, Luca Pacioli with his printed *Summa* of 1494, and Jakob Fugger's accountant Matthäus Schwarz with his cabinet of labeled drawers.

You will learn the accounting equation ($\text{assets} = \text{liabilities} + \text{owner's equity}$), the double-entry idea that every transaction has two equal sides, and the chart of accounts that organizes every business's ledger. The unit ends with why honest books matter, to each of the six stakeholders and before God: "Be thou diligent to know the state of thy flocks" (Proverbs 27:23).

PREREQUISITES

- Algebra I: solving one-step and two-step equations
- Working with percents and decimals
- Adding columns of numbers accurately by hand and with a calculator

MASTERY CHECKLIST

- ☐ I can tell how Italian merchants developed double entry and how Pacioli's

Su (1494) spread it.

m

m

a

- ☐ I can analyze any simple transaction for its effect on assets, liabilities and equity, and keep the accounting equation in balance.
- ☐ I can record transactions as equal debits and credits in T-accounts, including compound entries.
- ☐ I can design and number a chart of accounts in financial-statement order.
- ☐ I can explain who uses financial statements and why the entity, cost, going-concern and periodicity principles make them trustworthy.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Principles of Accounting, Volume 1: Financial Accounting (OpenStax, Rice University)**: A free, complete college textbook online or as a PDF. Use it as a reference all year; Chapters 1–3 match this unit. Ages 15 and up.
- **GnuCash**: Free, open-source double-entry accounting software for Windows, Mac and Linux. Optional. In Lesson 1.4, create a new book and compare its sample chart of accounts with yours. Install with a parent.
- **Ancient Double-Entry Bookkeeping, by John B. Geijsbeek (1914)**: Free on the Internet Archive. An English translation of Pacioli’s bookkeeping chapters with the Italian facing. Read a few pages of Pacioli’s own instructions with Lesson 1.1. Ages 15 and up.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

1.1	Pacioli and the Merchants of Venice	3 sessions of 50 minutes
1.2	The Accounting Equation	3 sessions of 50 minutes
1.3	The Double-Entry Idea: Datini of Prato	3 sessions of 50 minutes
1.4	The Chart of Accounts: Fugger’s Counting Room	3 sessions of 50 minutes
1.5	Why Honest Books Matter	3 sessions of 50 minutes

UNIT 1 TEST

Calculators are allowed. Show your work for every calculation: write the equation or the entry, then the numbers. Every entry must have equal debits and credits. Answer the concept questions in complete sentences. The test is worth 100 points.

1. **5 pts**

What did Luca Pacioli publish in 1494, and what was his contribution to accounting?

2. (5 pts)

Name Pacioli's three books and the inventory that opens them.

3. (6 pts)

A merchant owns cash \$3,000, goods \$7,500 and a wagon \$1,200, and is owed \$800. He owes a bank \$4,000 and a supplier \$1,100. Find his capital and write the check line.

4. (6 pts)

Classify each as asset, liability, equity, revenue or expense: Notes Payable; Supplies; Fees Earned; Owner's Capital; Wages Expense; Accounts Receivable.

5. (8 pts)

Show the effect on assets, liabilities and equity: (a) owner invests \$5,000; (b) buys equipment \$2,000 on account; (c) earns \$900 cash fees; (d) pays \$300 wages.

6. (8 pts)

After the four transactions in Problem 5 (starting from zero), find total assets, liabilities and equity and prove the equation.

7. (6 pts)

Beginning equity \$20,000; owner investment \$4,000; revenue \$31,000; expenses \$24,500; withdrawals \$6,000. Find net income and ending equity.

8. (6 pts)

Write the entry: a machine costing \$9,000 is bought with \$2,500 cash and a note for the rest.

9. (8 pts)

Post to T-accounts and find the balances: owner invests \$6,000 cash; buys supplies \$700 on account; pays \$1,800 cash for equipment; pays \$400 on account. Prove that debit balances equal credit balances.

10. (5 pts)

Explain duality and why double entry lets the books check themselves.

11. (5 pts)

Give an example of an error that double entry will not catch.

12. **6 pts**

Number these accounts in a chart (100s–500s): Rent Expense, Cash, Owner Drawing, Service Revenue, Equipment, Accounts Payable, Owner Capital, Accounts Receivable.

13. **4 pts**

Which of the accounts in Problem 12 are temporary?

14. **6 pts**

Name the principle: (a) land stays at \$40,000 though it could sell for \$55,000; (b) the owner's personal phone bill is kept out of the business books; (c) profit is reported every year.

15. **6 pts**

A business reports net income of \$15,000. It recorded the owner's \$2,000 family vacation as travel expense and omitted \$700 of business supplies paid personally. Correct net income?

16. **10 pts**

Essay (one or two paragraphs): Using at least four of the six stakeholders, explain why honest books matter, and connect your answer to Proverbs 27:23 or to Datini, Fugger or Rembrandt's syndics.

ANSWER KEY

1. The *Summa de arithmetica*, printed in Venice. It contained a clear explanation of the Venetian method of double-entry bookkeeping; he did not invent it, but his printed account spread it across Europe.
2. The inventory lists everything owned and owed; then the memorandum (rough notes), journal (dated entries with debit and credit) and ledger (one page per account).
3. Owned \$12,500; owed \$5,100; capital \$7,400. Check: $12,500 = 5,100 + 7,400$.
4. Liability; asset; revenue; equity; expense; asset.
5. (a) A +5,000, E +5,000 (b) A +2,000, L +2,000 (c) A +900, E +900 (d) A -300, E -300.
6. Assets: cash $5,000 + 900 - 300 = 5,600$ plus equipment $2,000 = \$7,600$. Liabilities \$2,000. Equity $5,000 + 900 - 300 = \$5,600$. $7,600 = 2,000 + 5,600$.
7. Net income = $31,000 - 24,500 = \$6,500$. Ending equity = $20,000 + 4,000 + 6,500 - 6,000 = \$24,500$.
8. Debit Equipment \$9,000; credit Cash \$2,500; credit Notes Payable \$6,500.
9. Cash $6,000 - 1,800 - 400 = \$3,800$ Dr; Supplies \$700 Dr; Equipment \$1,800 Dr; Accounts Payable $700 - 400 = \$300$ Cr; Capital \$6,000 Cr. Debits 6,300 = credits 6,300.
10. Every transaction has two equal sides; recording both as a debit and a credit makes total debits equal total credits, so an unequal total reveals an error.
11. Recording the wrong amount on both sides (for example \$500 as \$50 in both accounts), or debiting the wrong account of the same type.
12. 101 Cash; 111 Accounts Receivable; 181 Equipment; 201 Accounts Payable; 301 Capital; 302 Drawing; 401 Service Revenue; 511 Rent Expense.
13. Owner Drawing, Service Revenue, Rent Expense.
14. (a) cost principle (b) business entity (c) periodicity.
15. $15,000 + 2,000 - 700 = \$16,300$.
16. A strong answer names at least four stakeholders and what each needs (for example, lenders deciding to lend, owners deciding to expand, workers' job security, customers' warranties, taxes for the community), explains the harm false books would do, and ties the idea of knowing the true state of one's affairs to the verse or to one of the historical examples.

PORTFOLIO PIECE: THE OPENING BOOKS OF A SMALL BUSINESS

Choose a small business (real, with a parent's help, or realistic) and open its books. Write an opening inventory, a numbered chart of accounts with at least 12 accounts, and twelve transactions for its first month. Record them in an accounting-equation table and in T-accounts, prove the equation and the equality of debits and credits, and write a one-page letter to a banker explaining the business's position at month-end and why the banker can trust your records.

LOOK FOR	WHAT IT MEANS
Chart of accounts	At least 12 accounts, correctly classified, numbered in order with gaps, and marked permanent or temporary.
Transactions	Twelve realistic transactions, including an investment, a credit purchase, a credit sale, a compound entry and a withdrawal.
Balance	The equation balances after every line, and T-account debit balances equal credit balances.
Letter to a banker	Explains assets, liabilities, equity and net income in plain words and names at least two principles that make the records trustworthy.

UNIT 2

RECORDING TRANSACTIONS

In Unit 1 you learned that every transaction has two sides. In this unit you learn to record them the way bookkeepers have for six centuries: with debits and credits, first in the journal, then in the ledger, and then tested in a trial balance. The stories come from the Hanseatic merchants Holbein painted at the London Steelyard, from George Washington's exact war-expense accounts, from Pacioli's rules for numbered, stamped ledgers, and from a Bristol bookkeeper who claimed he had a better system and was proved wrong.

You will keep a full month of books for a small music-lesson business, journalizing, posting and preparing its trial balance, and then play error detective, finding and correcting planted mistakes with the tests of the trade: half the difference, divisible by 9, and the honest single line through an error.

PREREQUISITES

- The accounting equation and transaction analysis (Lesson 1.2)
- T-accounts and the double-entry idea (Lesson 1.3)
- A chart of accounts (Lesson 1.4)

MASTERY CHECKLIST

- ☐ I can state the debit and credit rules and normal balances for every type of account.
- ☐ I can journalize simple and compound transactions with dates and explanations.
- ☐ I can post to four-column ledger accounts with posting references and running balances.
- ☐ I can prepare a trial balance and explain what it proves and what it cannot prove.
- ☐ I can locate errors from the trial balance difference and write correcting entries.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **AccountingCoach.com**: Free explanations, quizzes and flashcards on debits and credits, journals and the trial balance, written by a CPA. The free sections are enough. Ages 15 and up.
- **GnuCash**: Free double-entry software. Optional: enter the Maple Street Music month and compare GnuCash's trial balance report with yours.
- **LibreOffice Calc**: Free spreadsheet software for the journal and trial balance projects. Google Sheets works just as well.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

2.1	Debits and Credits: The Merchant's Trust	3 sessions of 50 minutes
2.2	The Journal: George Washington's Account Books	3 sessions of 50 minutes
2.3	Posting to the Ledger	3 sessions of 50 minutes
2.4	The Trial Balance	3 sessions of 50 minutes
2.5	Finding and Correcting Errors	3 sessions of 50 minutes

UNIT 2 TEST

Calculators are allowed. Show your work. Every journal entry must have equal debits and credits and an account title for each line. Answer the concept questions in complete sentences. The test is worth 100 points.

1. **6 pts**
Give the normal balance of: Supplies, Unearned Revenue (a liability), Owner's Drawing, Service Revenue, Insurance Expense, Notes Payable.
2. **4 pts**
What do the Latin roots of debit and credit mean, and how did merchants first use the words?

3. **12 pts**

Journalize for Pine Ridge Cleaning: Apr 1, owner invests \$3,000 cash. Apr 3, buys cleaning equipment for \$1,400, \$400 cash and the rest on account. Apr 9, cleans offices for \$950 cash. Apr 14, bills a client \$600. Apr 20, pays \$300 wages. Apr 28, receives \$600 from the client.

4. **8 pts**

Post Problem 3 and give the April 30 balance of each account.

5. **8 pts**

Prepare the trial balance for Problem 4.

6. **5 pts**

Explain the purpose of the posting reference column in both the journal and the ledger.

7. **6 pts**

Accounts Receivable begins at \$1,250 Dr. Postings: debit 840, credit 600, debit 310, credit 1,250. Give the running balances.

8. **5 pts**

A trial balance has debits \$31,480 and credits \$30,940. Give three possible single errors.

9. **6 pts**

Name four errors a trial balance cannot detect.

10. **6 pts**

Write the correcting entry: a \$350 payment for repairs was debited to Equipment.

11. **6 pts**

Write the correcting entry: the owner's \$800 personal withdrawal was recorded as Debit Salaries Expense, credit Cash. Effect on net income before correction?

12. **6 pts**

Write the correcting entry: a \$1,600 credit sale was recorded as Debit Accounts Receivable \$1,060, credit Service Revenue \$1,060.

13. **4 pts**

Prove that reversing the digits of a two-digit number changes it by a multiple of 9.

14. **4 pts**

What did Washington's war-expense account show about public trust, and which parts of a journal entry did it contain?

15. **14 pts**

Essay: Explain why bookkeepers cross out and initial errors instead of erasing them, and why Pacioli wanted ledgers numbered and stamped. Connect your answer to the audit trail in modern software and to Luke 16:10 or Proverbs 11:1.

ANSWER KEY

1. Debit, credit, debit, credit, debit, credit.
2. *Debere*, to owe; *credere*, to trust. They were first used for people: a customer who owed was a debtor (left side); one who was owed was a creditor (right side).
3. Apr 1 Dr Cash 3,000, Cr Capital 3,000. Apr 3 Dr Equipment 1,400, Cr Cash 400, Cr A/P 1,000. Apr 9 Dr Cash 950, Cr Cleaning Revenue 950. Apr 14 Dr A/R 600, Cr Cleaning Revenue 600. Apr 20 Dr Wages Expense 300, Cr Cash 300. Apr 28 Dr Cash 600, Cr A/R 600.
4. Cash $3,000 - 400 + 950 - 300 + 600 = 3,850$ Dr; A/R 0; Equipment 1,400 Dr; A/P 1,000 Cr; Capital 3,000 Cr; Cleaning Revenue 1,550 Cr; Wages Expense 300 Dr.
5. Debits: Cash $3,850 + \text{Equipment } 1,400 + \text{Wages } 300 = 5,550$. Credits: A/P $1,000 + \text{Capital } 3,000 + \text{Revenue } 1,550 = 5,550$.
6. It cross-references the books: the ledger PR shows the journal page, and the journal PR shows the account number, written after posting, so every amount can be traced and no line is skipped or posted twice.
7. 2,090; 1,490; 1,800; 550 Dr.
8. Difference \$540: a \$540 debit with no credit; a \$270 credit posted as a debit; a transposition or slide ($540 \div 9 = 60$), such as 710 written as 170, or 600 written as 60.
9. An omitted transaction; a duplicated transaction; a wrong amount on both sides; posting to the wrong account on the correct side; compensating errors (any four).
10. Debit Repairs Expense \$350; credit Equipment \$350.
11. Debit Drawing \$800; credit Salaries Expense \$800. Net income was understated by \$800.
12. Debit Accounts Receivable \$540; credit Service Revenue \$540.
13. $(10a + b) - (10b + a) = 9(a - b)$.
14. He refused a salary but kept exact, dated, explained accounts of public money and submitted them for settlement. It had dates, explanations and amounts (but not modern debit-credit columns).
15. A strong answer explains that visible corrections keep the full record, protect the bookkeeper from suspicion, and let others verify the books; that numbered, stamped pages prevented secret rewriting and made books acceptable as evidence; that modern software keeps an audit trail of changes for the same

reason; and ties faithfulness in small records or just weights to the honesty of the whole system.

PORTFOLIO PIECE: A MONTH OF REAL BOOKS

Keep a full month of double-entry books for a real activity (a small business, a club or ministry treasury, or your own earnings and spending, with a parent's permission), or for an invented business with at least 20 transactions. File a source document for every entry. Journalize, post to four-column ledger accounts, prepare a trial balance, and have a parent pick five transactions at random and trace them from source document to trial balance. Write a one-page reflection on what you learned and any errors you found and corrected.

LOOK FOR	WHAT IT MEANS
Source documents and journal	At least 20 transactions, each with a filed source document, correct accounts and amounts, and an explanation.
Ledger	All entries posted with posting references and correct running balances.
Trial balance	Properly headed, in chart order, balanced.
Audit trail	Five randomly chosen transactions trace cleanly from source to trial balance; all corrections crossed out with one line and initialed.
Reflection	Explains what the books show and what was learned from any errors.

2.1 DEBITS AND CREDITS: THE MERCHANT'S TRUST

OBJECTIVES

- State the debit and credit rules for assets, liabilities, owner's capital, drawing, revenue and expenses.
- Identify the normal balance of every type of account.
- Analyze transactions into debits and credits and explain the reasoning.

Warm-up. Look up the Latin words *debere* and *credere* (or read them in the key terms).

Write one sentence for each explaining how the meaning fits an account: what does a “debtor” do, and what does a “creditor” do?

WATCH

ACCOUNTING BASICS: Debits and Credits Explained

Accounting Stuff • 5:44

<https://www.youtube.com/watch?v=VhwZ9t2b3Zk>

WHEN TO WATCH

After the big idea. Pause at each account type and say the rule aloud before the presenter does.

BACKUP VIDEO

Debits and credits explained

The Finance Storyteller • 4:29

<https://www.youtube.com/watch?v=n-lCd3TZA8M>

Before the practice set, as a second approach to the rules.

KEY TERMS

debit

An entry on the left side of an account. From Latin *debere*, “to owe”: in a merchant's ledger, a customer's account was debited for what he owed. Debits increase assets, expenses and drawing.

credit

An entry on the right side of an account. From Latin *credere*, “to trust” or “believe”: a creditor trusted the merchant. Credits increase liabilities, capital and revenue.

normal balance

The side on which an account's increases are recorded, and so where its balance normally appears: debit for assets, expenses and drawing; credit for liabilities, capital and revenue.

contra account

An account with a balance opposite to the accounts it is grouped with, used to reduce them (for example, Accumulated Depreciation reduces Equipment; Lesson 3.2).

CORE IDEAS

The story. In 1532 Hans Holbein the Younger painted Georg Gisze, a merchant from Danzig working at the Steelyard, the London trading house of the Hanseatic League. Around him are the tools of trust: letters from partners in other cities, a seal, scales, and a note on the wall in his own motto, "No joy without sorrow." Trade among the Hanse cities ran largely on credit. A merchant in Danzig shipped grain to London and waited months to be paid; the London merchant shipped cloth back on the same terms. The word *credit* comes from the Latin *credere*, "to believe" or "to trust"; *debit* from *debere*, "to owe." Pacioli's journal marked the debtor with *Per* and the creditor with *A*.

How they figured it out. Merchants first used the words for people: in the account of a customer, what he owed was written on the left (he is a debtor), and what he paid on the right. Over time the same left-right pattern was applied to every account, including things (cash, cloth) and ideas (capital, profit). The rules follow from the accounting equation. Assets are on the left of the equation, so increases in assets go on the left (debit). Liabilities and equity are on the right, so their increases go on the right (credit). Revenue increases equity, so it is a credit; expenses and drawing decrease equity, so they are debits.

The big idea. Memorize this table and you will never be lost. **Assets:** increase with a debit, decrease with a credit, normal balance debit. **Liabilities:** increase with a credit, decrease with a debit, normal balance credit. **Owner's capital:** increase credit, normal credit. **Drawing:** increase debit, normal debit. **Revenue:** increase credit, normal credit. **Expenses:** increase debit, normal debit. A memory aid is **DEAD CLIC:** Debits increase Expenses, Assets and Drawing; Credits increase Liabilities, Income (revenue) and Capital. In every entry, total debits equal total credits.

In business today. A bank calls your deposit a “credit” to your account because, on the bank’s books, your deposit is a liability: the bank owes it to you. When you spend with a debit card, the bank debits (reduces) that liability. That is why bank language seems backward to many people; it is written from the bank’s side. Accountants everywhere use the same rules, so a bookkeeper in Ohio and one in Japan read each other’s ledgers.

Think it through. Debit is not “bad” and credit is not “good.” They are left and right. Paying a debt is a debit to a liability, and that is a very good thing to do.

PICTURE STUDY



Portrait of the Merchant Georg Gisze, Hans Holbein the Younger, 1532 · Oil on oak panel ·
Gemäldegalerie, Berlin

Image: [Wikimedia Commons](#), public domain

Georg Gisze was a merchant from Danzig working at the Steelyard, the Hanseatic League's trading house in London. Holbein painted every tool of his trade with great precision. The letters are addressed to Gisze in London, and a Latin note on the wall gives his age, 34, and the date.

Look closely

- Find the letter in his hands and the letters on the wall. Who might they be from?
- Find the scale, the seal and the keys. What would a merchant use each for?
- Find the inscription on the wall behind him.
- Find the vase of carnations. What does it add to the picture?

Talk about it

1. Trade across the North Sea ran on credit: goods shipped now, paid later. Which objects show trust between merchants?
2. If Gisze shipped cloth to Danzig on credit, which account would he debit in his books?

3. Why would a merchant want his portrait to show his letters and seal so clearly?

PROJECT

Debit and Credit Analysis Cards

You will make a set of transaction cards and analyze each into debits and credits until the rules are automatic.

You will need

- Twenty index cards
- Ledger notebook
- A timer

Steps

1. On a notebook page, copy the debit-credit rules table for the six account types, with normal balances.
2. On the front of each of twenty index cards write a transaction for a small business of your choosing: at least three each of owner investment or withdrawal, purchase for cash, purchase on account, revenue for cash, revenue on account, expense paid, payment of a liability and collection from a customer.
3. On the back write the analysis: each account, its type, increase or decrease, debit or credit, and the amount.
4. Shuffle the cards and analyze each aloud without looking at the back. Time yourself.
5. Check the backs. For every miss, write the transaction and the correct analysis in the notebook.
6. Repeat until you can do all twenty correctly in under five minutes.
7. Have a parent read you five cards at random and check your answers.
8. Write a paragraph explaining to a younger student why paying a debt is a debit.

Tips

- Always name the account type first. The type decides the side.
- If a transaction seems to need two debits and no credit, look again: something was given.

Check your work

- ☐ My twenty cards cover all eight kinds of transaction.
- ☐ I can analyze all twenty correctly in under five minutes.
- ☐ I can state the normal balance of every account type.

LEDGER NOTEBOOK

1. Draw the accounting equation and, under each part, a T-account with + and – on the correct sides.
2. Write DEAD CLIC and what each letter stands for.
3. Copy Worked Example 1 with the reason for each debit and credit.

KEY FORMULAS

Debit side: $A + \text{Drawing} + \text{Expenses}$ Credit side: $L + \text{Capital} + \text{Revenue}$

From history. The abbreviation Dr for debit is thought to come from the old English form “debtor,” and Cr from “creditor,” from the days when ledger accounts were written as personal accounts: “Cash, Dr.” meant that cash was debtor to the business.

WORKED EXAMPLES

Example 1. Give the debit and credit for each transaction of Hart Bicycle Repair and the reason: (a) repairs for a customer on account, \$400; (b) pays rent, \$700; (c) pays \$350 to a supplier on account; (d) owner withdraws \$500.

Show solution

1. (a) Accounts Receivable (asset) increases: debit \$400. Repair Revenue increases: credit \$400. Debit Accounts Receivable \$400; credit Repair Revenue \$400.
2. (b) Rent Expense increases: debit \$700. Cash (asset) decreases: credit \$700. Debit Rent Expense \$700; credit Cash \$700.
3. (c) Accounts Payable (liability) decreases: debit \$350. Cash decreases: credit \$350. Debit Accounts Payable \$350; credit Cash \$350.
4. (d) Drawing increases: debit \$500. Cash decreases: credit \$500. Debit Daniel Hart, Drawing \$500; credit Cash \$500.

Answer: (a) Dr A/R, Cr Revenue \$400; (b) Dr Rent Expense, Cr Cash \$700; (c) Dr A/P, Cr Cash \$350; (d) Dr Drawing, Cr Cash \$500.

Example 2. Accounts Payable shows credits of \$1,200, \$450 and \$800 and debits of \$900 and \$450. What is its balance, and is it normal?

Show solution

1. Credits: $1,200 + 450 + 800 = \$2,450$. Debits: $900 + 450 = \$1,350$.
2. Balance: $2,450 - 1,350 = \$1,100$ credit.
3. A liability's normal balance is a credit, so the balance is normal.

Answer: \$1,100 credit balance, normal for a liability.

Example 3. A student bookkeeper finds that Supplies has a \$75 credit balance. What does this mean, and what might have happened?

Show solution

1. Supplies is an asset with a normal debit balance. A credit balance would mean negative supplies, which is impossible.
2. Likely errors: a purchase of supplies was credited instead of debited, or supplies used were credited more than was ever bought (for example, an adjustment entered twice).
3. The bookkeeper should trace each entry in the account back to the journal and source documents.

Answer: An abnormal balance signals an error to investigate.

PRACTICE

1. **Easy** Give the normal balance of: Cash, Notes Payable, Fees Earned, Wages Expense, Owner's Drawing, Owner's Capital.

Show answer

Debit, credit, credit, debit, debit, credit.

2. **Easy** Which side increases an asset? A liability? Revenue?

Show answer

Debit; credit; credit.

3. Easy What do the Latin roots of debit and credit mean?

Show answer

Debere, to owe; *credere*, to trust or believe.

4. Medium Debit and credit: the business pays \$95 for advertising.

Show answer

Debit Advertising Expense \$95; credit Cash \$95.

5. Medium Debit and credit: the business receives \$1,800 cash from customers for services just performed.

Show answer

Debit Cash \$1,800; credit Service Revenue \$1,800.

6. Medium Debit and credit: the business collects \$250 from a customer billed last month.

Show answer

Debit Cash \$250; credit Accounts Receivable \$250.

7. Medium Debit and credit: the business borrows \$10,000 from a bank on a note.

Show answer

Debit Cash \$10,000; credit Notes Payable \$10,000.

8. **Hard** Cash has debits totaling \$14,250 and credits totaling \$9,860. Accounts Receivable has debits of \$3,100 and credits of \$3,400. Give each balance and comment.

Show answer

Cash \$4,390 debit (normal). A/R \$300 credit: abnormal for an asset, so an error (or a customer overpaid, which should be shown as a liability).

9. **Hard** Why does your bank “credit” your account when you deposit money?

Show answer

On the bank’s books your deposit is a liability (the bank owes you), and liabilities increase with credits.

10. **Hard** Explain, from the accounting equation, why expenses are increased by debits.

Show answer

Expenses reduce equity, and equity is decreased by debits; so increases in expenses are recorded as debits.

11. **Challenge** A business's owner says, "We had a lot of debits this month, so we must be in trouble." Write a short reply.

Show answer

Debits are only left-side entries. Many debits may mean more cash received, more assets bought or debts paid. Whether the business is doing well depends on revenue, expenses and balances, not the count of debits.

COMMON MISTAKES

- Thinking credit means good and debit means bad.
- Using a bank statement's language to decide the business's entry. The bank writes from its own side.
- Forgetting that expenses and drawing are debited even though they reduce equity.

Make it a game • Debit Credit Flash Duel. Make twelve cards, each naming an account such as Cash, Drawing, Service Revenue or Accumulated Depreciation. Flip one at a time against a timer. Say its normal balance, then whether a debit or a credit increases it. Wrong answers go to a second pile. Replay only that pile until it is empty, then race the clock on the full deck.

2.2 THE JOURNAL: GEORGE WASHINGTON'S ACCOUNT BOOKS

OBJECTIVES

- Record transactions in a general journal with date, accounts, posting reference, amounts and explanation.
- Use source documents as the evidence for each entry.
- Record simple and compound entries correctly.

Warm-up. Find a store receipt at home. List every piece of information on it. Which pieces would a bookkeeper need to record the purchase? Which would be needed later to prove it happened?

WATCH

How JOURNAL ENTRIES Work (in Accounting)

Accounting Stuff · 6:48

https://www.youtube.com/watch?v=Y-_Q3rANyxU

WHEN TO WATCH

After the big idea and before the worked examples.

BACKUP VIDEO

FA9 - Journal Entries Explained

Tony Bell · 18:26

<https://www.youtube.com/watch?v=MZPXC4v8NCU>

During the project, if you want a longer walk-through with many entries.

KEY TERMS

journal

The book of original entry: every transaction recorded in date order, with its debits and credits, before it is posted to the ledger.

journalizing

Recording a transaction in the journal.

source document

The paper or electronic evidence of a transaction: a receipt, invoice, check, bank record, deposit slip or contract.

general journal

A two-column journal (debit and credit) that can record any kind of transaction.

posting reference (PR)

A column in the journal where the account number is written when the entry is posted, so every amount can be traced.

CORE IDEAS

The story. George Washington kept careful accounts all his life, from his ledgers as a young surveyor to the books of Mount Vernon. When the Continental Congress made him commander-in-chief in June 1775, he refused a salary and asked only that his expenses be repaid. For eight years of war he kept an exact account of what he spent on the army's business (spies, travel, food for his staff, horses), with dates and explanations, much of it in his own hand. In 1783 he submitted the account to the Treasury, where it was examined and settled. His accounts survive in the Library of Congress and the National Archives, and they are still read as a model of a public servant giving an account of public money.

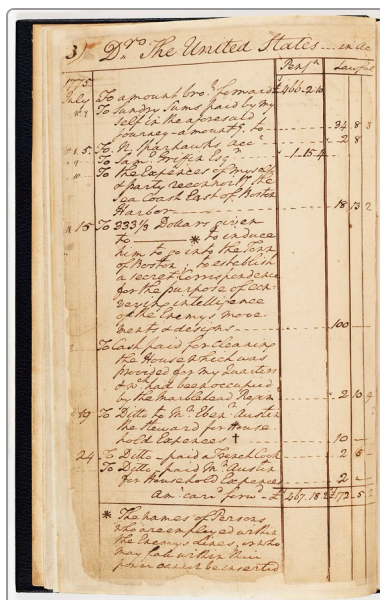
How they figured it out. Washington's method was the journal's method: write each event when it happens, in date order, with the amount and enough explanation that a stranger could understand it later. A **journal** is called the *book of original entry* because every transaction starts there. Each journal entry has the date; the account debited, written first and at the margin; the account credited, written below and indented; the amounts in the debit and credit columns; and a short explanation. The **source document** (receipt, invoice, check) is filed so the entry can be proved.

The big idea. The journal puts the whole of each transaction in one place. A ledger account shows only one side of many transactions; the journal shows both sides of one transaction together, so errors are easier to see and every entry can be traced. The standard format is: *Date | Account titles and explanation | PR | Debit | Credit*. Debits are listed first. For a **compound entry**, list all debits, then all credits. Leave the PR column blank until posting (Lesson 2.3).

In business today. Accounting software still keeps a journal, though most entries are made through screens (“Enter bill,” “Receive payment”) that create the journal entry behind the scenes. Every program can print the journal, and auditors read it to trace transactions back to their source documents. Specialized journals for sales, purchases, cash receipts and cash payments were once used to save labor; computers have made the general journal enough for most small businesses.

Try it. In the project you will journalize a month for a small music-lesson business. You will post the same entries in Lesson 2.3 and prepare its trial balance in Lesson 2.4, so keep your work.

PICTURE STUDY



A Page from George Washington's Accounts with the United States, George Washington, 1775–1783 · Ink on paper, manuscript account · National Archives, Washington

Image: Wikimedia Commons, public domain

Washington kept this account of the expenses he paid while commanding the Continental Army, and submitted it for settlement in 1783. Each line has a date, an explanation and an amount.

Look closely

- Find the dates. Are the entries in order?
- Read one explanation as well as you can. What was the money spent on?
- Find the money columns. How many columns are there, and why (pounds, shillings, pence)?
- Find a total at the bottom of a column.

Talk about it

1. Which parts of a modern journal entry can you find on this page? Which are missing?
2. Why would a commander who took no salary still keep such exact accounts?
3. What would an examiner at the Treasury have checked?

PROJECT

Journalize a Month for Maple Street Music Lessons

You will record a full month of transactions in a general journal. Keep this work: you will post it in Lesson 2.3 and prepare a trial balance in Lesson 2.4.

You will need

- Two-column journal paper or a ruled notebook page
- Calculator
- Optional: spreadsheet

Steps

1. Rule a journal page with columns: Date, Account Titles and Explanation, PR, Debit, Credit. Title it “General Journal, Page 1.”
2. Read the transactions: Maple Street Music Lessons, owned by Clara Moss, has these June transactions: Jun 1, Clara invests \$5,000 cash. Jun 2, pays June rent, \$1,200. Jun 3, buys a used piano for \$3,600, paying \$1,000 cash and signing a note for \$2,600. Jun 5, buys music books and supplies on account, \$340. Jun 10, receives \$1,450 cash for lessons given. Jun 15, bills students for lessons on account, \$620. Jun 18, pays the \$340 owed for supplies. Jun 22, pays the utility bill, \$135. Jun 25, collects \$400 from students billed on Jun 15. Jun 28, Clara withdraws \$600 for personal use. Jun 30, pays \$200 on the note (principal).
3. Use these accounts: Cash, Accounts Receivable, Supplies, Equipment, Accounts Payable, Notes Payable, Clara Moss Capital, Clara Moss Drawing, Lesson Fees Earned, Rent Expense, Utilities Expense.
4. Journalize each transaction: date, debit account at the margin, credit account indented, amounts, and a one-line explanation. Leave PR blank.
5. Skip a line between entries.
6. Total the debit column and the credit column. Both should be \$13,885.
7. Write a source document you would expect for each entry (for example, “lease and rent check” for Jun 2).

8. Rebuild the journal in a spreadsheet with a check cell that shows debits – credits for each entry.

Tips

- Read each transaction twice before writing: what was received, and what was given?
- Never erase. If you make a mistake, cross it out with one line and write the correction above.

Check your work

- ☐ My journal has eleven entries, each with equal debits and credits.
- ☐ My column totals are \$13,885 debit and \$13,885 credit.
- ☐ Every entry has an explanation and a named source document.

LEDGER NOTEBOOK

1. Copy one complete journal entry from the project and label each part.
2. List the source documents a small business should file every month.
3. Write two sentences on what Washington's accounts teach about public trust.

From history. Washington's expense account was printed in facsimile in 1833 and has been studied ever since. Historians still use it to learn what it cost to run an army headquarters in the War of Independence.

WORKED EXAMPLES

Example 1. Journalize the first five transactions of Hart Bicycle Repair for May: May 1, Daniel invests \$8,000 cash. May 2, buys equipment for \$3,000 cash. May 4, buys supplies on account, \$600 (invoice from Valley Supply). May 9, repairs for cash, \$1,200. May 12, repairs for a customer on account, \$400.

Show solution

1. May 1: Debit Cash \$8,000; credit Daniel Hart, Capital \$8,000. Explanation: owner's investment.
2. May 2: Debit Equipment \$3,000; credit Cash \$3,000. Explanation: bought tools and work stand.
3. May 4: Debit Supplies \$600; credit Accounts Payable \$600. Explanation: supplies on account, Valley Supply invoice.
4. May 9: Debit Cash \$1,200; credit Repair Revenue \$1,200. Explanation: cash repairs.
5. May 12: Debit Accounts Receivable \$400; credit Repair Revenue \$400. Explanation: repairs billed on account.

Answer: Five entries, each with equal debits and credits; journal totals \$13,200 debit and \$13,200 credit.

Example 2. Continue Hart Bicycle Repair: May 15, pays rent, \$700. May 20, pays Valley Supply \$350 on account. May 25, collects \$250 from the customer billed May 12. May 31, Daniel withdraws \$500.

Show solution

1. May 15: Debit Rent Expense \$700; credit Cash \$700.
2. May 20: Debit Accounts Payable \$350; credit Cash \$350.
3. May 25: Debit Cash \$250; credit Accounts Receivable \$250.
4. May 31: Debit Daniel Hart, Drawing \$500; credit Cash \$500.
5. Journal totals for all nine May entries: $13,200 + 700 + 350 + 250 + 500 = \$15,000$ debit and \$15,000 credit.

Answer: Four more balanced entries; the month's journal totals \$15,000 on each side.

Example 3. Journalize this compound entry: on June 3, Maple Street Music Lessons buys a used piano for \$3,600, paying \$1,000 cash and signing a note for \$2,600.

Show solution

1. Debits first: Equipment (Piano) \$3,600.
2. Then credits, indented: Cash \$1,000; Notes Payable \$2,600.
3. Check: $3,600 = 1,000 + 2,600$.
4. Explanation: bought used piano, \$1,000 down, note for balance.

Answer: Debit Equipment \$3,600; credit Cash \$1,000; credit Notes Payable \$2,600.

PRACTICE

1. Easy Why is the journal called the book of original entry?

Show answer

Every transaction is recorded there first, before it is posted to the ledger.

2. Easy List the parts of a general journal entry.

Show answer

Date, account debited, account credited (indented), posting reference, debit amount, credit amount, explanation.

3. Easy Name four kinds of source documents.

Show answer

Sample: receipt, sales invoice, purchase invoice (bill), check, deposit slip, bank statement, contract, time card.

4. Medium Journalize: Mar 3, pays \$450 for a one-month newspaper advertisement.

Show answer

Debit Advertising Expense \$450; credit Cash \$450.

5. Medium Journalize: Mar 8, completes work for a client and bills her \$2,300.

Show answer

Debit Accounts Receivable \$2,300; credit Service Revenue \$2,300.

6. **Medium** Journalize: Mar 12, buys a computer for \$1,900, paying \$400 cash and the rest on account.

Show answer

Debit Equipment \$1,900; credit Cash \$400; credit Accounts Payable \$1,500.

7. **Medium** Journalize: Mar 20, receives \$1,000 from the client billed Mar 8.

Show answer

Debit Cash \$1,000; credit Accounts Receivable \$1,000.

8. **Hard** Journalize: Mar 31, the owner takes home a \$300 printer that belonged to the business.

Show answer

Debit Owner's Drawing \$300; credit Equipment \$300.

9. **Hard** Journalize: Mar 31, the business pays \$1,250 on a note: \$1,150 of principal and \$100 of interest.

Show answer

Debit Notes Payable \$1,150; debit Interest Expense \$100; credit Cash \$1,250.

10. **Hard** Why did Washington keep explanations with each amount rather than only totals?

Show answer

So that anyone examining the account later could see what each amount was for, verify it and trust the total.

11. **Challenge** A journal for the month has debit total \$24,380 and credit total \$24,830. What kind of error is likely, and what would you check first?

Show answer

The difference is \$450, which is divisible by 9 ($450 \div 9 = 50$), suggesting a transposition (for example 2,380 written as 2,830) or a slide. Check each entry for unequal debits and credits, especially amounts containing the digits involved.

COMMON MISTAKES

- Writing the credit first or failing to indent it.

- Leaving out the explanation. Months later no one will remember what the entry was for.
- Recording a payment on account as an expense. The expense (or asset) was recorded when the bill was received.

Make it a game · Source Document Hunt. Find three real source documents around the house, such as a receipt, a utility bill or a packing slip. For each, write a proper general journal entry with the date, accounts, amounts and a one-line explanation, as Washington did in his account books. Your parent judges which entries have solid evidence behind them. Score a point for every entry that balances.

2.3 POSTING TO THE LEDGER

OBJECTIVES

- Post journal entries to four-column (balance-form) ledger accounts with dates, posting references and running balances.
- Use posting references to cross-reference the journal and ledger.
- Find each account's balance and confirm it is on the normal side.

Warm-up. A journal lists transactions by date. Suppose your parent asks, “How much cash do we have right now?” How would you answer from a journal alone? Write the steps. Why is that slow?

WATCH

GENERAL LEDGER: Visual Guide to Posting Journals

Accounting Stuff • 9:36

<https://www.youtube.com/watch?v=Fu8zGee1SZw>

WHEN TO WATCH

After the big idea. Follow one entry from the journal to both ledger accounts.

BACKUP VIDEO

T Accounts Explained SIMPLY (With 5 Examples)

Accounting Stuff • 11:08

<https://www.youtube.com/watch?v=kA9snSvCgW8>

Before the practice set, to practice reading balances in T-accounts.

KEY TERMS

posting

Transferring each amount from the journal to the debit or credit side of the ledger account named.

general ledger

The complete set of accounts of a business, kept in chart-of-accounts order.

four-column (balance-form) account

A ledger account with columns for Date, Item, PR, Debit, Credit, and Balance (debit balance and credit balance), so a running balance is shown after every posting.

cross-referencing

Writing the journal page (for example J1) in the ledger's PR column and the account number in the journal's PR column, so every amount can be traced both ways.

CORE IDEAS

The story. In 1532, the same year he painted Georg Gisze, Holbein painted another Steelyard merchant, Hermann von Wedigh of Cologne. Wedigh sits with a small book closed under his hand, a slip of paper tucked between its pages. Merchants like him kept their ledgers in heavy bound books with numbered pages, one or more for each account: a page for each trading partner, each kind of goods, cash and capital. The word *ledger* probably comes from the Middle English *legger*, a book that “lies” permanently in one place, as opposed to the journal and papers that moved about.

How they figured it out. Pacioli told merchants to post every journal entry to the ledger twice, once to the debit account and once to the credit account, and to write in each place where the other half could be found. He also told them to number the journal and ledger pages and mark each posting, so that no entry could be skipped or posted twice. That is the origin of the **posting reference**: the ledger shows the journal page, and the journal shows the ledger account number. Every number can be traced from source document to journal to ledger and back.

The big idea. The journal organizes transactions by date; the **ledger** organizes them by account. To post: (1) find the ledger account named in the journal; (2) write the date, the journal page in PR, and the amount in the debit or credit column; (3) compute the new balance; (4) write the account number in the journal's PR column to show the line has been posted. The **four-column account** keeps a running balance, so the balance of Cash, Accounts Receivable or any account can be read at any moment. A T-account is the same thing in sketch form, useful for quick analysis.

In business today. Software posts automatically the moment an entry is saved, and a click on any ledger amount opens the journal entry behind it: the same cross-reference Pacioli required, done by computer. But the bookkeeper still needs to understand posting to find errors, to read a ledger report and to explain to an auditor how each balance was built.

Think it through. Writing the account number in the journal's PR column only after posting is a small habit with a big purpose: if you are interrupted, you can see exactly where you stopped.

PICTURE STUDY



Hermann von Wedigh III, Hans Holbein the Younger, 1532 · Oil and gold on oak · Metropolitan Museum of Art, New York

Image: [Wikimedia Commons](#), public domain

Hermann von Wedigh came from a Cologne merchant family active at the Steelyard in London. His small book, his signet ring and the sober black clothes are the marks of a careful merchant. The paper tucked into the book carries a Latin motto.

Look closely

- Find the book under his hand. Is it open or closed? What is tucked inside?
- Find the inscription on the wall behind him and the date.
- Look at his ring. What would a merchant use a signet ring for?
- Compare his clothes with Georg Gisze's. What is different?

Talk about it

1. A merchant's ledger was a valuable, permanent book. Why might he be painted with his hand resting on it?
2. How might a merchant prove to a partner that a ledger had not been altered?
3. What does the plain background make you notice?

PROJECT

Post the Month for Maple Street Music Lessons

You will post your Lesson 2.2 journal to four-column ledger accounts and find every balance.

You will need

- Your journal from Lesson 2.2
- Four-column ledger paper (eleven accounts) or a spreadsheet

Steps

1. Open eleven ledger accounts in chart order and number them: 101 Cash, 111 Accounts Receivable, 141 Supplies, 181 Equipment, 201 Accounts Payable, 211 Notes Payable, 301 Clara Moss Capital, 302 Clara Moss Drawing, 401 Lesson Fees Earned, 511 Rent Expense, 521 Utilities Expense.
2. Post the journal one line at a time: date, J1 in the ledger PR column, amount on the correct side, new running balance.
3. After each line, write the account number in the journal's PR column.
4. When finished, check that every journal line has a PR number.
5. List each account's final balance and its side.
6. Check against these answers: Cash \$3,375 Dr; Accounts Receivable \$220 Dr; Supplies \$340 Dr; Equipment \$3,600 Dr; Accounts Payable \$0; Notes Payable \$2,400 Cr; Capital \$5,000 Cr; Drawing \$600 Dr; Lesson Fees Earned \$2,070 Cr; Rent Expense \$1,200 Dr; Utilities Expense \$135 Dr.
7. For any difference, trace the account back to the journal using the PR column and correct it with a single line through it and initials.
8. If you use GnuCash, enter the same eleven entries and compare its account register with your ledger.

Tips

- Post one journal line completely (ledger and PR) before starting the next.
- Write balances in the correct balance column so an abnormal balance stands out.

Check your work

- ☐ Every journal line is posted and has a PR number.
- ☐ All eleven balances match the answers, each on its normal side or zero.
- ☐ I can trace any ledger amount back to its journal entry.

LEDGER NOTEBOOK

1. Draw an arrow diagram: source document → journal (PR = account number) → ledger (PR = J1).
2. Copy Hart's four-column Cash account from Worked Example 1.
3. Write the four steps of posting in your own words.

From history. In large firms before computers, posting was the work of rooms full of clerks. Banks hired “ledger clerks” who posted every deposit and check by hand; mechanical posting machines from Burroughs and NCR began to replace them in the early 1900s.

WORKED EXAMPLES

Example 1. Post the Cash entries for Hart Bicycle Repair's May journal (page J1) to a four-column Cash account, number 101, with running balances.

Show solution

1. May 1, J1, debit 8,000: balance 8,000 Dr.
2. May 2, J1, credit 3,000: balance 5,000 Dr.
3. May 9, J1, debit 1,200: balance 6,200 Dr.
4. May 15, J1, credit 700: balance 5,500 Dr.
5. May 20, J1, credit 350: balance 5,150 Dr.
6. May 25, J1, debit 250: balance 5,400 Dr.
7. May 31, J1, credit 500: balance 4,900 Dr.
8. Write 101 in the journal's PR column beside each Cash line.

Answer: Cash has a \$4,900 debit balance on May 31.

Example 2. Post Hart's entries to Accounts Receivable (111), Accounts Payable (201) and Repair Revenue (401) and give each balance.

Show solution

1. Accounts Receivable: May 12 debit 400, balance 400 Dr; May 25 credit 250, balance 150 Dr.
2. Accounts Payable: May 4 credit 600, balance 600 Cr; May 20 debit 350, balance 250 Cr.
3. Repair Revenue: May 9 credit 1,200, balance 1,200 Cr; May 12 credit 400, balance 1,600 Cr.

Answer: A/R \$150 Dr; A/P \$250 Cr; Repair Revenue \$1,600 Cr, each on its normal side.

Example 3. A bookkeeper finds the journal's PR column blank beside the May 20 entry and the May 25 entry, but filled for all others. What should she do?

Show solution

1. Blank PR means the line has not been posted (or the posting was not marked).
2. Check the ledger accounts for May 20 and May 25 amounts. If they are missing, post them now: Accounts Payable debit 350 and Cash credit 350 (May 20); Cash debit 250 and Accounts Receivable credit 250 (May 25).
3. If they are already in the ledger, simply write the account numbers in the PR column. Never post them twice.

Answer: Check the ledger first, post only what is missing, then fill in the PR column.

PRACTICE

1. Easy What is the difference between the journal and the ledger?

Show answer

The journal records transactions by date with both sides together; the ledger collects them by account.

2. **Easy** What goes in the ledger's PR column? In the journal's PR column?

Show answer

Ledger: the journal page (e.g., J1). Journal: the account number, written after posting.

3. **Easy** Name the columns of a four-column account.

Show answer

Date, Item, PR, Debit, Credit, Balance (Debit and Credit balance columns).

4. **Medium** Cash starts the month at \$2,400 Dr. Postings: debit 650, credit 1,100, credit 300, debit 900. Give the running balances.

Show answer

3,050; 1,950; 1,650; 2,550 Dr.

5. **Medium** Accounts Payable starts at \$800 Cr. Postings: credit 450, debit 800, credit 275. Final balance?

Show answer

\$725 Cr.

6. **Medium** Why did Pacioli tell merchants to number their ledger pages?

Show answer

So entries could be cross-referenced and no page could be removed or added without notice.

7. **Medium** A journal entry debits Supplies \$220 and credits Accounts Payable \$220. Which two ledger accounts change, and on which sides?

Show answer

Supplies, debit side; Accounts Payable, credit side.

8. **Hard** Repair Revenue shows a balance of \$3,640 Cr after these postings this month: credits 1,200, 980, 1,460. What was its beginning balance?

Show answer

$3,640 - 3,640 = \$0$. (Revenue starts each period at zero; the credits total exactly \$3,640.)

9. **Hard** An entry debiting Rent Expense \$700 was posted as a debit to Rent Expense and a debit to Cash. What will the trial balance show?

Show answer

Debits will exceed credits by \$1,400 (Cash got a \$700 debit instead of a \$700 credit).

10. **Hard** Why is a running balance useful compared with a T-account totaled only at month-end?

Show answer

It shows the balance after every transaction, so the owner can see cash on hand at any date and spot an overdraft or abnormal balance at once.

11. **Challenge** Using Hart's May journal, give the balance of every account. Which have debit balances and which credit?

Show answer

Debit: Cash 4,900; A/R 150; Supplies 600; Equipment 3,000; Drawing 500; Rent Expense 700. Credit: A/P 250; Capital 8,000; Repair Revenue 1,600.

COMMON MISTAKES

- Posting to the wrong side of the account.
- Forgetting to write the PR number, so lines are skipped or posted twice.
- Computing the running balance by adding a credit to a debit balance.

Make it a game • Post and Catch. Your parent writes six journal entries and posts them to four-column ledger accounts, deliberately placing one error in a running balance. You then check the posting references and re-add every balance. Find the error within three minutes to score. Then swap roles and plant your own error. Explain how posting references cross-reference the journal and ledger.

2.4 THE TRIAL BALANCE

OBJECTIVES

- Prepare a trial balance from ledger balances in chart-of-accounts order.
- Explain what a trial balance proves and what it does not prove.
- Use the trial balance difference to begin finding errors.

Warm-up. Add these numbers in your head or on paper, then add them again in a different order: 4,900; 150; 600; 3,000; 500; 700. Did you get the same answer both times? Why do careful clerks add a column twice?

WATCH

The TRIAL BALANCE Explained (Full Example!)

Accounting Stuff • 7:36

https://www.youtube.com/watch?v=3_PfoTzSCQE

WHEN TO WATCH

After the big idea and before the worked examples.

BACKUP VIDEO

TRIAL BALANCE vs BALANCE SHEET

Accounting Stuff • 6:36

<https://www.youtube.com/watch?v=q7Nhj8vDD8M>

After the practice set, to see how the trial balance differs from a balance sheet.

KEY TERMS

trial balance

A list of every ledger account and its balance at one date, with debit balances in one column and credit balances in another, whose totals must be equal.

footing

Adding a column of numbers; the total is written in small figures beneath it.

unadjusted trial balance

The trial balance prepared from the ledger before end-of-period adjusting entries (Unit 3).

compensating error

Two errors that offset each other so the trial balance still balances.

CORE IDEAS

The story. In 1796 a Bristol bookkeeper, Edward Thomas Jones, published *Jones's English System of Book-keeping*, claiming it was simpler and more reliable than the “Italian” double-entry method. He sold thousands of copies by subscription and attacked double entry as a way to hide errors. Experienced merchants and accountants soon pointed out that his system lacked the very check that made double entry valuable: in double entry the sum of the debits must equal the sum of the credits, so a clerk can test his whole ledger in an hour. Jones himself later reworked his system to use double entry.

How they figured it out. Merchants had always added up their ledgers before closing them. Pacioli described listing all the balances on a sheet, debits on one side and credits on the other, to see whether they agreed before the books were carried forward. Later English and American textbooks called this the **trial balance**: a trial, or test, of the ledger before any statements are made from it.

The big idea. To prepare a trial balance: (1) find the balance of every account; (2) list the accounts in chart order with each balance in the Debit or Credit column; (3) total both columns; (4) compare. If the totals are equal, the ledger is arithmetically in balance. That proves that equal debits and credits were posted, but it does *not* prove the books are correct. A trial balance will not catch a transaction never recorded, one recorded twice, a wrong amount entered on both sides, a debit or credit to the wrong account of the right side, or compensating errors. If the totals differ, there is at least one error, and the size of the difference is a clue (Lesson 2.5).

In business today. Software produces a trial balance in seconds and will not let unequal entries be saved, so modern trial balances almost always balance. Accountants still print one at every month-end because it is the starting point for adjusting entries and statements, and because reading down it is the quickest way to spot an abnormal balance or an amount that looks wrong. Auditors begin with the client's trial balance.

Think it through. “A just weight is his delight.” The trial balance is the bookkeeper’s scale: the debits on one pan, the credits on the other. A balanced scale is the start of honesty, not the end of it.

PICTURE STUDY



The Account Keeper, Nicolaes Maes, 1656 · Oil on canvas · Saint Louis Art Museum

Image: [Wikimedia Commons](#), public domain

Maes, a pupil of Rembrandt, painted a Dutch housekeeper or mistress of a house who has fallen asleep over her accounts. The keys on the wall were a sign of a household entrusted to her care.

Look closely

- Find the open account book and the pen.
- Is she awake? What tells you?
- Find the keys and the papers on the wall.
- Find the world map. What might it say about the household’s business?

Talk about it

1. Totaling long columns by hand was tiring work. What does the painting suggest about the risk of errors?
2. Why would a careful bookkeeper add each column twice?
3. The keys show trust. How is keeping accounts a form of trust in a household?

PROJECT

Trial Balance and a Spreadsheet Check

You will prepare the June 30 trial balance for Maple Street Music Lessons by hand and in a spreadsheet, and test what it can and cannot catch.

You will need

- Your ledger from Lesson 2.3
- Two-column paper
- Spreadsheet

Steps

1. Head the page with three lines: Maple Street Music Lessons / Trial Balance / June 30, 20—.
2. List all eleven accounts in chart order (include Accounts Payable with a zero balance or omit it, and say which you chose).
3. Enter each balance in the Debit or Credit column, foot both columns, and double-rule the totals.
4. Check: totals should be \$9,470 each.
5. Build the same trial balance in a spreadsheet with a cell that computes debits – credits.
6. Test it: change the Utilities Expense amount to \$153 (a transposition) and note the difference. Divide by 9.
7. Restore it, then “forget” the Jun 25 collection (remove \$400 from Cash and add \$400 back to Accounts Receivable). Does the trial balance still balance? What does that show?
8. Write a paragraph: what the trial balance proved about your books, and two errors it could not have caught.

Tips

- Use a ruler to keep the columns aligned; misaligned digits cause addition errors.
- Single-rule above a total, double-rule below a final total.

Check your work

- ☐ My trial balance is properly headed, in chart order, and totals \$9,470 on both sides.
- ☐ I can explain why the transposition changed the totals by \$18 (a multiple of 9) and the forgotten collection did not change them at all.
- ☐ I can name at least three errors a trial balance cannot detect.

LEDGER NOTEBOOK

1. Copy Hart's trial balance with its three-line heading and double-ruled totals.
2. Draw a balance scale with debit balances on one pan and credit balances on the other.
3. List the errors a trial balance cannot catch.

KEY FORMULAS

Total debit balances = Total credit balances

From history. Before adding machines, clerks checked their footing by “casting” each column twice, upward and downward. The Burroughs adding machine, patented by William S. Burroughs in 1888, and the Comptometer of the same years made long columns of figures quicker and more reliable.

WORKED EXAMPLES

Example 1. Prepare Hart Bicycle Repair's trial balance at May 31 from its ledger.

Show solution

1. Debit column: Cash 4,900; Accounts Receivable 150; Supplies 600; Equipment 3,000; Daniel Hart, Drawing 500; Rent Expense 700.
2. Credit column: Accounts Payable 250; Daniel Hart, Capital 8,000; Repair Revenue 1,600.
3. Debit total: $4,900 + 150 + 600 + 3,000 + 500 + 700 = \$9,850$.
4. Credit total: $250 + 8,000 + 1,600 = \$9,850$.

Answer: Hart Bicycle Repair, Trial Balance, May 31: totals $\$9,850 = \$9,850$.

Example 2. A trial balance shows debits of \$47,320 and credits of \$46,420. List the possible single errors suggested by the difference.

Show solution

1. Difference = $47,320 - 46,420 = \$900$.
2. A \$900 amount may have been posted to only one side, or omitted from the credit column.
3. Half the difference is \$450: a \$450 credit may have been posted as a debit.
4. $900 \div 9 = 100$: a transposition or slide is possible (for example, \$1,000 written as \$100 would differ by \$900).

Answer: Look for a \$900 one-sided posting, a \$450 credit posted as a debit, or a transposition/slide.

Example 3. Hart's trial balance balances. Later the owner discovers that a \$180 cash repair job was never recorded, and a \$90 utility bill was recorded as Rent Expense. What do these mean for the trial balance?

Show solution

1. The omitted \$180 sale affects neither column, so the trial balance still balanced; Cash and Repair Revenue are both understated by \$180.
2. The \$90 utilities misclassified as rent is a debit to the wrong expense account; total debits are unchanged.
3. Both errors must be corrected with journal entries even though the trial balance balanced: Debit Cash \$180; credit Repair Revenue \$180. and Debit Utilities Expense \$90; credit Rent Expense \$90.

Answer: The trial balance could not detect either error; both need correcting entries.

PRACTICE

1. Easy What does a balanced trial balance prove?

Show answer

That total debits equal total credits in the ledger; it does not prove every entry is correct.

2. Easy In what order are accounts listed on a trial balance?

Show answer

Chart-of-accounts order: assets, liabilities, equity (capital, drawing), revenue, expenses.

3. Easy Name three errors a trial balance will not reveal.

Show answer

Sample: an omitted transaction, a transaction recorded twice, a wrong amount on both sides, posting to the wrong account on the correct side, compensating errors.

4. Medium Prepare a trial balance: Cash 2,800; Accounts Payable 1,100; Capital 6,000; Equipment 4,500; Fees Earned 3,900; Supplies 400; Wages Expense 2,600; Drawing 700. Do the totals agree?

Show answer

Debits: $2,800 + 4,500 + 400 + 2,600 + 700 = 11,000$. Credits: $1,100 + 6,000 + 3,900 = 11,000$. Yes.

5. Medium Prepare the June 30 trial balance for Maple Street Music Lessons from your Lesson 2.3 ledger.

Show answer

Debits: Cash 3,375; A/R 220; Supplies 340; Equipment 3,600; Drawing 600; Rent 1,200; Utilities 135 = 9,470. Credits: Notes Payable 2,400; Capital 5,000; Fees 2,070 = 9,470.

6. Medium Debits total \$18,640 and credits \$18,460. What is the difference, half the difference, and the difference $\div 9$?

Show answer

\$180; \$90; \$20.

7. Medium Why is the trial balance prepared before the financial statements?

Show answer

To test the ledger's arithmetic and spot abnormal balances before statements are built from it.

8. **Hard** A \$520 payment on account was journalized correctly but posted as a credit to Accounts Payable instead of a debit. Effect on the trial balance?

Show answer

Credits exceed debits by \$1,040.

9. **Hard** A \$760 credit sale was omitted entirely. Effect on the trial balance and on the accounts?

Show answer

Trial balance still balances; Accounts Receivable and Revenue are each understated by \$760.

10. **Hard** How did critics answer Edward Jones's claim that his single-entry "English system" was better than double entry?

Show answer

They showed it lacked double entry's built-in check that debits equal credits, so errors could hide undetected.

11. **Challenge** A trial balance balances at \$62,000. Then two errors are found: a \$400 debit to Supplies should have been to Equipment, and a \$300 cash sale was recorded twice. What are the corrected trial balance totals?

Show answer

Reclassifying \$400 between two debit accounts changes nothing. Removing the duplicate \$300 lowers both Cash (debit) and Revenue (credit) by \$300.

Corrected totals: \$61,700 each.

COMMON MISTAKES

- Listing an account's balance in the wrong column.
- Leaving out an account, often Drawing or one with a small balance.
- Believing that a balanced trial balance means the books are correct.

Make it a game • The Missing Balance. Your parent lists eight account balances from a pretend small business, hiding one number. Work out the missing balance that makes total debits equal total credits, in chart-of-accounts order. Then answer: what does a balanced trial balance prove, and name one error it cannot detect, such as a compensating error. Trade roles and set your parent a puzzle.

Scripture. “A false balance is abomination to the LORD: but a just weight is his delight.” (Proverbs 11:1, KJV)

A merchant’s balance had to weigh true. A trial balance is a bookkeeper’s scale, and keeping it true is part of honest dealing.

2.5 FINDING AND CORRECTING ERRORS

OBJECTIVES

- Use the difference in a trial balance to locate errors: one-sided postings, reversed postings, transpositions and slides.
- Prepare correcting entries for errors found after posting.
- Follow the rules of honest correction: cross out with one line, never erase.

Warm-up. Write the number 3,825 and swap two neighboring digits to make 3,285. Subtract the smaller from the larger. Now try 642 and 462, and 71 and 17. Divide each difference by 9. What do you notice?

WATCH

FA12 - The Trial Balance Example

Tony Bell · 6:41

https://www.youtube.com/watch?v=lpJy-P_eg9A

WHEN TO WATCH

Before the worked examples; it shows a trial balance being built and checked.

KEY TERMS

transposition

An error in which two digits are reversed, such as 540 written as 450. The difference is always divisible by 9.

slide

An error in which the decimal point is moved, such as 1,250 written as 125. The difference is also divisible by 9.

correcting entry

A journal entry made to fix an error that has already been posted, so the ledger shows both the error and its correction.

audit trail

The chain of records that lets anyone trace a transaction from source document to journal, ledger and statements, including every correction.

CORE IDEAS

The story. Pacioli told merchants that before they began a new journal and ledger, they should take the books to the merchants' office of their city, where an official numbered the pages and marked them with the date and his name, so that no page could be added or removed. A bound, numbered book could not be quietly

rewritten. When a clerk made an error, he did not tear out the page or scrape away the ink; he made a new entry that reversed or corrected the old one, so the record showed both. Merchants' courts in Italian cities accepted such books as evidence in lawsuits because they could be trusted.

How they figured it out. Long experience taught clerks patterns. If the trial balance is off by an amount that appears in the journal, an entry may have been posted to one side only. If it is off by twice an amount, a debit was probably posted as a credit (or the reverse): divide the difference by 2 and look for that number. If the difference divides evenly by 9, look for a **transposition** (digits reversed: 540 for 450) or a **slide** (decimal moved: 125 for 1,250). Why 9? Reversing two neighboring digits a and b changes the value by $9 \times (a - b)$ times a place value, and moving the decimal multiplies by 10, 100 or 1,000, which changes the value by 9, 99 or 999 times the smaller number.

The big idea. Find errors systematically: (1) re-add the trial balance; (2) check that every balance was copied correctly from the ledger and into the right column; (3) recompute the ledger balances; (4) trace each posting from the journal; (5) check each journal entry for equal debits and credits. Use the difference clues to know what to look for. Correct errors honestly. Before posting, draw a single line through the wrong figure, write the correct figure above it and initial it. After posting, make a **correcting entry** in the journal: work out what was recorded, what should have been recorded, and record the difference.

In business today. Accounting software usually prevents one-sided entries, so most modern errors are wrong accounts, wrong amounts or missing transactions, which the trial balance cannot catch. They are found by reconciling accounts to outside evidence (bank statements, supplier statements, inventory counts) and by review. Every legitimate system keeps an **audit trail**: a deleted or changed entry leaves a record. A bookkeeper who erases or deletes errors to make the books look clean destroys the trail and invites suspicion of fraud.

Think it through. Small errors matter. A habit of carelessness with \$9 grows into carelessness with \$9,000, and honesty in little things is the training for honesty in great ones.

PICTURE STUDY



The Moneychanger and His Wife, Marinus van Reymerswaele, 1539 · Oil on panel · Museo del Prado, Madrid

Image: [Wikimedia Commons](#), public domain

Reymerswaele painted this subject many times, after Matsys. The husband weighs and counts; the wife follows the entries in the account book. Two people are checking the same transaction.

Look closely

- Find the scale and the coins.
- Find the account book. Whose finger is on the page?
- Find the papers and objects on the shelf behind.
- Where is each person looking?

Talk about it

1. How does the wife's checking of the book help catch errors?
2. Why is it harder to make an error, or to cheat, when two people work together?
3. What would you check first if the coins on the table did not match the total in the book?

PROJECT

Error Detective

A parent or friend will plant errors in a copy of your Maple Street books. You will find and correct them using the methods in this lesson.

You will need

- A photocopy or spreadsheet copy of your journal, ledger and trial balance from Lessons 2.2–2.4
- A helper
- Red pen for corrections

Steps

1. Give your helper this list of possible errors to plant (three or four of them, without telling you which): a transposed amount in a posting; a slide; a credit posted as a debit; an entry to the wrong account; a balance copied into the wrong column of the trial balance; an omitted entry.
2. Receive the altered books and prepare a new trial balance from the altered ledger.
3. Compute the difference, half the difference, and the difference $\div 9$. Write what each suggests.
4. Follow the five-step search: re-add; recheck copying; recompute ledger balances; trace postings; check each journal entry.
5. Correct each error found before posting with a single line through it, the right figure above and your initials.
6. For any error that would have been posted to the real books, write a correcting journal entry.
7. Ask your helper which errors were planted. Which did the trial balance reveal and which did not?
8. Write a half-page report: the errors, how you found each, and which errors would need an outside check (a bank statement, a customer's statement) to catch.

Tips

- Work from the biggest clue first: the size of the difference.
- Keep a list of what you have checked so you do not check the same thing twice.

Check your work

- ☐ I found every planted error that changes the trial balance totals.
- ☐ My corrections are crossed out with one line and initialed, not erased.
- ☐ My correcting entries have equal debits and credits and fix the accounts exactly.

LEDGER NOTEBOOK

1. Make a table of error clues: difference equals an amount; difference equals twice an amount; difference divisible by 9.
2. Write the algebra proof that a transposition difference is a multiple of 9.
3. Copy one correcting entry with “recorded,” “should have been” and “correction” lines.

From history. The English word “audit” comes from the Latin *audire*, “to hear”: medieval accounts were read aloud to the lord or his officers, who listened for anything wrong. The listener became the auditor.

WORKED EXAMPLES

Example 1. A trial balance shows debits \$12,470 and credits \$12,560. Find the error.

Show solution

1. Difference: $12,560 - 12,470 = \$90$.
2. Is there a \$90 amount in the journal? No. Half the difference is \$45; is there a \$45 entry? No.
3. $90 \div 9 = 10$: look for a transposition of neighboring digits that differ by 1 in the tens place (for example 540 and 450, or 1,230 and 1,320).
4. Checking the ledger: Utilities Expense was posted as \$450 though the journal shows \$540. Debits are \$90 too low.

Answer: Correct the posting to \$540; both totals become \$12,560.

Example 2. Debits exceed credits by \$1,125 on a trial balance. The journal includes a \$1,250 credit to Service Revenue. What error is likely?

Show solution

1. $1,125 \div 9 = 125$, so a slide is possible.
2. If the \$1,250 credit to Service Revenue was posted as \$125, credits would be $1,250 - 125 = \$1,125$ too low.
3. Check the Service Revenue account; correct the posting to \$1,250.

Answer: A slide: \$1,250 posted as \$125.

Example 3. After posting, Maple Street Music discovers that the \$135 utility payment on Jun 22 was debited to Rent Expense. Write the correcting entry.

Show solution

1. Recorded: Debit Rent Expense \$135; credit Cash \$135.
2. Should have been: Debit Utilities Expense \$135; credit Cash \$135.
3. Cash is correct. Move the \$135 from Rent Expense to Utilities Expense.

Answer: Debit Utilities Expense \$135; credit Rent Expense \$135.

Example 4. A \$600 withdrawal by the owner was recorded as Debit Wages Expense \$600; credit Cash \$600, and posted. Write the correcting entry and explain its effect on net income.

Show solution

1. Should have been: Debit Drawing \$600; credit Cash \$600.
2. Correction: Debit Owner's Drawing \$600; credit Wages Expense \$600.
3. Before the correction, expenses were overstated by \$600, so net income was understated by \$600. Equity in total is unaffected, since both drawing and expenses reduce equity.

Answer: Debit Drawing \$600, credit Wages Expense \$600; net income rises by \$600 after correction.

PRACTICE

1. Easy What is a transposition? Give an example.

Show answer

Two digits reversed, such as \$731 written as \$713.

2. Easy What is a slide? Give an example.

Show answer

A misplaced decimal, such as \$45.00 written as \$4.50 or \$4,500.

3. Easy Why should a bookkeeper never erase an error in a ledger?

Show answer

Erasing destroys the record and the audit trail and invites suspicion; striking through and initialing keeps the record honest.

4. Medium Debits \$8,250, credits \$8,430. Is a transposition possible? What else could cause it?

Show answer

Difference $\$180 = 9 \times 20$, so yes. Also a \$180 credit posted twice or a \$90 debit posted as a credit.

5. Medium Debits exceed credits by \$640. Name two single errors that could cause this.

Show answer

A \$640 debit posted with no credit; a \$320 credit posted as a debit.

6. Medium Is a difference of \$56 consistent with a transposition? Why?

Show answer

No; 56 is not divisible by 9.

7. Medium Write the correcting entry: a \$480 purchase of supplies for cash was debited to Equipment.

Show answer

Debit Supplies \$480; credit Equipment \$480.

8. **Hard** Write the correcting entry: a \$900 collection from a customer was recorded as Debit Cash \$900, credit Service Revenue \$900.

Show answer

Debit Service Revenue \$900; credit Accounts Receivable \$900.

9. **Hard** A \$2,300 payment on account was recorded as Debit Accounts Payable \$3,200; credit Cash \$3,200. Correct it.

Show answer

Reverse the excess \$900: Debit Cash \$900; credit Accounts Payable \$900.

10. **Hard** Explain why reversing two neighboring digits always makes a difference divisible by 9, using $10a + b$ and $10b + a$.

Show answer

$(10a + b) - (10b + a) = 9a - 9b = 9(a - b)$, a multiple of 9.

11. **Hard** Why did Italian merchants have their ledger pages numbered and stamped by an official?

Show answer

So pages could not be added, removed or rewritten, which made the books trustworthy as evidence.

12. **Challenge** A trial balance is off by \$2,070 (debits higher). You find that a \$1,150 credit to Notes Payable was posted as a debit. Is that the whole error? If not, what remains?

Show answer

That error makes debits too high by \$2,300. Correcting it leaves credits higher by \$230, so another error of \$230 (in the other direction) remains, perhaps a transposition ($230 \div 9$ is not whole, so look for a \$230 one-sided credit or a \$115 debit posted as a credit).

COMMON MISTAKES

- Correcting an error by making a second entry in the same wrong direction.
- Assuming any multiple of 9 must be a transposition; it can be a coincidence.
- Fixing the trial balance total without fixing the ledger account that caused it.

Make it a game • Error Detective Clues. Your parent calls out a trial balance difference, such as 90, 450 or 2,300. In fifteen seconds, name the most likely error: a transposition, a slide, a one-sided posting or a reversed posting, and explain how you can tell. Then write the correcting entry for one example. Keep score over ten clues and aim to beat your last total.

Scripture. “He that is faithful in that which is least is faithful also in much: and he that is unjust in the least is unjust also in much.” (Luke 16:10, KJV)

Finding a \$9 error matters, not because \$9 is much, but because faithfulness in small records is the training for faithfulness in large ones.

UNIT 2

RECORDING TRANSACTIONS

In Unit 1 you learned that every transaction has two sides. In this unit you learn to record them the way bookkeepers have for six centuries: with debits and credits, first in the journal, then in the ledger, and then tested in a trial balance. The stories come from the Hanseatic merchants Holbein painted at the London Steelyard, from George Washington's exact war-expense accounts, from Pacioli's rules for numbered, stamped ledgers, and from a Bristol bookkeeper who claimed he had a better system and was proved wrong.

You will keep a full month of books for a small music-lesson business, journalizing, posting and preparing its trial balance, and then play error detective, finding and correcting planted mistakes with the tests of the trade: half the difference, divisible by 9, and the honest single line through an error.

PREREQUISITES

- The accounting equation and transaction analysis (Lesson 1.2)
- T-accounts and the double-entry idea (Lesson 1.3)
- A chart of accounts (Lesson 1.4)

MASTERY CHECKLIST

- ☐ I can state the debit and credit rules and normal balances for every type of account.
- ☐ I can journalize simple and compound transactions with dates and explanations.
- ☐ I can post to four-column ledger accounts with posting references and running balances.
- ☐ I can prepare a trial balance and explain what it proves and what it cannot prove.
- ☐ I can locate errors from the trial balance difference and write correcting entries.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **AccountingCoach.com**: Free explanations, quizzes and flashcards on debits and credits, journals and the trial balance, written by a CPA. The free sections are enough. Ages 15 and up.
- **GnuCash**: Free double-entry software. Optional: enter the Maple Street Music month and compare GnuCash's trial balance report with yours.
- **LibreOffice Calc**: Free spreadsheet software for the journal and trial balance projects. Google Sheets works just as well.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

2.1	Debits and Credits: The Merchant's Trust	3 sessions of 50 minutes
2.2	The Journal: George Washington's Account Books	3 sessions of 50 minutes
2.3	Posting to the Ledger	3 sessions of 50 minutes
2.4	The Trial Balance	3 sessions of 50 minutes
2.5	Finding and Correcting Errors	3 sessions of 50 minutes

UNIT 2 TEST

Calculators are allowed. Show your work. Every journal entry must have equal debits and credits and an account title for each line. Answer the concept questions in complete sentences. The test is worth 100 points.

1. **6 pts**
Give the normal balance of: Supplies, Unearned Revenue (a liability), Owner's Drawing, Service Revenue, Insurance Expense, Notes Payable.
2. **4 pts**
What do the Latin roots of debit and credit mean, and how did merchants first use the words?

3. **12 pts**

Journalize for Pine Ridge Cleaning: Apr 1, owner invests \$3,000 cash. Apr 3, buys cleaning equipment for \$1,400, \$400 cash and the rest on account. Apr 9, cleans offices for \$950 cash. Apr 14, bills a client \$600. Apr 20, pays \$300 wages. Apr 28, receives \$600 from the client.

4. **8 pts**

Post Problem 3 and give the April 30 balance of each account.

5. **8 pts**

Prepare the trial balance for Problem 4.

6. **5 pts**

Explain the purpose of the posting reference column in both the journal and the ledger.

7. **6 pts**

Accounts Receivable begins at \$1,250 Dr. Postings: debit 840, credit 600, debit 310, credit 1,250. Give the running balances.

8. **5 pts**

A trial balance has debits \$31,480 and credits \$30,940. Give three possible single errors.

9. **6 pts**

Name four errors a trial balance cannot detect.

10. **6 pts**

Write the correcting entry: a \$350 payment for repairs was debited to Equipment.

11. **6 pts**

Write the correcting entry: the owner's \$800 personal withdrawal was recorded as Debit Salaries Expense, credit Cash. Effect on net income before correction?

12. **6 pts**

Write the correcting entry: a \$1,600 credit sale was recorded as Debit Accounts Receivable \$1,060, credit Service Revenue \$1,060.

13. **4 pts**

Prove that reversing the digits of a two-digit number changes it by a multiple of 9.

14. **4 pts**

What did Washington's war-expense account show about public trust, and which parts of a journal entry did it contain?

15. **14 pts**

Essay: Explain why bookkeepers cross out and initial errors instead of erasing them, and why Pacioli wanted ledgers numbered and stamped. Connect your answer to the audit trail in modern software and to Luke 16:10 or Proverbs 11:1.

ANSWER KEY

1. Debit, credit, debit, credit, debit, credit.
2. *Debere*, to owe; *credere*, to trust. They were first used for people: a customer who owed was a debtor (left side); one who was owed was a creditor (right side).
3. Apr 1 Dr Cash 3,000, Cr Capital 3,000. Apr 3 Dr Equipment 1,400, Cr Cash 400, Cr A/P 1,000. Apr 9 Dr Cash 950, Cr Cleaning Revenue 950. Apr 14 Dr A/R 600, Cr Cleaning Revenue 600. Apr 20 Dr Wages Expense 300, Cr Cash 300. Apr 28 Dr Cash 600, Cr A/R 600.
4. Cash $3,000 - 400 + 950 - 300 + 600 = 3,850$ Dr; A/R 0; Equipment 1,400 Dr; A/P 1,000 Cr; Capital 3,000 Cr; Cleaning Revenue 1,550 Cr; Wages Expense 300 Dr.
5. Debits: Cash $3,850 + \text{Equipment } 1,400 + \text{Wages } 300 = 5,550$. Credits: A/P $1,000 + \text{Capital } 3,000 + \text{Revenue } 1,550 = 5,550$.
6. It cross-references the books: the ledger PR shows the journal page, and the journal PR shows the account number, written after posting, so every amount can be traced and no line is skipped or posted twice.
7. 2,090; 1,490; 1,800; 550 Dr.
8. Difference \$540: a \$540 debit with no credit; a \$270 credit posted as a debit; a transposition or slide ($540 \div 9 = 60$), such as 710 written as 170, or 600 written as 60.
9. An omitted transaction; a duplicated transaction; a wrong amount on both sides; posting to the wrong account on the correct side; compensating errors (any four).
10. Debit Repairs Expense \$350; credit Equipment \$350.
11. Debit Drawing \$800; credit Salaries Expense \$800. Net income was understated by \$800.
12. Debit Accounts Receivable \$540; credit Service Revenue \$540.
13. $(10a + b) - (10b + a) = 9(a - b)$.
14. He refused a salary but kept exact, dated, explained accounts of public money and submitted them for settlement. It had dates, explanations and amounts (but not modern debit-credit columns).
15. A strong answer explains that visible corrections keep the full record, protect the bookkeeper from suspicion, and let others verify the books; that numbered, stamped pages prevented secret rewriting and made books acceptable as evidence; that modern software keeps an audit trail of changes for the same

reason; and ties faithfulness in small records or just weights to the honesty of the whole system.

PORTFOLIO PIECE: A MONTH OF REAL BOOKS

Keep a full month of double-entry books for a real activity (a small business, a club or ministry treasury, or your own earnings and spending, with a parent's permission), or for an invented business with at least 20 transactions. File a source document for every entry. Journalize, post to four-column ledger accounts, prepare a trial balance, and have a parent pick five transactions at random and trace them from source document to trial balance. Write a one-page reflection on what you learned and any errors you found and corrected.

LOOK FOR	WHAT IT MEANS
Source documents and journal	At least 20 transactions, each with a filed source document, correct accounts and amounts, and an explanation.
Ledger	All entries posted with posting references and correct running balances.
Trial balance	Properly headed, in chart order, balanced.
Audit trail	Five randomly chosen transactions trace cleanly from source to trial balance; all corrections crossed out with one line and initialed.
Reflection	Explains what the books show and what was learned from any errors.

THE ACCOUNTING CYCLE

A business does not stop, so its accounts must be measured period by period. This unit begins with the change from the venture accounts of single voyages, like Jacob van Neck's fleet of 1599, to the periodic accounts of continuing companies. You will learn the accrual basis and the five kinds of adjusting entries (prepaid expenses, depreciation, unearned revenue, accrued expenses and accrued revenue), starting from Benjamin Franklin's fire-insurance company, which collected seven years of premiums at once.

Then you will organize the end-of-period work on a ten-column worksheet (the paper ancestor of VisiCalc and every modern spreadsheet), close the temporary accounts in a day of reckoning, and work the complete accounting cycle for a small business through two months. The story of Abraham Lincoln's failed store and his "national debt" shows why monthly books matter, and why a good name matters more.

PREREQUISITES

- Debits, credits, the journal, ledger and trial balance (Unit 2)
- Percents and simple interest: $\text{principal} \times \text{rate} \times \text{time}$
- Spreadsheet basics: entering numbers and simple formulas

MASTERY CHECKLIST

- ☐ I can explain the difference between cash and accrual accounting and apply the revenue recognition and matching principles.
- ☐ I can journalize all five kinds of adjusting entries and explain their effect on the statements.
- ☐ I can prepare a ten-column worksheet by hand and in a spreadsheet.
- ☐ I can journalize closing entries and prepare a post-closing trial balance.
- ☐ I can complete the full accounting cycle for a small service business.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- ***Principles of Accounting, Volume 1 (OpenStax), Chapters 4–5***: Free. The chapters on adjusting entries and completing the accounting cycle match this unit, with extra exercises and answers. Ages 15 and up.
- **GnuCash**: Free. Optional for the Lesson 3.5 practice set: enter the September transactions and compare GnuCash's reports with your hand-prepared statements.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

3.1	Accrual versus Cash: From Voyages to Periods	3 sessions of 50 minutes
3.2	Adjusting Entries: Franklin's Fire Insurance	3 sessions of 50 minutes
3.3	The Worksheet: Accountants' Spreadsheets	3 sessions of 50 minutes
3.4	Closing Entries: The Day of Reckoning	3 sessions of 50 minutes
3.5	The Full Cycle: Lincoln's Store and a Practice Set	3 sessions of 50 minutes

UNIT 3 TEST

Calculators are allowed. Show your work for every calculation. Every journal entry must balance. Answer the concept questions and the essay in complete sentences. The test is worth 100 points.

1. **5 pts**

Explain the difference between the cash basis and the accrual basis, and say which GAAP requires.

2. **6 pts**

In April a firm earns \$12,000 (collects \$8,000 in April, the rest in May), collects \$3,000 for March work, incurs \$7,500 of April expenses (pays \$6,000 in April, \$1,500 in May) and pays \$1,000 of March bills. Compute April net income on both bases.

3. (5 pts)

Why did the creation of the Dutch East India Company in 1602 push accounting toward periods instead of ventures?

4. (5 pts)

Supplies \$1,600 on the trial balance; \$450 on hand. Journalize the adjustment.

5. (5 pts)

A two-year insurance policy costing \$4,800 was bought on July 1. Journalize the December 31 adjustment (six months).

6. (5 pts)

Equipment costing \$18,000 with a \$3,000 salvage value has a 5-year life. Journalize one year of straight-line depreciation and give the book value after that year.

7. (5 pts)

A tenant paid \$7,200 on November 1 for six months' rent. Journalize the landlord's December 31 adjustment (two months).

8. (5 pts)

A \$12,000, 7% note was signed October 1. Journalize the December 31 interest accrual.

9. (5 pts)

Services worth \$1,400 were performed on December 29–31 and will be billed in January. Journalize the adjustment.

10. (6 pts)

A company forgot to accrue \$900 of wages and \$600 of revenue earned. Give the effect on net income, total assets, total liabilities and equity.

11. (6 pts)

On a worksheet, the Income Statement columns total Dr \$21,400 and Cr \$26,050. Find net income and state where it is entered.

12. **4 pts**

To which worksheet columns are these extended: Unearned Revenue; Drawing; Depreciation Expense; Accumulated Depreciation?

13. **8 pts**

Journalize the closing entries: Service Revenue \$19,000; Rent Expense \$4,800; Wages Expense \$8,200; Utilities Expense \$700; Drawing \$3,500.

14. **4 pts**

If beginning capital in Problem 13 was \$22,000, what is ending capital?

15. **5 pts**

Which accounts appear on the post-closing trial balance, and why?

16. **6 pts**

List the nine steps of the accounting cycle in order.

17. **15 pts**

Essay: Using the Berry and Lincoln store as your example, explain how a full monthly accounting cycle could have warned the partners of trouble. Mention at least three specific accounts or adjustments, and close with what Lincoln's repayment of his "national debt" teaches about character in business.

ANSWER KEY

1. Cash basis records revenue and expenses when cash moves; accrual records revenue when earned and expenses when incurred. GAAP requires accrual.
2. Accrual $12,000 - 7,500 = \$4,500$. Cash $(8,000 + 3,000) - (6,000 + 1,000) = \$4,000$.
3. The VOC was a continuing company with overlapping voyages and permanent assets; there was no single end at which to measure profit, so profit had to be measured by period.
4. Debit Supplies Expense \$1,150; credit Supplies \$1,150.
5. $4,800 \div 24 \times 6 = \$1,200$. Debit Insurance Expense \$1,200; credit Prepaid Insurance \$1,200.
6. $(18,000 - 3,000) \div 5 = \$3,000$. Debit Depreciation Expense \$3,000; credit Accumulated Depreciation \$3,000. Book value \$15,000.
7. Debit Unearned Rent Revenue \$2,400; credit Rent Revenue \$2,400.
8. $12,000 \times 0.07 \times 3/12 = \$210$. Debit Interest Expense \$210; credit Interest Payable \$210.
9. Debit Accounts Receivable \$1,400; credit Service Revenue \$1,400.
10. Net income overstated by 900 and understated by 600: overstated by \$300 net. Assets understated by \$600. Liabilities understated by \$900. Equity overstated by \$300.
11. \$4,650 net income; entered in the Income Statement debit column and the Balance Sheet credit column.
12. BS Cr; BS Dr; IS Dr; BS Cr.
13. (1) Dr Service Revenue 19,000, Cr Income Summary 19,000. (2) Dr Income Summary 13,700; Cr Rent 4,800, Wages 8,200, Utilities 700. (3) Dr Income Summary 5,300, Cr Capital 5,300. (4) Dr Capital 3,500, Cr Drawing 3,500.
14. $22,000 + 5,300 - 3,500 = \$23,800$.
15. Only permanent accounts (assets, contra-assets, liabilities, capital), because all temporary accounts have been closed to zero.
16. Analyze; journalize; post; trial balance; adjusting entries; adjusted trial balance or worksheet; financial statements; closing entries; post-closing trial balance.
17. A strong answer names accounts such as Notes Payable (heavy debt bought the stock), Accounts Receivable (slow credit sales), Interest Expense or Interest Payable accruals, Inventory and Owner's Equity (very little), explains that

monthly income statements and balance sheets would have shown low profit and rising debt, and reflects on Lincoln keeping his word and repaying in full.

PORTFOLIO PIECE: TWO MONTHS OF COMPLETE BOOKS

Keep two consecutive months of complete books for a real or invented service business, with at least 15 transactions each month. For each month, journalize, post, prepare a trial balance, adjust (at least four kinds of adjustment), complete a worksheet in a spreadsheet with check cells, prepare the three statements, close, and prepare a post-closing trial balance. Carry the first month's balances into the second. Write a one-page letter to the owner comparing the two months.

LOOK FOR	WHAT IT MEANS
Recording	All transactions journalized and posted correctly with posting references.
Adjustments	At least four kinds of adjustment each month, correctly computed and explained.
Worksheet and statements	Spreadsheet worksheet with working check cells; statements properly headed and in agreement with the worksheet.
Closing	Closing entries correct; post-closing trial balances balance; balances carried forward correctly.
Letter	Clearly compares the two months using the statements and gives one specific recommendation.

3.1 ACCRUAL VERSUS CASH: FROM VOYAGES TO PERIODS

OBJECTIVES

- Explain why continuing businesses measure profit by periods rather than by ventures.
- Distinguish the cash basis from the accrual basis, and apply the revenue recognition and matching (expense recognition) principles.
- Compute net income for the same period on both bases and explain the difference.

Warm-up. In September you mow a neighbor's lawn four times at \$25, and she pays you the \$100 in October. In which month did you earn the money? In which month did you receive it? Write your answer, then decide which month's "profit" should count it.

WATCH

Accrual Accounting: How it Works & Why it's #1!

Accounting Stuff · 7:06

<https://www.youtube.com/watch?v=C8UuX75ZarU>

WHEN TO WATCH

After the big idea and before the worked examples.

BACKUP VIDEO

Cash vs Accrual Accounting

Edspira · 8:47

https://www.youtube.com/watch?v=Of2tFsfKm_8

Before the practice set.

KEY TERMS

cash basis

Revenue is recorded when cash is received and expenses when cash is paid, regardless of when they were earned or incurred.

accrual basis

Revenue is recorded when it is earned and expenses when they are incurred to earn it, regardless of when cash moves. Required by GAAP.

revenue recognition principle

Record revenue in the period when the goods or services are delivered to the customer.

matching (expense recognition) principle

Record expenses in the same period as the revenue they helped earn.

accounting period

The span of time covered by financial statements: a month, quarter or year. A fiscal year is any twelve-month accounting year.

CORE IDEAS

The story. In 1598 a group of Amsterdam merchants sent eight ships under Jacob van Neck to the East Indies for pepper, cloves and nutmeg. Four ships came home on July 19, 1599, to cheering crowds and church bells, and the voyage paid its investors a large profit. The early Dutch companies, like the Italian merchants before them, kept *venture* accounts: each voyage was a separate enterprise, its books closed when the ships were back and the goods sold, and the profit divided. There was no question of “periods”: a voyage’s profit was known only at its end, sometimes three years later.

How they figured it out. In 1602 the competing companies were merged into the Dutch East India Company (VOC), chartered for 21 years, with ships always at sea, warehouses always full and debts always outstanding. A business that never stops cannot wait for the end to learn whether it is making money. Over the following two centuries, as companies became permanent, accountants divided their lives into equal periods and asked a harder question: *what did we earn and what did it cost during this year?* Answering it means counting revenue when it is earned, even if the customer has not yet paid, and counting expenses in the period they help earn revenue, even if the bill comes later. That is the **accrual basis**.

The big idea. On the **cash basis**, revenue is recorded when cash comes in and expenses when cash goes out. It is simple, but it can badly distort profit: a firm that does a large job in December and is paid in January looks poor in December and rich in January. On the **accrual basis**, two principles govern timing. The **revenue recognition principle**: record revenue when the service is performed or the goods delivered. The **matching principle**: record expenses in the same period as the

revenue they helped produce. Accrual accounting gives a truer picture of performance for each period, which is why GAAP requires it.

In business today. Many very small businesses and most households use the cash basis because it is simple and it matches the bank account. Every company that reports under GAAP uses accrual accounting, and so do most lenders' reporting requirements. Accrual accounting creates new accounts that cash accounting never needs: **accounts receivable** and **accounts payable**, **prepaid expenses** (paid before used), **unearned revenue** (received before earned), and **accrued expenses** and revenues (used or earned before paid). Adjusting entries (Lesson 3.2) keep them right.

Think it through. Accrual accounting requires judgment: when exactly is a service “performed”? That judgment can be used honestly or bent. Several of the frauds in this course began with revenue recognized before it was earned.

PICTURE STUDY



The Return to Amsterdam of the Second Expedition to the East Indies, Hendrick Cornelisz Vroom, 1599 ·
Oil on canvas · Rijksmuseum, Amsterdam
Image: [Wikimedia Commons](#), public domain

Vroom painted the homecoming of Jacob van Neck's ships on July 19, 1599, the year it happened. The voyage's investors had waited more than a year to learn whether they had gained or lost.

Look closely

- Count the large ships. How many came home?
- Find the small boats rowing out. What are the people doing?
- Look for the city skyline. Can you find church towers?
- Find the flags. What do they tell you about who owned the ships?

Talk about it

1. When could the investors in this voyage know their profit?
2. Why would a company with ships always at sea need a different way to measure profit?
3. Who besides the investors (workers, sailors' families, the city) depended on this voyage's success?

PROJECT

Cash Basis versus Accrual Basis for a Real Month

You will take one month of real or realistic activity and measure its income both ways.

You will need

- Ledger notebook or spreadsheet
- A month of records from a small business, a family, or the sample in the steps

Steps

1. Choose a month of activity. If you have none, use this sample for a photography business in May: shoots completed \$5,200 (paid in May \$3,400, in June \$1,800); deposits received in May for June weddings \$1,500; April shoots collected in May \$900; May camera insurance (paid in January for the year) \$60 a month; May assistant wages \$1,100, of which \$800 paid in May and \$300 in June; May editing software, paid in May, \$40.
2. Make two columns: Cash basis and Accrual basis.
3. List every item and decide, for each basis, whether it belongs in May revenue, May expense or neither.
4. Total each column and compute net income both ways.
5. List the accrual accounts the business needs at May 31 (receivables, unearned revenue, prepaid insurance, wages payable) and their balances.
6. Explain the difference between the two net incomes item by item.
7. Write a paragraph: which number better tells the owner how May went, and why might a lender want the accrual figure?

Tips

- For each item ask two questions: when was it earned or used, and when did cash move?
- Deposits for future work are not revenue yet on the accrual basis.

Check your work

- ☐ For the sample: cash-basis revenue $3,400 + 1,500 + 900 = \$5,800$ and expenses $800 + 40 = \$840$, net $\$4,960$; accrual revenue $\$5,200$ and expenses $60 + 1,100 + 40 = \$1,200$, net $\$4,000$.
- ☐ I listed the accrual accounts at month-end with their balances.
- ☐ I can explain each difference.

LEDGER NOTEBOOK

1. Draw a timeline for one sale: work done (revenue earned), bill sent, cash received. Mark where each basis records it.
2. Make a two-column chart: cash basis versus accrual basis, with three advantages of each.
3. Write the revenue recognition and matching principles in your own words.

KEY FORMULAS

Accrual net income = Revenue earned – Expenses incurred

Cash-basis net income = Cash received from customers – Cash paid for expenses

From history. The VOC's charter of 1602 promised investors an accounting after ten years. When the time came, the directors did not produce full accounts, and some shareholders complained in print. Demands for regular, periodic reports to investors are almost as old as the joint-stock company itself.

WORKED EXAMPLES

Example 1. In March, a painter: completes \$9,000 of jobs, of which customers pay \$6,500 in March and \$2,500 in April; collects \$1,200 in March for a February job; pays \$3,000 in March for March paint and wages; receives a \$700 bill for March supplies that she pays in April; and pays \$1,800 on March 1 for a six-month insurance policy (March–August). Find March net income on the cash basis and on the accrual basis.

Show solution

1. Cash basis, revenue: cash received in March = $6,500 + 1,200 = \$7,700$.
2. Cash basis, expenses: cash paid in March = $3,000 + 1,800 = \$4,800$.
3. Cash-basis net income = $7,700 - 4,800 = \$2,900$.
4. Accrual basis, revenue: earned in March = \$9,000 (the February job belongs to February).
5. Accrual basis, expenses: $3,000 + 700$ (March supplies, though unpaid) $+ 1,800 \div 6 = 300$ (one month of insurance) = \$4,000.
6. Accrual net income = $9,000 - 4,000 = \$5,000$.

Answer: Cash basis \$2,900; accrual basis \$5,000. Accrual better shows what March actually produced.

Example 2. A magazine publisher receives \$36,000 on December 1 for 12-month subscriptions starting in December. How much revenue belongs to December, and what is the rest?

Show solution

1. Revenue is earned as each month's issue is delivered: $36,000 \div 12 = \$3,000$ a month.
2. December revenue = \$3,000.
3. The other \$33,000 is **unearned revenue**, a liability: the publisher owes 11 more issues.

Answer: December revenue \$3,000; unearned revenue (liability) \$33,000.

Example 3. The first Dutch voyage of 1595–97 returned with little profit; Van Neck’s voyage of 1598–99 returned a large one. Explain why venture accounting worked for such voyages and why it fails for the VOC.

Show solution

1. A single voyage has a clear start (fitting out) and end (selling the cargo). All costs and revenues can be matched to it and the books closed when it ends.
2. The VOC ran many overlapping voyages and permanent trading posts and warehouses. There was never an “end,” so profit had to be measured period by period, with revenues and expenses assigned to the year they belong to.

Answer: Venture accounting suits one-time enterprises; continuing firms need periodic, accrual accounting.

PRACTICE

1. Easy State the revenue recognition principle.

Show answer

Record revenue when the goods or services are delivered (earned), not necessarily when cash is received.

2. Easy State the matching principle.

Show answer

Record expenses in the same period as the revenues they helped earn.

3. Easy Which basis does GAAP require?

Show answer

The accrual basis.

4. Medium A consultant bills a client \$4,000 for December work; the client pays in January. Record December’s entry on the accrual basis.

Show answer

Debit Accounts Receivable \$4,000; credit Consulting Revenue \$4,000 (in December).

5. **Medium** On the cash basis, in which month would the \$4,000 in Problem 4 be revenue?

Show answer

January, when the cash is received.

6. **Medium** A business pays \$2,400 on January 1 for two years of rent. How much is January's rent expense on the accrual basis? On the cash basis?

Show answer

Accrual \$100; cash basis \$2,400.

7. **Medium** Give an example of (a) a prepaid expense, (b) unearned revenue, (c) an accrued expense.

Show answer

Sample: (a) insurance paid in advance; (b) customer deposits or subscriptions received in advance; (c) wages earned by workers but not yet paid.

8. **Hard** In June a shop earns \$15,000 (customers paid \$11,000 in June and owe \$4,000), collects \$2,500 for May sales, uses \$6,200 of expenses (it paid \$5,000 of them in June and owes \$1,200), and pays \$900 for May bills. Compute June income on both bases.

Show answer

Accrual: $15,000 - 6,200 = \$8,800$. Cash: $(11,000 + 2,500) - (5,000 + 900) = \$7,600$.

9. **Hard** Why did the merger of 1602 make periodic accounting necessary?

Show answer

The VOC was a continuing company with overlapping voyages and permanent assets, so its profit had to be measured by periods rather than at the end of single ventures.

10. **Hard** Why might a business owner prefer the cash basis for her own small records, and what would she lose?

Show answer

It is simple and matches the bank account; she loses an accurate picture of each period's performance and of what she is owed and owes.

11. **Challenge** A company ships \$500,000 of goods on December 30 that the customer has not ordered, and records them as December sales. Which principle is abused, and who is misled?

Show answer

Revenue recognition: no sale was earned, since the customer did not order or accept the goods. Investors, lenders and managers are misled about December's results.

COMMON MISTAKES

- Counting customer deposits as revenue when received.
- Expensing a long insurance policy all at once.
- Thinking accrual accounting ignores cash. It records cash too; it just times revenue and expenses by when they are earned and incurred.

Make it a game • Cash or Accrual Duel. Your parent reads a short event, such as a customer who orders in March but pays in April, or supplies bought in January and used in February. You say in which month the revenue or expense belongs under cash basis and under accrual basis, citing the matching or revenue recognition principle. Two points for each pair correct. Play ten events.

Scripture. “To every thing there is a season, and a time to every purpose under the heaven:” (Ecclesiastes 3:1, KJV)

Accrual accounting is about putting each revenue and expense in its proper time, the period in which it truly belongs.

3.2 ADJUSTING ENTRIES: FRANKLIN'S FIRE INSURANCE

OBJECTIVES

- Identify the five kinds of adjusting entries: prepaid expenses, depreciation, unearned revenue, accrued expenses and accrued revenue.
- Journalize and post adjusting entries at the end of a period.
- Explain how each adjustment affects the income statement and the balance sheet, and what happens if it is forgotten.

Warm-up. You buy a 12-pack of printer paper reams for \$60 in January and use 3 reams by the end of the month. How much paper did you “spend” in January: \$60 or \$15? What do you still own?

WATCH

Prepayments and Accruals | Adjusting Entries

Accounting Stuff · 9:57

<https://www.youtube.com/watch?v=H0N7tvXuJlU>

WHEN TO WATCH

After the big idea, before the worked examples.

BACKUP VIDEO

FA13 - Adjusting Journal Entries Explained

Tony Bell · 4:34

<https://www.youtube.com/watch?v=ILa6NhOnHck>

Before the practice set, as a quick summary of all five types.

KEY TERMS

adjusting entry

An end-of-period entry that updates accounts so revenues and expenses fall in the right period. Each one affects one income-statement account and one balance-sheet account, and never Cash.

prepaid expense

An asset for a cost paid in advance (supplies, insurance, rent). Adjusting moves the used-up part to expense.

depreciation

Allocating the cost of a long-lived asset to expense over its useful life.

Recorded with a credit to the contra-asset Accumulated Depreciation.

unearned revenue

A liability for cash received before the service is performed. Adjusting moves the earned part to revenue.

accrued expense / accrued revenue

An expense incurred but not yet paid or recorded (wages, interest), or revenue earned but not yet billed or recorded.

book value

An asset's cost minus its accumulated depreciation.

CORE IDEAS

The story. Fire was the great fear of colonial cities built of wood. In 1752 Benjamin Franklin and other citizens of Philadelphia founded the Philadelphia Contributionship for the Insurance of Houses from Loss by Fire, the oldest property insurance company in the United States, still in business today. Homeowners paid a deposit for a policy covering seven years, and the company placed a cast-iron fire mark of four clasped hands on each insured house. From the company's side, money received for seven years of protection was not seven years of earnings on the first day; it was a promise to be kept over time.

How they figured it out. Every business has costs and revenues that cross the end of a period. Insurance paid for a year, supplies bought in bulk, a truck that will last five years, customers who pay ahead, workers who are owed for the last few days of the month, interest that grows each day on a loan. During the month, bookkeepers record transactions as cash moves. At the end, before preparing statements, they make **adjusting entries** to bring each account up to date, so that revenues and expenses land in the period where they belong.

The big idea. There are five kinds of adjustment. **Prepaid expenses:** debit the expense, credit the asset for the part used (Supplies Expense / Supplies; Insurance Expense / Prepaid Insurance). **Depreciation:** debit Depreciation Expense, credit Accumulated Depreciation, a contra-asset that keeps the original cost visible. **Unearned revenue:** debit Unearned Revenue, credit Revenue for the part earned. **Accrued expenses:** debit the expense, credit a payable (Wages Payable, Interest Payable). **Accrued revenue:** debit Accounts Receivable, credit Revenue. Every

adjusting entry touches one balance-sheet account and one income-statement account, and none touches Cash.

In business today. Insurance companies still record premiums as unearned revenue and earn them month by month; their customers record prepaid insurance and expense it month by month: the same policy, seen from two sides. Software can automate repeating adjustments (monthly depreciation, insurance), but someone must still count supplies, check unpaid wages and estimate what has been earned. A forgotten adjustment misstates both statements: forget to accrue \$450 of wages and expenses are \$450 too low, net income \$450 too high, and liabilities \$450 too low.

Try it. The worked examples use Summit Lawn Care, a new business, at the end of its first month. You will carry these numbers into the worksheet (Lesson 3.3) and the closing entries (Lesson 3.4).

PICTURE STUDY



Benjamin Franklin, Joseph-Siffred Duplessis, about 1785 · Oil on canvas · National Portrait Gallery, Smithsonian Institution, Washington
Image: [Wikimedia Commons](#), public domain

Duplessis painted Franklin in Paris, where he served as the American minister during the War of Independence. A printer, writer, scientist and statesman, Franklin also helped found Philadelphia's first fire company (1736) and its first fire insurance company (1752).

Look closely

- Look at Franklin's clothes. Are they grand or plain?
- Look at his face and eyes. What kind of man does the painter show?
- Notice the plain, dark background.
- What is missing that you might expect in a portrait of a famous man?

Talk about it

1. Franklin's insurance company collected seven years of premiums at once. Why could it not count all of it as earned on the first day?
2. How does an insurance policy look different on the books of the company and of the homeowner?
3. Franklin wrote that "an ounce of prevention is worth a pound of cure." How are adjusting entries a kind of prevention?

PROJECT

Adjust a Real Month's Books

You will find the adjustments a small business needs at month-end and journalize them, using your own business records or the Summit case.

You will need

- Your Maple Street Music books from Unit 2 (or the Summit trial balance)
- Ledger notebook or spreadsheet

Steps

1. Return to Maple Street Music Lessons' June 30 trial balance (Lesson 2.4).
2. Use this adjustment data: (a) a count shows \$190 of supplies on hand; (b) the piano will be depreciated at \$50 a month; (c) Clara owes her accompanist \$160 for June lessons, to be paid in July; (d) one month of interest on the \$2,600 note at 6% a year, computed on the original \$2,600 for simplicity; (e) lessons given June 29–30 but not yet billed, \$90.
3. Decide the type of each adjustment and the two accounts it affects. Add any new accounts you need (Accumulated Depreciation, Wages Payable, Interest Payable, Supplies Expense, Depreciation Expense, Wages Expense, Interest Expense).
4. Journalize the five adjustments, with explanations, on journal page J2.
5. Post them to your ledger, adding the new accounts.
6. Prepare the adjusted trial balance at June 30. Its totals should be \$9,783.
7. Compute net income before and after adjustments and explain the difference.
8. Write a short note to Clara explaining what would have been wrong if she had skipped the adjustments.

Tips

- Each adjusting entry has one income-statement account and one balance-sheet account.
- Interest: $\text{principal} \times \text{annual rate} \times \text{fraction of a year}$.

Check your work

- ☐ Adjustments: Supplies Expense \$150; Depreciation \$50; Wages \$160; Interest \$13; accrued revenue \$90; total \$463.
- ☐ Adjusted trial balance totals \$9,783 each.
- ☐ Net income before adjustments \$735; after adjustments $2,160 - 1,708 = \$452$.

LEDGER NOTEBOOK

1. Make a five-row table: adjustment type, the account debited, the account credited, and an example from Summit.
2. Draw the insurance policy from both sides: the homeowner's Prepaid Insurance and the company's Unearned Premiums, month by month.
3. Write what happens to each statement if an accrued expense is forgotten.

KEY FORMULAS

Supplies used = Beginning supplies + Purchases – Supplies on hand

Straight-line depreciation per period = $\frac{\text{Cost} - \text{Salvage value}}{\text{Number of periods of useful life}}$

Simple interest = $P \times r \times t$

From history. The Contributionship's fire mark of four clasped hands, called the Hand-in-Hand, was copied from a London insurance office of 1696. Insured houses wore the mark so that fire companies and the public could see that the house was covered.

WORKED EXAMPLES

Example 1. Summit Lawn Care (owner Eli Brooks) opened July 1. Its unadjusted trial balance at July 31: Cash \$6,200; Accounts Receivable \$1,500; Supplies \$900; Prepaid Insurance \$1,200 (a 12-month policy bought July 1); Equipment \$12,000; Accounts Payable \$800; Unearned Revenue \$1,800 (a customer paid on July 1 for six months of service at \$300 a month); Notes Payable \$6,000 (signed July 1 at 6% a year); Eli Brooks, Capital \$10,000; Eli Brooks, Drawing \$1,000; Service Revenue \$7,400; Wages Expense \$2,600; Fuel Expense \$400; Rent Expense \$200. Debits and credits each total \$26,000. Adjustment data at July 31: (a) supplies on hand, \$350; (b) one month of insurance has expired; (c) equipment depreciation, \$200 a month; (d) one month of the prepaid service has been performed; (e) wages earned but unpaid, \$450; (f) one month of interest on the note; (g) work done but not yet billed, \$250. Journalize adjustments (a) through (d).

Show solution

1. (a) Supplies used = $900 - 350 = \$550$. Debit Supplies Expense \$550; credit Supplies \$550.
2. (b) Insurance expired = $1,200 \div 12 = \$100$. Debit Insurance Expense \$100; credit Prepaid Insurance \$100.
3. (c) Debit Depreciation Expense \$200; credit Accumulated Depreciation—Equipment \$200.
4. (d) One month earned: $1,800 \div 6 = \$300$. Debit Unearned Revenue \$300; credit Service Revenue \$300.

Answer: Supplies Expense \$550; Insurance Expense \$100; Depreciation Expense \$200; \$300 of Unearned Revenue moved to Service Revenue.

Example 2. Journalize Summit's adjustments (e) through (g).

Show solution

1. (e) Debit Wages Expense \$450; credit Wages Payable \$450.
 2. (f) Interest = $6,000 \times 0.06 \times \frac{1}{12} = 30$. Debit Interest Expense \$30; credit Interest Payable \$30.
 3. (g) Debit Accounts Receivable \$250; credit Service Revenue \$250.
 4. Total of all seven adjustments: $550 + 100 + 200 + 300 + 450 + 30 + 250 = \$1,880$ debit and \$1,880 credit.
-

Answer: Wages Expense +\$450, Interest Expense +\$30, Service Revenue +\$250; adjustments total \$1,880.

Example 3. Prepare Summit's adjusted trial balance at July 31.

Show solution

1. Debits: Cash 6,200; Accounts Receivable 1,750; Supplies 350; Prepaid Insurance 1,100; Equipment 12,000; Drawing 1,000; Wages Expense 3,050; Fuel Expense 400; Rent Expense 200; Supplies Expense 550; Insurance Expense 100; Depreciation Expense 200; Interest Expense 30.
 2. Debit total: \$26,930.
 3. Credits: Accumulated Depreciation 200; Accounts Payable 800; Wages Payable 450; Interest Payable 30; Unearned Revenue 1,500; Notes Payable 6,000; Capital 10,000; Service Revenue 7,950.
 4. Credit total: \$26,930.
 5. The totals grew from \$26,000 by \$930: the adjustments that added new balances (Accumulated Depreciation 200, Wages Payable 450, Interest Payable 30, accrued revenue 250) rather than shifting old ones.
-

Answer: Adjusted trial balance totals $\$26,930 = \$26,930$. Revenue \$7,950 – expenses \$4,530 = net income \$3,420.

Example 4. Suppose Summit forgot adjustment (e), the \$450 of accrued wages. What would be wrong on the statements?

Show solution

1. Wages Expense would be \$450 too low, so net income would be \$450 too high (\$3,870 instead of \$3,420).
2. Wages Payable would be missing, so liabilities would be \$450 too low.
3. Ending equity would be \$450 too high, so the balance sheet would still balance, but both sides would be wrong.

Answer: Expenses and liabilities understated by \$450; net income and equity overstated by \$450.

PRACTICE

1. **Easy** Why does no adjusting entry involve Cash?

Show answer

Adjustments update accounts for revenue earned or expenses incurred without a new cash transaction; cash was recorded when it moved.

2. **Easy** Name the five types of adjusting entries.

Show answer

Prepaid expenses, depreciation, unearned revenue, accrued expenses, accrued revenue.

3. **Easy** What kind of account is Accumulated Depreciation, and what is its normal balance?

Show answer

A contra-asset with a normal credit balance.

4. **Medium** Supplies had a balance of \$1,240; a count shows \$380 on hand. Journalize the adjustment.

Show answer

Debit Supplies Expense \$860; credit Supplies \$860.

5. **Medium** A \$3,600 one-year insurance policy was bought on April 1. Journalize the adjustment at April 30 and give the remaining prepaid balance.

Show answer

Debit Insurance Expense \$300; credit Prepaid Insurance \$300. Remaining \$3,300.

6. **Medium** A van costs \$30,000, has a \$6,000 salvage value and a 4-year life. Journalize one month of straight-line depreciation.

Show answer

$(30,000 - 6,000) \div 48 = \$500$. Debit Depreciation Expense \$500; credit Accumulated Depreciation \$500.

7. **Medium** A client paid \$4,800 on October 1 for 8 months of service. Journalize the October 31 adjustment.

Show answer

Debit Unearned Revenue \$600; credit Service Revenue \$600.

8. **Medium** Employees earn \$250 a day, paid every Friday for a five-day week. The month ends on a Wednesday (3 days worked since payday). Journalize the accrual.

Show answer

Debit Wages Expense \$750; credit Wages Payable \$750.

9. **Hard** A \$9,000, 8% note was signed November 1. Journalize the December 31 interest accrual (two months).

Show answer

$9,000 \times 0.08 \times 2/12 = \$120$. Debit Interest Expense \$120; credit Interest Payable \$120.

10. **Hard** The Philadelphia Contributionship receives \$70 on January 1 for a 7-year policy. Journalize the receipt and the first year's adjustment from the company's side.

Show answer

Jan 1: Debit Cash \$70; credit Unearned Premiums \$70. Dec 31: Debit Unearned Premiums \$10; credit Premium Revenue \$10.

11. **Hard** A company forgot to record \$1,500 of depreciation and \$800 of revenue earned but not billed. Effect on net income, assets, liabilities and equity?

Show answer

Net income: -1,500 understatement of expense makes it too high by 1,500; missing revenue makes it too low by 800; net, too high by \$700. Assets: A/R too low by 800 and accumulated depreciation too low by 1,500, so assets too high by \$700. Liabilities unaffected. Equity too high by \$700.

12. **Challenge** After adjustments, Summit's Equipment has a book value of \$11,800. Explain why the accountant credits Accumulated Depreciation rather than Equipment directly.

Show answer

The contra account keeps the original cost (\$12,000) visible on the books while showing total depreciation so far (\$200); readers see both how much was paid and how much has been used.

COMMON MISTAKES

- Crediting Equipment instead of Accumulated Depreciation.
- Recording the amount on hand as the expense, instead of the amount used.
- Including Cash in an adjusting entry.

Make it a game • Name That Adjustment. Your parent describes a situation: twelve months of insurance paid in advance, a machine aging, a student paying for lessons not yet taught, wages earned but unpaid, interest earned but uncollected. You name the adjustment type and journalize it in sixty seconds, with amounts you choose. Franklin would have approved of the insurance. Aim for five correct entries in a row.

3.3 THE WORKSHEET: ACCOUNTANTS' SPREADSHEETS

OBJECTIVES

- Prepare a ten-column worksheet from the trial balance through the adjusted trial balance to the income statement and balance sheet columns.
- Use the worksheet to compute net income and check the work before statements are prepared.
- Build the worksheet in a spreadsheet with formulas.

Warm-up. Look at a large table of numbers (a sports standings page or a nutrition label). How is it organized so you can read across a row and down a column? Sketch the layout.

WATCH

The 10 Columns Accounting worksheet. Financial Accounting

Farhat Lectures. The # 1 CPA & Accounting Courses · 13:38

<https://www.youtube.com/watch?v=YOF7U0UAFwo>

WHEN TO WATCH

After the big idea; follow along and fill in your own worksheet as the presenter fills in his.

Note: The channel sells exam-review courses; stop when the worksheet is finished.

BACKUP VIDEO

FA16 - Adjusted Trial Balance

Tony Bell · 9:24

<https://www.youtube.com/watch?v=TKpabpcjk14>

Before the project, to review the adjusted trial balance.

KEY TERMS

worksheet

A large columnar working paper, not a formal statement, used to organize the trial balance, adjustments and figures for the statements in one place.

spreadsheet

Originally a large sheet of paper ruled in columns, spread across two facing pages of an accountant's pad; now a computer program that works the same way with formulas.

extending

Carrying each adjusted balance across to the income statement or balance sheet columns of the worksheet.

CORE IDEAS

The story. For a century, accountants did their end-of-period work on wide paper pads called columnar pads or spread sheets, with a dozen or more columns across two facing pages. In 1978 a Harvard Business School student, Dan Bricklin, watched a professor work a financial model on a blackboard, erasing and recomputing a whole row every time one number changed. Bricklin imagined an “electronic blackboard” that would recompute itself. With his friend Bob Frankston he wrote VisiCalc, released in 1979 for the Apple II. Accountants and small-business owners bought Apple computers just to run it, and VisiCalc became the first program for which people bought personal computers just to use it.

How they figured it out. The paper worksheet had already solved the organization problem: put every account on one row and every step of the work in a pair of columns, so the bookkeeper can see the whole process at once and catch errors before writing formal statements. The electronic spreadsheet solved the arithmetic: change an adjustment and every total updates. The layout Bricklin automated is the same one you will draw by hand in this lesson.

The big idea. The ten-column worksheet has five pairs of debit-credit columns. (1) **Trial Balance:** the unadjusted ledger balances. (2) **Adjustments:** each adjusting entry, keyed with a letter. (3) **Adjusted Trial Balance:** each row combined across. (4) **Income Statement:** revenue and expense balances extended here. (5) **Balance Sheet:** asset, contra-asset, liability, capital and drawing balances extended here. Total the income statement columns: the difference is net income (credits larger) or net loss.

The balance sheet columns differ by the same amount. Adding net income to the balance-sheet credit column and the income-statement debit column makes both pairs balance, a powerful check.

In business today. Software produces adjusted trial balances directly, so few businesses draw a paper worksheet. But accountants live in spreadsheets: month-end closing workbooks, reconciliations, budgets and auditors' working papers are worksheets in exactly this sense. Learning the worksheet by hand teaches you to build and check a spreadsheet, and to know whether a computer's answer makes sense.

Think it through. A spreadsheet makes arithmetic easy but makes errors easy too: one wrong formula copied down a column can corrupt a whole report. Build check cells (debits minus credits should be zero) into every sheet you make.

PICTURE STUDY



Charles Meiner, Bookkeeper for the Rodman Company, Rodman Bay, Alaska, Florence Bent (snapshot), about 1900 · Photograph · University of Washington Libraries, Special Collections
Image: [Wikimedia Commons](#), public domain

This snapshot, taken by a visitor around 1900, shows the bookkeeper of a small company at Rodman Bay in Alaska, outside the building where he worked. Far from any city, he kept the company's books by hand: journals, ledgers and the end-of-month working papers.

Look closely

- Look at the bookkeeper's clothes. Are they office clothes or work clothes?
- Find the company building behind him. What might it hold?
- Look at the ground and the trees. How remote is this place?
- What do his outstretched arms suggest about his mood?

Talk about it

1. Without a computer or adding machine, how would this bookkeeper check his month-end work?
2. Why would a remote company especially need a careful bookkeeper?
3. What would change in his work if he had a spreadsheet program?

PROJECT

Build a Ten-Column Worksheet by Hand and in a Spreadsheet

You will prepare a full worksheet for Maple Street Music Lessons on paper, then build it as a live spreadsheet with check cells.

You will need

- Ten-column worksheet paper (or rule your own on a two-page spread)
- Your June 30 trial balance and adjustments
- Spreadsheet software

Steps

1. Head the worksheet: Maple Street Music Lessons / Worksheet / For the Month Ended June 30, 20—.
2. List every account in chart order, including the new ones from your adjustments, and enter the trial balance amounts.
3. Enter the five adjustments, each labeled (a)–(e) on both sides, and total the Adjustments columns (\$463 each).
4. Combine across to the Adjusted Trial Balance and total it (\$9,783 each).
5. Extend each balance to the Income Statement or Balance Sheet columns.
6. Total the Income Statement and Balance Sheet columns, compute net income (\$452), and enter it to balance both pairs.
7. Build the same worksheet in a spreadsheet. Use formulas for every adjusted and extended amount and for every total.
8. Add three check cells: trial-balance difference, adjusted-trial-balance difference, and (IS net income – BS difference). All should be zero.
9. Change adjustment (a) to \$250 of supplies on hand and watch net income change. Explain the new figure, then change it back.

Tips

- Use a ruler and pencil on paper; small misalignments cause big errors.
- In the spreadsheet, put each adjustment's letter in a separate column so you can trace it.

Check your work

- ☐ Every pair of columns balances on paper and in the spreadsheet.
- ☐ Net income is \$452 and appears in the Income Statement debit and Balance Sheet credit columns.
- ☐ My spreadsheet's three check cells all show zero.

LEDGER NOTEBOOK

1. Sketch the ten-column headings and draw arrows showing how an account moves across.
2. Write the rule for extending: which accounts go to the Income Statement columns.
3. Note one advantage and one danger of electronic spreadsheets.

From history. Bricklin and Frankston did not patent VisiCalc; software patents were rare then. Lotus 1-2-3 (1983) and later Microsoft Excel built on the idea. Today's free spreadsheets, Google Sheets and LibreOffice Calc, still use the row-and-column grid of the accountant's paper pad.

WORKED EXAMPLES

Example 1. Complete the worksheet for Summit Lawn Care at July 31 (trial balance and adjustments from Lessons 3.2). Show the totals of each pair of columns.

Show solution

1. Trial Balance columns: \$26,000 Dr and \$26,000 Cr.
2. Adjustments columns: (a) 550, (b) 100, (c) 200, (d) 300, (e) 450, (f) 30, (g) 250.
Total \$1,880 Dr and \$1,880 Cr.
3. Adjusted Trial Balance columns: \$26,930 Dr and \$26,930 Cr.
4. Income Statement columns: debits (expenses) $3,050 + 400 + 200 + 550 + 100 + 200 + 30 = \$4,530$; credits (Service Revenue) \$7,950.
5. Balance Sheet columns: debits Cash 6,200 + A/R 1,750 + Supplies 350 + Prepaid Insurance 1,100 + Equipment 12,000 + Drawing 1,000 = \$22,400; credits Accumulated Depreciation 200 + A/P 800 + Wages Payable 450 + Interest Payable 30 + Unearned 1,500 + Notes Payable 6,000 + Capital 10,000 = \$18,980.
6. Net income = $7,950 - 4,530 = \$3,420$. Balance-sheet difference = $22,400 - 18,980 = \$3,420$. They agree.
7. Write Net Income \$3,420 in the Income Statement debit column ($4,530 + 3,420 = 7,950$) and the Balance Sheet credit column ($18,980 + 3,420 = 22,400$).

Answer: Net income \$3,420; all five column pairs balance.

Example 2. Where does each of these go when extended: Unearned Revenue; Drawing; Accumulated Depreciation; Interest Expense; Accounts Receivable?

Show solution

1. Unearned Revenue: a liability, Balance Sheet credit.
2. Drawing: equity reduction, Balance Sheet debit (it is not an expense).
3. Accumulated Depreciation: contra-asset, Balance Sheet credit.
4. Interest Expense: Income Statement debit.
5. Accounts Receivable: asset, Balance Sheet debit.

Answer: Only revenues and expenses go to the Income Statement columns; everything else goes to the Balance Sheet columns.

Example 3. A worksheet's Income Statement columns total \$18,200 Dr and \$15,900 Cr. What does this mean, and how is it entered?

Show solution

1. Debits (expenses) exceed credits (revenue) by $18,200 - 15,900 = \$2,300$: a net loss.
2. Write Net Loss \$2,300 in the Income Statement credit column ($15,900 + 2,300 = 18,200$) and in the Balance Sheet debit column, since a loss reduces equity.

Answer: Net loss of \$2,300, entered on the opposite sides from a net income.

PRACTICE

1. **Easy** Name the five pairs of columns on a ten-column worksheet.

Show answer

Trial Balance, Adjustments, Adjusted Trial Balance, Income Statement, Balance Sheet.

2. **Easy** Is the worksheet a financial statement?

Show answer

No; it is an internal working paper used to prepare the statements.

3. **Easy** Who created VisiCalc, and when was it released?

Show answer

Dan Bricklin and Bob Frankston; 1979.

4. **Medium** To which column is each extended: Supplies Expense; Notes Payable; Owner's Capital; Fees Earned; Prepaid Rent?

Show answer

IS Dr; BS Cr; BS Cr; IS Cr; BS Dr.

5. **Medium** Cash is \$4,000 Dr on the trial balance and has no adjustment. Supplies is \$800 Dr with a \$520 credit adjustment. Give their adjusted balances.

Show answer

Cash \$4,000 Dr; Supplies \$280 Dr.

6. **Medium** Income Statement columns: Dr \$9,800, Cr \$14,350. Net income or loss, and where is it entered?

Show answer

Net income \$4,550: IS debit column and BS credit column.

7. **Medium** Why do the balance-sheet columns not balance until net income is added?

Show answer

Revenue and expenses have not yet been closed into capital, so the capital in the BS columns is the beginning amount; net income is the missing equity.

8. **Hard** An accountant extends Drawing \$2,000 into the Income Statement debit column by mistake. What net income will the worksheet show if the correct net income is \$6,000?

Show answer

\$4,000 (understated by \$2,000); the BS columns will also be off, but by the same amount, so the error is not caught by the check.

9. **Hard** Build the formula for the adjusted-trial-balance debit cell for an asset in a spreadsheet, if the trial-balance debit is in B5, credit in C5, adjustment debit in D5 and adjustment credit in E5.

Show answer

=MAX(B5 – C5 + D5 – E5, 0) for the debit cell (and =MAX(C5 – B5 + E5 – D5, 0) for the credit cell).

10. **Challenge** Complete the worksheet for Maple Street Music Lessons at June 30 using your Lesson 3.2 adjustments. Give the totals of each pair of columns and net income.

Show answer

TB 9,470 / 9,470; adjustments 463 / 463; adjusted TB 9,783 / 9,783; IS Dr 1,708, Cr 2,160, net income 452; BS Dr 8,075, Cr 7,623 (+ 452 = 8,075).

COMMON MISTAKES

- Extending Drawing to the Income Statement columns.
- Forgetting to add the new accounts created by adjustments.
- Entering net income on the same side in both pairs of columns.

Make it a game • Ten-Column March. Your parent gives you a pretend trial balance with six accounts and two adjustments. On a sheet of paper, extend every account across the worksheet columns: unadjusted, adjustments, adjusted, income statement and balance sheet. Time yourself, then compute net income and confirm that the last two columns balance. Repeat with new numbers and cut your time.

3.4 CLOSING ENTRIES: THE DAY OF RECKONING

OBJECTIVES

- Explain why temporary accounts are closed at the end of each period.
- Journalize and post the four closing entries using Income Summary.
- Prepare a post-closing trial balance.

Warm-up. A sports scoreboard shows the season's wins and losses. On opening day of the next season, what happens to the numbers? What carries over from last season (players, the stadium), and what starts at zero?

WATCH

CLOSING ENTRIES: Everything You Need To Know

Accounting Stuff • 13:58

<https://www.youtube.com/watch?v=e1z2lpdQyGQ>

WHEN TO WATCH

After the big idea and before the worked examples.

BACKUP VIDEO

FA18 - Closing Journal Entries EXPLAINED

Tony Bell • 9:34

https://www.youtube.com/watch?v=_nfi9b6QDd0

Before the practice set.

KEY TERMS

closing entries

Entries at the end of the period that transfer the balances of revenue, expense and drawing accounts into owner's capital, leaving the temporary accounts at zero.

Income Summary

A temporary clearing account used during closing: revenue and expenses are closed into it, and its balance (net income or loss) is then closed to capital.

post-closing trial balance

A trial balance prepared after closing; it lists only permanent accounts and proves the ledger is ready for the new period.

accounting cycle

The steps repeated each period: analyze and journalize, post, trial balance, adjust, adjusted trial balance (worksheet), statements, close, post-closing trial balance.

CORE IDEAS

The story. Jesus' parable of the talents tells of a man who entrusted his goods to three servants and went away; "after a long time the lord of those servants cometh, and reckoneth with them" (Matthew 25:19). Each servant gave an account, the faithful ones were praised and given more, and then a new period of stewardship began. Merchants long kept the same rhythm. The Fugger partners settled accounts every few years; English merchants "balanced" their books once a year, totaled the profit or loss, carried it to the owner's capital, and opened the new year's accounts.

How they figured it out. Revenue and expense accounts measure one period's activity. If they kept growing year after year, no one could tell what this year earned. So at the end of each period the bookkeeper empties them into capital, where the year's result belongs, and the next year starts at zero. Asset, liability and capital accounts are different: what the business owns and owes on December 31 it still owns and owes on January 1, so those balances carry forward.

The big idea. Closing takes four entries. (1) Debit each revenue account for its balance; credit Income Summary. (2) Debit Income Summary for total expenses; credit each expense account. (3) Debit Income Summary for its balance (net income); credit Capital. For a net loss, reverse: debit Capital, credit Income Summary. (4) Debit Capital; credit Drawing. After closing, every temporary account is zero and Capital equals the ending capital on the statement of owner's equity. A **post-closing trial balance** lists only the permanent accounts and must balance.

In business today. Accounting software closes the year automatically when you set a new fiscal year: it moves net income into retained earnings or capital and starts the income accounts at zero, and it can "lock" the closed period so no one can change it later. Accountants call the month-end and year-end work "the close," and how quickly and accurately a company closes its books is a mark of good management.

Think it through. Closing is a moment of reckoning: the results are counted, carried to the owner and locked. It is a good habit for a steward of anything to stop at regular times and ask, “What did I do with what was entrusted to me?”

PICTURE STUDY



The Parable of the Rich Man, Rembrandt van Rijn, 1627 · Oil on oak panel · Gemäldegalerie, Berlin

Image: [Wikimedia Commons](#), public domain

The young Rembrandt painted this scene from Jesus' parable in Luke 12 of the rich man who stored up goods and said to his soul, "take thine ease." By candlelight the old man examines a coin, surrounded by account books and bags of money.

Look closely

- Find the candle. Why does he shield it with his hand?
- Find the ledgers and papers. How many books can you count?
- Find the coin he is examining and the money bags.
- Notice how dark the room is around him.

Talk about it

1. He is counting at night, alone. What is the difference between reckoning faithfully and hoarding?
2. In the parable, God tells the man, "this night thy soul shall be required of thee." How does that change the meaning of a final reckoning?
3. What would a faithful steward do differently with the same books?

PROJECT

Close the Books for Maple Street Music Lessons

You will close the June books, post the closing entries and prove the ledger is ready for July.

You will need

- Your Maple Street ledger and worksheet from Lessons 2.3–3.3

Steps

1. Journalize the four closing entries on journal page J3.
2. Open an Income Summary account (number 399) and post the closing entries.
3. Check that every revenue, expense and drawing account now has a zero balance; rule a double line under each.
4. Check that Capital equals \$4,852.
5. Prepare the post-closing trial balance and check it: debits Cash 3,375, Accounts Receivable 310, Supplies 190, Equipment 3,600 = \$7,475; credits Accumulated Depreciation 50, Wages Payable 160, Interest Payable 13, Notes Payable 2,400, Capital 4,852 = \$7,475.
6. Write a paragraph comparing the June 30 post-closing trial balance with the June 30 trial balance before adjustments: which accounts disappeared, which appeared, and which changed?

Tips

- Close from the adjusted trial balance or the worksheet's Income Statement columns.
- Double-check that Drawing goes to Capital, not Income Summary.

Check your work

- ☐ All temporary accounts are zero after closing.
- ☐ My post-closing trial balance balances and lists only permanent accounts.
- ☐ I can explain why Income Summary's balance equals net income.

LEDGER NOTEBOOK

1. Draw a flow diagram: Revenue → Income Summary ← Expenses; Income Summary → Capital; Drawing → Capital.
2. Draw the accounting cycle as a circle with its steps.
3. Write Matthew 25:19 and one sentence on what a regular reckoning does for a steward.

From history. Some businesses use a fiscal year that ends in a quiet month: many retailers end theirs on the Saturday nearest January 31, after the holiday season, when inventory is low and easier to count.

WORKED EXAMPLES

Example 1. Journalize Summit Lawn Care's closing entries at July 31 from its adjusted trial balance (Service Revenue \$7,950; expenses: Wages 3,050, Fuel 400, Rent 200, Supplies 550, Insurance 100, Depreciation 200, Interest 30; Drawing \$1,000).

Show solution

1. (1) Debit Service Revenue \$7,950; credit Income Summary \$7,950.
2. (2) Debit Income Summary \$4,530; credit Wages Expense \$3,050; credit Fuel Expense \$400; credit Rent Expense \$200; credit Supplies Expense \$550; credit Insurance Expense \$100; credit Depreciation Expense \$200; credit Interest Expense \$30.
3. Income Summary now has a credit balance of $7,950 - 4,530 = \$3,420$, the net income.
4. (3) Debit Income Summary \$3,420; credit Eli Brooks, Capital \$3,420.
5. (4) Debit Eli Brooks, Capital \$1,000; credit Eli Brooks, Drawing \$1,000.
6. Capital: $10,000 + 3,420 - 1,000 = \$12,420$.

Answer: Four closing entries; ending Capital \$12,420; all temporary accounts zero.

Example 2. Prepare Summit's post-closing trial balance at July 31.

Show solution

1. Debits: Cash 6,200; Accounts Receivable 1,750; Supplies 350; Prepaid Insurance 1,100; Equipment 12,000. Total \$21,400.
 2. Credits: Accumulated Depreciation 200; Accounts Payable 800; Wages Payable 450; Interest Payable 30; Unearned Revenue 1,500; Notes Payable 6,000; Eli Brooks, Capital 12,420. Total \$21,400.
-

Answer: Post-closing trial balance totals \$21,400 = \$21,400; only permanent accounts appear.

Example 3. A business has revenue of \$28,000, expenses of \$31,500 and drawing of \$2,000; beginning capital is \$40,000. Journalize the closing of Income Summary and Drawing, and find ending capital.

Show solution

1. After closing revenue and expenses, Income Summary has a debit balance of $31,500 - 28,000 = \$3,500$ (a net loss).
 2. (3) Debit Capital \$3,500; credit Income Summary \$3,500.
 3. (4) Debit Capital \$2,000; credit Drawing \$2,000.
 4. Ending capital = $40,000 - 3,500 - 2,000 = \$34,500$.
-

Answer: Ending capital \$34,500.

PRACTICE

1. Easy Which accounts are closed?

Show answer

Temporary accounts: revenue, expense, drawing (and Income Summary).

2. Easy Which accounts appear on a post-closing trial balance?

Show answer

Only permanent accounts: assets, contra-assets, liabilities and capital.

3. **Easy** List the steps of the accounting cycle in order.

Show answer

Analyze and journalize; post; trial balance; adjust; adjusted trial balance or worksheet; prepare statements; close; post-closing trial balance.

4. **Medium** Journalize the closing of Fees Earned, \$12,600.

Show answer

Debit Fees Earned \$12,600; credit Income Summary \$12,600.

5. **Medium** Expenses: Rent 2,400; Wages 5,100; Utilities 380. Journalize their closing.

Show answer

Debit Income Summary \$7,880; credit Rent Expense \$2,400, Wages Expense \$5,100, Utilities Expense \$380.

6. **Medium** Using Problems 4 and 5, close Income Summary to capital.

Show answer

Debit Income Summary \$4,720; credit Capital \$4,720.

7. **Medium** Beginning capital \$15,000; net income \$4,720; drawing \$3,000. Ending capital?

Show answer

\$16,720.

8. **Hard** After closing, a bookkeeper sees that Wages Expense still has a \$300 debit balance. What happened and what should be done?

Show answer

That amount was left out of the expense closing entry (or posted after closing). Close it: Debit Income Summary \$300, credit Wages Expense \$300, and redo the close of Income Summary (net income is \$300 lower).

9. **Hard** Why is Drawing closed directly to Capital instead of to Income Summary?

Show answer

Drawing is not an expense and does not affect net income; closing it through Income Summary would understate the period's net income.

10. **Hard** Journalize the closing entries for Maple Street Music Lessons at June 30 (after the Lesson 3.2 adjustments: Fees Earned 2,160; Rent 1,200; Utilities 135; Supplies Expense 150; Depreciation 50; Wages 160; Interest 13; Drawing 600).

Show answer

(1) Dr Fees Earned 2,160, Cr Income Summary 2,160. (2) Dr Income Summary 1,708; Cr Rent 1,200, Utilities 135, Supplies Expense 150, Depreciation 50, Wages 160, Interest 13. (3) Dr Income Summary 452, Cr Capital 452. (4) Dr Capital 600, Cr Drawing 600. Ending capital $5,000 + 452 - 600 = \$4,852$.

11. **Challenge** Prepare Maple Street Music's post-closing trial balance at June 30 and show it balances.

Show answer

Debits: Cash 3,375; A/R 310; Supplies 190; Equipment 3,600 = \$7,475. Credits: Accumulated Depreciation 50; Wages Payable 160; Interest Payable 13; Notes Payable 2,400; Capital 4,852 = \$7,475.

COMMON MISTAKES

- Closing Drawing to Income Summary.
- Closing permanent accounts such as Accumulated Depreciation or Unearned Revenue.
- Forgetting to reverse the Income Summary entry for a net loss.

Make it a game • The Day of Reckoning Drill. In 45 seconds, name from memory the four closing entries, including Income Summary. Your parent then names accounts, such as Rent Expense, Drawing or Service Revenue, and you say whether each is temporary or permanent and which closing entry touches it. Finish by explaining what a post-closing trial balance should show. Correct answers earn a point.

Scripture. "After a long time the lord of those servants cometh, and reckoneth with them." (Matthew 25:19, KJV)

Closing the books is a small, regular reckoning: the results of the period are counted and carried to the owner, and a new period of stewardship begins.

3.5 THE FULL CYCLE: LINCOLN'S STORE AND A PRACTICE SET

OBJECTIVES

- Complete every step of the accounting cycle for a small service business, from transactions to the post-closing trial balance.
- Prepare simple financial statements from the adjusted trial balance.
- Explain how poor records and debt contributed to the failure of the Berry and Lincoln store.

Warm-up. List the steps of the accounting cycle from memory. Then check your list against Lesson 3.4. Which step did you forget, and why might a real bookkeeper skip it?

WATCH

The Accounting Cycle

Edspira • 4:03

<https://www.youtube.com/watch?v=X2MlBoniz-o>

WHEN TO WATCH

Before the practice set, as a map of the cycle.

BACKUP VIDEO

IFA4 – The Accounting Cycle Explained – Intermediate Accounting Review

Tony Bell • 5:48

<https://www.youtube.com/watch?v=PihFIQpiz2E>

After you finish the practice set, as a review.

KEY TERMS

practice set

A complete set of transactions for a business, worked through every step of the accounting cycle.

note payable

A written promise to pay a sum, usually with interest, by a certain date.

solvent / insolvent

Able (or unable) to pay debts as they come due.

CORE IDEAS

The story. In 1832 and 1833 the young Abraham Lincoln and his partner William F. Berry bought a general store in New Salem, Illinois, largely with promissory notes rather than cash; they later bought a second store's stock the same way. The village was small, many customers bought on credit, and the store did poorly. By 1834 the partnership had failed, Berry died in 1835, and Lincoln was left responsible for the firm's debts, about \$1,100, a large sum for a man who earned a few hundred dollars a year. He called it his "national debt," and he spent years paying it off in full, though the law might have let him escape part of it.

How they figured it out. What went wrong is visible in accounting terms. The partners bought assets (inventory) with liabilities (notes), so they had very little equity of their own. Sales on credit turned into receivables that were slow to collect. There is no evidence they kept careful books. A full accounting cycle each month (recording every credit sale, adjusting for interest owed on the notes, and preparing an income statement and balance sheet) would have shown early that the store was not earning enough to pay its debts.

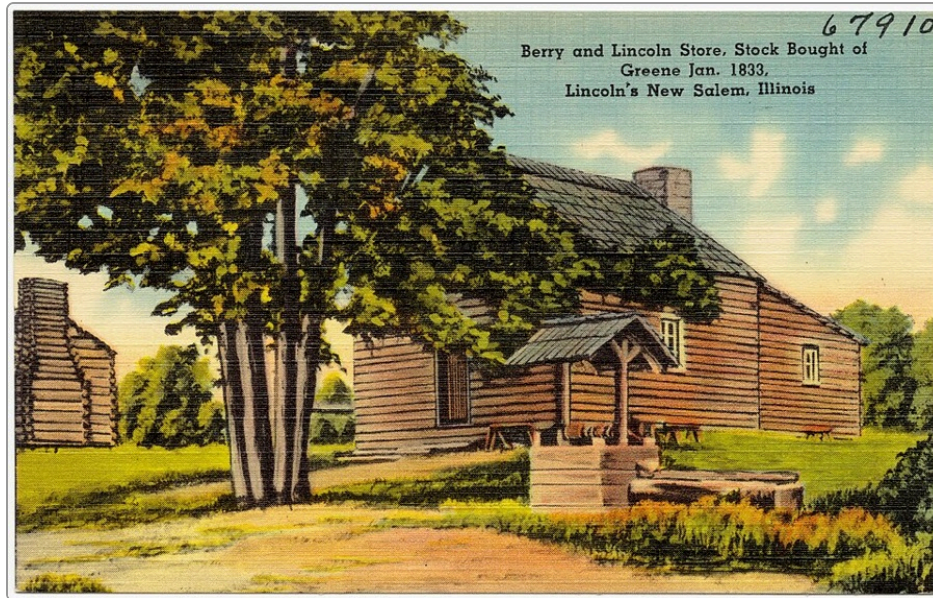
The big idea. The accounting cycle puts all of this unit together. (1) Analyze transactions from source documents. (2) Journalize. (3) Post to the ledger. (4) Prepare a trial balance. (5) Journalize and post adjusting entries. (6) Prepare an adjusted trial balance (or worksheet). (7) Prepare financial statements: income statement, statement of owner's equity, balance sheet. (8) Journalize and post closing entries. (9) Prepare a post-closing trial balance. Then the cycle begins again.

In business today. Small businesses that keep up with their books every month survive more often than those that do not, because their owners see trouble while there is still time to act: too much debt, slow collections, or expenses growing faster than revenue. Banks ask for monthly or quarterly statements from borrowers for the same reason.

Who gained? Lincoln's creditors were repaid in full because he kept his word. The reputation he earned in New Salem, "Honest Abe," followed him into law and

public life. A good name, Proverbs says, “is rather to be chosen than great riches” (Proverbs 22:1).

PICTURE STUDY



The Berry and Lincoln Store, Lincoln's New Salem, Tichnor Brothers, publisher (postcard), about 1930–1945 · Postcard, color halftone from a photograph · Lincoln's New Salem State Historic Site, Illinois (reconstructed store)

Image: [Wikimedia Commons](#), public domain

The log village of New Salem was rebuilt in the 1930s on its original site. This postcard shows the reconstructed Berry and Lincoln store, whose stock the partners bought from the Greene family in January 1833.

Look closely

- Find the door and windows. How much room would there be inside for goods?
- Look at the setting. How many customers could a store this size in a village this size expect?
- Find the porch. What might farmers have done there?
- Read the caption on the card.

Talk about it

1. What would the partners have needed to record each day to know whether the store was earning money?
2. Why is a store bought entirely with borrowed money especially risky?
3. Lincoln paid his store debts in full. How does that change how you see this small building?

PROJECT

A Complete Practice Set

You will work the full accounting cycle for Hope Valley Pet Care's second month (September) on your own, with the August balances carried forward.

You will need

- Hope Valley's August 31 post-closing trial balance (Worked Example 3)
- Journal, ledger and worksheet paper, or a spreadsheet
- Optional: GnuCash

Steps

1. Open ledger accounts with the August 31 post-closing balances.
2. Journalize September: Sep 2, pays \$120 wages payable from August. Sep 5, bills clients \$1,100. Sep 9, earns cash fees \$1,250. Sep 12, buys supplies on account, \$240. Sep 15, pays assistant \$450 (all for September work). Sep 18, collects \$900 on account. Sep 22, pays utilities \$170. Sep 25, pays \$240 on account. Sep 30, pays the note's two months of interest (\$20) and \$500 of principal. Sep 30, Ruth withdraws \$800.
3. Post and prepare an unadjusted trial balance.
4. Adjust at September 30: supplies on hand \$180; insurance \$75; depreciation \$100; one month of the advance earned \$300; assistant's wages owed \$90. (September's interest was paid on Sep 30, so no interest accrual is needed.)
5. Prepare a worksheet or adjusted trial balance.
6. Prepare the income statement, statement of owner's equity and balance sheet.
7. Journalize and post closing entries; prepare the post-closing trial balance.
8. Compare August and September: did the business do better or worse, and why?

Tips

- The Sep 30 payment covers August's accrued interest and September's: debit Interest Payable \$10, Interest Expense \$10 and Notes Payable \$500; credit Cash \$520.

- The Sep 2 payment of last month's wages is not a September expense.

Check your work

- ☐ Unadjusted trial balance totals \$9,405; adjusted trial balance \$9,595.
- ☐ September revenue \$2,650, expenses \$1,165, net income \$1,485; ending capital \$5,240.
- ☐ Post-closing trial balance totals \$7,630 on each side.

LEDGER NOTEBOOK

1. Draw the nine steps of the accounting cycle as a wheel.
2. Write a short account of Lincoln's "national debt" and what it teaches about promises.
3. Compare Hope Valley's August and September net income in a small table.

From history. The New Salem store's licensing records survive, but no ledger from the Berry and Lincoln store has ever been found. Much of what is known about its failure comes from the memories of New Salem neighbors collected after Lincoln's death.

WORKED EXAMPLES

Example 1. Hope Valley Pet Care, owned by Ruth Allen, opens August 1. Journalize its August transactions: Aug 1, Ruth invests \$4,000 cash. Aug 1, pays \$900 for a 12-month insurance policy. Aug 2, buys kennel equipment for \$3,600: \$1,600 cash and a \$2,000, 6% note. Aug 3, buys supplies on account, \$520. Aug 5, receives \$1,200 in advance for four months of weekly pet sitting (\$300 a month). Aug 10, earns cash fees, \$1,350. Aug 15, bills clients \$780. Aug 16, pays an assistant \$400. Aug 20, pays \$520 for the supplies. Aug 24, collects \$500 on account. Aug 28, pays utilities, \$160. Aug 31, Ruth withdraws \$700.

Show solution

1. Aug 1: Debit Cash \$4,000; credit Ruth Allen, Capital \$4,000.
2. Aug 1: Debit Prepaid Insurance \$900; credit Cash \$900.
3. Aug 2: Debit Equipment \$3,600; credit Cash \$1,600; credit Notes Payable \$2,000.
4. Aug 3: Debit Supplies \$520; credit Accounts Payable \$520.
5. Aug 5: Debit Cash \$1,200; credit Unearned Revenue \$1,200.
6. Aug 10: Debit Cash \$1,350; credit Service Revenue \$1,350.
7. Aug 15: Debit Accounts Receivable \$780; credit Service Revenue \$780.
8. Aug 16: Debit Wages Expense \$400; credit Cash \$400.
9. Aug 20: Debit Accounts Payable \$520; credit Cash \$520.
10. Aug 24: Debit Cash \$500; credit Accounts Receivable \$500.
11. Aug 28: Debit Utilities Expense \$160; credit Cash \$160.
12. Aug 31: Debit Ruth Allen, Drawing \$700; credit Cash \$700.
13. Unadjusted trial balance: debits Cash 2,770; A/R 280; Supplies 520; Prepaid Insurance 900; Equipment 3,600; Drawing 700; Wages 400; Utilities 160 = \$9,330. Credits: Unearned Revenue 1,200; Notes Payable 2,000; Capital 4,000; Service Revenue 2,130 = \$9,330. (Accounts Payable is zero.)

Answer: Unadjusted trial balance totals \$9,330.

Example 2. Adjust Hope Valley at August 31: supplies on hand \$210; one month of insurance expired; depreciation \$100; one month of the advance earned; assistant's wages owed \$120; one month of interest on the note. Prepare the adjusted trial balance.

Show solution

1. Supplies: Debit Supplies Expense \$310; credit Supplies \$310.
2. Insurance ($900 \div 12$): Debit Insurance Expense \$75; credit Prepaid Insurance \$75.
3. Depreciation: Debit Depreciation Expense \$100; credit Accumulated Depreciation \$100.
4. Unearned: Debit Unearned Revenue \$300; credit Service Revenue \$300.
5. Wages: Debit Wages Expense \$120; credit Wages Payable \$120.
6. Interest ($2,000 \times 6\% \times 1/12$): Debit Interest Expense \$10; credit Interest Payable \$10.
7. Adjusted debits: Cash 2,770; A/R 280; Supplies 210; Prepaid Insurance 825; Equipment 3,600; Drawing 700; Wages 520; Supplies Expense 310; Insurance 75; Depreciation 100; Interest 10; Utilities 160 = \$9,560.
8. Adjusted credits: Accumulated Depreciation 100; Wages Payable 120; Interest Payable 10; Unearned Revenue 900; Notes Payable 2,000; Capital 4,000; Service Revenue 2,430 = \$9,560.

Answer: Adjusted trial balance \$9,560 = \$9,560.

Example 3. Prepare Hope Valley's August statements and closing entries, and its post-closing trial balance.

Show solution

1. Income statement: Service Revenue \$2,430; expenses Wages 520 + Supplies 310 + Utilities 160 + Depreciation 100 + Insurance 75 + Interest 10 = \$1,175; net income \$1,255.
2. Statement of owner's equity: Capital, Aug 1, \$0 + investment 4,000 + net income 1,255 – drawing 700 = \$4,555.
3. Balance sheet: Cash 2,770 + A/R 280 + Supplies 210 + Prepaid Insurance 825 + Equipment 3,600 – Accumulated Depreciation 100 = total assets \$7,585.
Liabilities: Wages Payable 120 + Interest Payable 10 + Unearned Revenue 900 + Notes Payable 2,000 = \$3,030. Capital \$4,555. $3,030 + 4,555 = \$7,585$.
4. Closing: (1) Dr Service Revenue 2,430, Cr Income Summary 2,430. (2) Dr Income Summary 1,175; Cr the six expenses. (3) Dr Income Summary 1,255, Cr Capital 1,255. (4) Dr Capital 700, Cr Drawing 700.
5. Post-closing trial balance: debits $2,770 + 280 + 210 + 825 + 3,600 = \$7,685$; credits $100 + 120 + 10 + 900 + 2,000 + 4,555 = \$7,685$.

Answer: Net income \$1,255; ending capital \$4,555; total assets \$7,585; post-closing trial balance $\$7,685 = \$7,685$.

PRACTICE

1. Easy Why did the Berry and Lincoln store fail, in accounting terms?

Show answer

It bought inventory with notes (little equity), sold much on credit, earned too little, and could not pay its debts.

2. Easy How much did Lincoln owe after the store failed, and what did he do?

Show answer

About \$1,100; he repaid it in full over several years.

3. **Easy** Which three statements are prepared from the adjusted trial balance in this unit?

Show answer

Income statement, statement of owner's equity, balance sheet.

4. **Medium** Which steps of the cycle happen during the period and which only at the end?

Show answer

During: analyze, journalize, post. End: trial balance, adjust, adjusted trial balance or worksheet, statements, close, post-closing trial balance.

5. **Medium** In Hope Valley's books, why is the \$1,200 received on August 5 not all August revenue?

Show answer

It pays for four months of service; only one month (\$300) was earned in August, and \$900 remains unearned (a liability).

6. **Medium** Compute Hope Valley's August net income on the cash basis (count insurance and supplies as expenses when paid; equipment and drawing are not expenses).

Show answer

Cash from customers $1,200 + 1,350 + 500 = \$3,050$; cash paid for insurance 900, wages 400, supplies 520, utilities 160 = $\$1,980$. Cash-basis income $\$1,070$, versus $\$1,255$ accrual.

7. **Medium** What is the book value of Hope Valley's equipment at August 31?

Show answer

$3,600 - 100 = \$3,500$.

8. **Hard** If Ruth had forgotten the interest and wages accruals, what net income would she have reported and what would be wrong on the balance sheet?

Show answer

$1,255 + 130 = \$1,385$; liabilities understated by $\$130$ and equity overstated by $\$130$.

9. **Hard** A store owner buys \$5,000 of inventory entirely with a note and has \$300 of cash of her own. What share of the store's assets is owner's equity? Why is that dangerous?

Show answer

$300 \div 5,300 \approx 5.7\%$. Almost all assets are owed to creditors; a small loss wipes out equity and leaves her unable to pay.

10. **Hard** Explain Proverbs 22:1 in light of Lincoln's "national debt."

Show answer

Lincoln chose to keep his promise and repay in full rather than escape the debt; the trust he earned was worth more than the money.

11. **Challenge** Hope Valley's September transactions add \$2,600 of revenue earned and \$1,450 of expenses; Ruth withdraws \$800. What is the October 1 capital?

Show answer

$4,555 + (2,600 - 1,450) - 800 = \$4,905$.

COMMON MISTAKES

- Skipping the adjusting entries and preparing statements from the unadjusted trial balance.
- Forgetting to carry forward balances from the post-closing trial balance into the new month.
- Treating the payment of last month's wages payable as this month's expense.

Make it a game • Accounting Cycle Order Race. Write each step of the accounting cycle on a separate card, from analyzing transactions to the post-closing trial balance. Your parent shuffles them and you race to rebuild the order within ninety seconds. Then pick one step and teach it in a minute, using Lincoln's store as the example. Your parent adds one false detail for you to catch.

Scripture. "A good name is rather to be chosen than great riches, and loving favour rather than silver and gold." (Proverbs 22:1, KJV)

Lincoln repaid his store debts in full when he could have escaped part of them; the good name he earned was worth more than the money.

THE ACCOUNTING CYCLE

A business does not stop, so its accounts must be measured period by period. This unit begins with the change from the venture accounts of single voyages, like Jacob van Neck's fleet of 1599, to the periodic accounts of continuing companies. You will learn the accrual basis and the five kinds of adjusting entries (prepaid expenses, depreciation, unearned revenue, accrued expenses and accrued revenue), starting from Benjamin Franklin's fire-insurance company, which collected seven years of premiums at once.

Then you will organize the end-of-period work on a ten-column worksheet (the paper ancestor of VisiCalc and every modern spreadsheet), close the temporary accounts in a day of reckoning, and work the complete accounting cycle for a small business through two months. The story of Abraham Lincoln's failed store and his "national debt" shows why monthly books matter, and why a good name matters more.

PREREQUISITES

- Debits, credits, the journal, ledger and trial balance (Unit 2)
- Percents and simple interest: $\text{principal} \times \text{rate} \times \text{time}$
- Spreadsheet basics: entering numbers and simple formulas

MASTERY CHECKLIST

- ☐ I can explain the difference between cash and accrual accounting and apply the revenue recognition and matching principles.
- ☐ I can journalize all five kinds of adjusting entries and explain their effect on the statements.
- ☐ I can prepare a ten-column worksheet by hand and in a spreadsheet.
- ☐ I can journalize closing entries and prepare a post-closing trial balance.
- ☐ I can complete the full accounting cycle for a small service business.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- ***Principles of Accounting, Volume 1 (OpenStax), Chapters 4–5***: Free. The chapters on adjusting entries and completing the accounting cycle match this unit, with extra exercises and answers. Ages 15 and up.
- **GnuCash**: Free. Optional for the Lesson 3.5 practice set: enter the September transactions and compare GnuCash's reports with your hand-prepared statements.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

3.1	Accrual versus Cash: From Voyages to Periods	3 sessions of 50 minutes
3.2	Adjusting Entries: Franklin's Fire Insurance	3 sessions of 50 minutes
3.3	The Worksheet: Accountants' Spreadsheets	3 sessions of 50 minutes
3.4	Closing Entries: The Day of Reckoning	3 sessions of 50 minutes
3.5	The Full Cycle: Lincoln's Store and a Practice Set	3 sessions of 50 minutes

UNIT 3 TEST

Calculators are allowed. Show your work for every calculation. Every journal entry must balance. Answer the concept questions and the essay in complete sentences. The test is worth 100 points.

1. **5 pts**

Explain the difference between the cash basis and the accrual basis, and say which GAAP requires.

2. **6 pts**

In April a firm earns \$12,000 (collects \$8,000 in April, the rest in May), collects \$3,000 for March work, incurs \$7,500 of April expenses (pays \$6,000 in April, \$1,500 in May) and pays \$1,000 of March bills. Compute April net income on both bases.

3. **5 pts**

Why did the creation of the Dutch East India Company in 1602 push accounting toward periods instead of ventures?

4. **5 pts**

Supplies \$1,600 on the trial balance; \$450 on hand. Journalize the adjustment.

5. **5 pts**

A two-year insurance policy costing \$4,800 was bought on July 1. Journalize the December 31 adjustment (six months).

6. **5 pts**

Equipment costing \$18,000 with a \$3,000 salvage value has a 5-year life. Journalize one year of straight-line depreciation and give the book value after that year.

7. **5 pts**

A tenant paid \$7,200 on November 1 for six months' rent. Journalize the landlord's December 31 adjustment (two months).

8. **5 pts**

A \$12,000, 7% note was signed October 1. Journalize the December 31 interest accrual.

9. **5 pts**

Services worth \$1,400 were performed on December 29–31 and will be billed in January. Journalize the adjustment.

10. **6 pts**

A company forgot to accrue \$900 of wages and \$600 of revenue earned. Give the effect on net income, total assets, total liabilities and equity.

11. **6 pts**

On a worksheet, the Income Statement columns total Dr \$21,400 and Cr \$26,050. Find net income and state where it is entered.

12. **4 pts**

To which worksheet columns are these extended: Unearned Revenue; Drawing; Depreciation Expense; Accumulated Depreciation?

13. **8 pts**

Journalize the closing entries: Service Revenue \$19,000; Rent Expense \$4,800; Wages Expense \$8,200; Utilities Expense \$700; Drawing \$3,500.

14. **4 pts**

If beginning capital in Problem 13 was \$22,000, what is ending capital?

15. **5 pts**

Which accounts appear on the post-closing trial balance, and why?

16. **6 pts**

List the nine steps of the accounting cycle in order.

17. **15 pts**

Essay: Using the Berry and Lincoln store as your example, explain how a full monthly accounting cycle could have warned the partners of trouble. Mention at least three specific accounts or adjustments, and close with what Lincoln's repayment of his "national debt" teaches about character in business.

ANSWER KEY

1. Cash basis records revenue and expenses when cash moves; accrual records revenue when earned and expenses when incurred. GAAP requires accrual.
2. Accrual $12,000 - 7,500 = \$4,500$. Cash $(8,000 + 3,000) - (6,000 + 1,000) = \$4,000$.
3. The VOC was a continuing company with overlapping voyages and permanent assets; there was no single end at which to measure profit, so profit had to be measured by period.
4. Debit Supplies Expense \$1,150; credit Supplies \$1,150.
5. $4,800 \div 24 \times 6 = \$1,200$. Debit Insurance Expense \$1,200; credit Prepaid Insurance \$1,200.
6. $(18,000 - 3,000) \div 5 = \$3,000$. Debit Depreciation Expense \$3,000; credit Accumulated Depreciation \$3,000. Book value \$15,000.
7. Debit Unearned Rent Revenue \$2,400; credit Rent Revenue \$2,400.
8. $12,000 \times 0.07 \times 3/12 = \$210$. Debit Interest Expense \$210; credit Interest Payable \$210.
9. Debit Accounts Receivable \$1,400; credit Service Revenue \$1,400.
10. Net income overstated by 900 and understated by 600: overstated by \$300 net. Assets understated by \$600. Liabilities understated by \$900. Equity overstated by \$300.
11. \$4,650 net income; entered in the Income Statement debit column and the Balance Sheet credit column.
12. BS Cr; BS Dr; IS Dr; BS Cr.
13. (1) Dr Service Revenue 19,000, Cr Income Summary 19,000. (2) Dr Income Summary 13,700; Cr Rent 4,800, Wages 8,200, Utilities 700. (3) Dr Income Summary 5,300, Cr Capital 5,300. (4) Dr Capital 3,500, Cr Drawing 3,500.
14. $22,000 + 5,300 - 3,500 = \$23,800$.
15. Only permanent accounts (assets, contra-assets, liabilities, capital), because all temporary accounts have been closed to zero.
16. Analyze; journalize; post; trial balance; adjusting entries; adjusted trial balance or worksheet; financial statements; closing entries; post-closing trial balance.
17. A strong answer names accounts such as Notes Payable (heavy debt bought the stock), Accounts Receivable (slow credit sales), Interest Expense or Interest Payable accruals, Inventory and Owner's Equity (very little), explains that

monthly income statements and balance sheets would have shown low profit and rising debt, and reflects on Lincoln keeping his word and repaying in full.

PORTFOLIO PIECE: TWO MONTHS OF COMPLETE BOOKS

Keep two consecutive months of complete books for a real or invented service business, with at least 15 transactions each month. For each month, journalize, post, prepare a trial balance, adjust (at least four kinds of adjustment), complete a worksheet in a spreadsheet with check cells, prepare the three statements, close, and prepare a post-closing trial balance. Carry the first month's balances into the second. Write a one-page letter to the owner comparing the two months.

LOOK FOR	WHAT IT MEANS
Recording	All transactions journalized and posted correctly with posting references.
Adjustments	At least four kinds of adjustment each month, correctly computed and explained.
Worksheet and statements	Spreadsheet worksheet with working check cells; statements properly headed and in agreement with the worksheet.
Closing	Closing entries correct; post-closing trial balances balance; balances carried forward correctly.
Letter	Clearly compares the two months using the statements and gives one specific recommendation.

FINANCIAL STATEMENTS

Financial statements are where all the bookkeeping becomes useful. In this unit you will prepare the four basic statements, each with a story of the people who needed it: Josiah Wedgwood's search in 1772 for which of his wares really earned money (the income statement); Benjamin Franklin's profit-sharing partnership with David Hall (the statement of owner's equity); the Bank of England, forced to lay its accounts before Parliament and later publishing them every week (the balance sheet); and the bank runs of 1931, which showed that a business can be profitable and still run out of cash (the statement of cash flows).

You will prepare all four for a hardware store, see how they fit together, and then read a real public company's annual report, following a tradition that runs from U.S. Steel's audited report for 1902 through the securities laws of 1933 and 1934 to today's Form 10-K. You will judge what the statements tell each of the six stakeholders, and what they cannot tell.

PREREQUISITES

- The full accounting cycle (Unit 3)
- Percents and percent change
- Spreadsheet formulas

MASTERY CHECKLIST

- ☐ I can prepare single-step and multi-step income statements and compute margins.
- ☐ I can prepare a statement of owner's equity and explain how the statements articulate.
- ☐ I can prepare a classified balance sheet and compute working capital and the current ratio.
- ☐ I can prepare a statement of cash flows by the indirect method and explain why profit and cash differ.
- ☐ I can find and interpret the key figures, notes and auditor's opinion in a real annual report, and write a stakeholder report.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **SEC EDGAR (search “EDGAR” at sec.gov):** Free. Every U.S. public company’s 10-K and annual report, searchable by company name. No account is needed. Use with a parent for the Lesson 4.5 project.
- **Investor.gov (U.S. Securities and Exchange Commission):** Free investor-education site from the SEC, including a plain-English guide to reading financial statements. Ages 15 and up.
- **The Way to Wealth, by Benjamin Franklin (1758):** Free on Project Gutenberg. Franklin’s collected sayings on industry and thrift, from *Poor Richard’s Almanack*. Read it with Lesson 4.2.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

4.1 The Income Statement: Wedgwood Finds His Costs	3 sessions of 50 minutes
4.2 The Statement of Owner’s Equity: Franklin and Hall	3 sessions of 50 minutes
4.3 The Balance Sheet: The Bank of England Reports	3 sessions of 50 minutes
4.4 The Statement of Cash Flows: Profitable and Broke	3 sessions of 50 minutes
4.5 Reading a Real Annual Report: U.S. Steel to the 10-K	3 sessions of 50 minutes

UNIT 4 TEST

Calculators are allowed. Show your work. Statements must have proper three-line headings. Answer concept questions and the essay in complete sentences. The test is worth 100 points.

1. **4 pts**

Name the four basic financial statements and say which is at a point in time.

2. **8 pts**

From these balances prepare a multi-step income statement: Sales \$180,000; COGS \$112,000; Wages \$34,000; Rent \$9,600; Utilities \$2,900; Depreciation \$3,500; Interest expense \$1,800.

3. **4 pts**

Compute the gross margin and net margin for Problem 2.

4. **6 pts**

Beginning capital \$52,000; additional investment \$6,000; net income \$16,200; withdrawals \$20,000. Prepare the statement of owner's equity calculation.

5. **10 pts**

Prepare a classified balance sheet and prove it: Cash 7,400; Accounts Receivable 6,100; Inventory 18,500; Prepaid Rent 1,200; Equipment 40,000; Accumulated Depreciation 14,000; Accounts Payable 8,300; Wages Payable 900; Note Payable 20,000 (\$4,000 due next year); Owner's Capital 30,000.

6. **4 pts**

Compute working capital and the current ratio for Problem 5.

7. **6 pts**

Classify as operating, investing or financing: sale of land; payment of wages; borrowing from a bank; owner withdrawal; purchase of a computer; collections from customers.

8. **8 pts**

Net income \$30,000; depreciation \$6,000; A/R increased \$4,500; inventory decreased \$2,000; A/P decreased \$1,500; wages payable increased \$700. Compute operating cash flow.

9. **6 pts**

With Problem 8's operating cash flow, the company bought equipment for \$25,000, borrowed \$10,000 and the owner withdrew \$15,000. Beginning cash \$8,000. Ending cash?

10. (5 pts)

What did Wedgwood learn about fixed costs in 1772, and how did he use it?

11. (5 pts)

Explain “articulation” of the statements.

12. (5 pts)

Why can a profitable business run out of cash? Give two reasons.

13. (5 pts)

What did the Securities Acts of 1933 and 1934 require, and what is Form 10-K?

14. (4 pts)

Revenue rose from \$2.40 billion to \$2.64 billion. Percent change?

15. (5 pts)

What does an auditor’s report say, and why does it matter to a lender?

16. (15 pts)

Essay: Choose four of the six stakeholders. For each, name the statement and one specific figure or ratio that would matter most to that group, and one important question the statements cannot answer for them.

ANSWER KEY

1. Income statement, statement of owner's equity, balance sheet, statement of cash flows; the balance sheet is at a point in time.
2. Gross profit 68,000; operating expenses 50,000; operating income 18,000; net income 16,200.
3. $68,000 \div 180,000 \approx 37.8\%$; $16,200 \div 180,000 = 9\%$.
4. $52,000 + 6,000 + 16,200 - 20,000 = \$54,200$.
5. Current assets 33,200; PP&E $40,000 - 14,000 = 26,000$; total assets 59,200. Current liabilities $8,300 + 900 + 4,000 = 13,200$; long-term liabilities 16,000; total liabilities 29,200; capital 30,000; total 59,200.
6. Working capital $33,200 - 13,200 = \$20,000$; current ratio $33,200 \div 13,200 \approx 2.52$.
7. Investing; operating; financing; financing; investing; operating.
8. $30,000 + 6,000 - 4,500 + 2,000 - 1,500 + 700 = \$32,700$.
9. $32,700 - 25,000 + 10,000 - 15,000 = +2,700$; ending cash \$10,700.
10. Many costs stayed the same regardless of output, so larger production runs lowered the cost per piece; he pushed for longer runs and set prices from real costs.
11. Net income flows from the income statement to the statement of owner's equity; ending capital flows to the balance sheet; the change in cash on the cash-flow statement equals the change in the balance sheet's cash.
12. Sales on credit not yet collected; cash tied up in inventory; large equipment purchases; loan repayments; owner withdrawals.
13. Audited financial statements for companies selling securities to the public and regular reports for listed companies, enforced by the SEC; the 10-K is the annual report filed with the SEC.
14. $0.24 \div 2.40 = 10\%$.
15. The independent auditor's opinion on whether the statements fairly present the company's position and results under GAAP; a lender relies on it because it cannot inspect the books itself.
16. A strong answer pairs stakeholders with appropriate figures (for example, lenders: current ratio, interest coverage, operating cash flow; owners: net income and margin; workers: profitability and cash to meet payroll; community: size and stability), and honestly names limits (working conditions,

product quality, honesty with customers, community effects) that require other evidence.

PORTFOLIO PIECE: A COMPLETE SET OF STATEMENTS AND A STAKEHOLDER REPORT

Prepare a complete set of four financial statements (income statement, statement of owner's equity, classified balance sheet and statement of cash flows) for a business whose books you kept in Units 2–3 or for a realistic case with two years of balance sheets. Add a one-page analysis with margins, working capital, the current ratio and the change in cash explained. Then attach your Lesson 4.5 stakeholder report on a real public company.

LOOK FOR	WHAT IT MEANS
Statements	All four statements properly headed, correctly classified, articulating with one another, and balanced.
Cash flows	Indirect method done correctly; net change proved against the balance sheets.
Analysis	Margins, working capital and current ratio computed and interpreted in plain words.
Stakeholder report	Uses real figures from a real annual report, rates all six stakeholders with reasons, and admits the limits of the evidence.

4.1 THE INCOME STATEMENT: WEDGWOOD FINDS HIS COSTS

OBJECTIVES

- Prepare single-step and multi-step income statements with proper headings.
- Compute gross profit, operating income and net income, and the gross and net profit margins.
- Explain how Josiah Wedgwood used cost records to find which products earned money.

Warm-up. Think of a lemonade stand that sold \$80 of lemonade. Its lemons and sugar cost \$30, the cups \$6, and the sign \$4. Did it make \$80? \$50? Something else? Write what you would want to know before answering.

WATCH

The INCOME STATEMENT Explained (Profit & Loss / P&L).

Accounting Stuff · 11:25

<https://www.youtube.com/watch?v=hrSUq4wcd0g>

WHEN TO WATCH

After the big idea and before the worked examples.

BACKUP VIDEO

Income statement explained

The Finance Storyteller · 11:52

<https://www.youtube.com/watch?v=Hq-44PHgAiU>

After the worked examples, to see a large company's income statement.

KEY TERMS

income statement

The report of revenues, expenses and net income (or net loss) for a period of time. Also called the profit and loss statement (P&L) or statement of operations.

cost of goods sold (COGS)

The cost of the merchandise a business sold during the period (Unit 6).

gross profit

Net sales minus cost of goods sold:
what is left to pay operating expenses
and provide a profit.

operating expenses

The costs of running the business
other than cost of goods sold: wages,
rent, utilities, advertising,
depreciation, insurance and supplies.

operating income

Gross profit minus operating expenses:
the profit from the business's main
activity, before other income and
expenses such as interest.

profit margin

A profit figure as a percent of sales:
gross margin = gross profit ÷ sales; net
margin = net income ÷ sales.

CORE IDEAS

The story. Josiah Wedgwood (1730–1795) built the most famous pottery in England at Etruria in Staffordshire, opened in 1769, and sold cream-colored tableware and ornamental vases to customers from Queen Charlotte to ordinary families. In 1772 a credit crisis swept Britain, orders dried up, and Wedgwood found himself with warehouses full of goods and money tight. He wrote to his partner Thomas Bentley that he must find out what each kind of ware really cost to make. Through the summer and autumn he worked through his books, piece by piece and process by process.

How they figured it out. What Wedgwood found surprised him. Some costs (rent, the managers' salaries, the kilns) stayed nearly the same whether the works made many pots or few, so making more pieces lowered the cost of each one. Some vases had been sold for less than they cost to make, because his prices had been set by guess and custom. And he discovered that his chief clerk had been stealing from the firm and keeping careless accounts. Wedgwood changed his prices, pushed for longer production runs to spread his fixed costs, and kept regular accounts from then on. Historians count him among the founders of cost accounting.

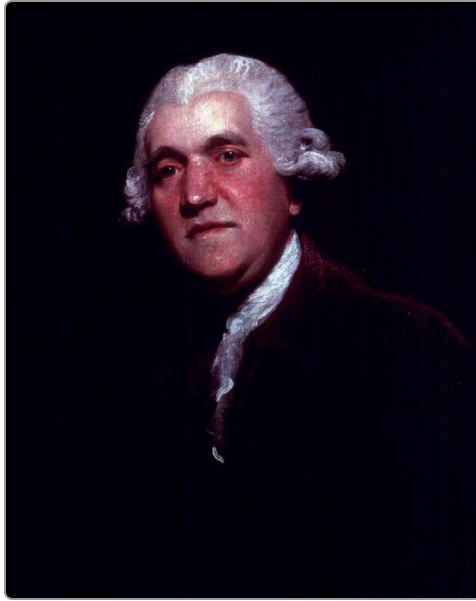
The big idea. The **income statement** reports a business's performance *over a period*. Its heading has three lines: the business name, the statement name, and the period ("For the Year Ended December 31, 20—"). A **single-step** statement lists all revenues, then all expenses, and subtracts. A **multi-step** statement shows the layers: net sales – cost of goods sold = **gross profit**; gross profit – operating expenses = **operating income**; operating income ± other income and expenses (interest) = **net income**.

Dividing by sales gives margins: a 40% gross margin means each \$1 of sales leaves 40¢ after paying for the goods sold.

In business today. Every company publishes an income statement each quarter and year. Managers break it down by product line, store or region, just as Wedgwood broke down his costs by ware, to see which parts of the business earn money. Lenders look at operating income to see whether the business can cover its interest. Owners compare margins from year to year: falling margins can mean rising costs or prices set too low.

Think it through. Wedgwood's lesson still holds: a business can be busy and still lose money on some of what it sells. Only honest cost records show where.

PICTURE STUDY



Josiah Wedgwood, Sir Joshua Reynolds, 1782 · Oil on canvas · Wedgwood Museum (V&A Wedgwood Collection), Barlaston

Image: [Wikimedia Commons](#), public domain

Reynolds, the first president of the Royal Academy, painted Wedgwood ten years after his cost study, when the Etruria works was prospering. The portrait stayed in the Wedgwood family.

Look closely

- Look at his clothes. Do they show a showy man or a sober one?
- Look at his expression. What does Reynolds want you to think about him?
- Notice the dark, plain background. What does it make you look at?
- Compare this with the portraits of merchants by Holbein. What is missing from this one?

Talk about it

1. Wedgwood was a potter, an inventor and a careful keeper of accounts. Which of these does the portrait show, and which does it hide?
2. Why might a successful manufacturer still need to study his costs line by line?
3. Who besides Wedgwood (workers, customers, the town) depended on Etruria earning a profit?

PROJECT

Cost Out a Product and Build Its Income Statement

You will find the full cost of something you can make, decide whether its price earns a profit, and prepare an income statement for a month of sales.

You will need

- A product you or your family can make (cookies, bread, birdhouses, bookmarks, garden plants), or the sample data
- Store receipts or online prices for materials
- Ledger notebook or spreadsheet

Steps

1. Choose a product and write the recipe or plan for one batch.
2. List every material with its cost per batch, using real receipts or current prices. Include small items (paper bags, labels, electricity estimate).
3. Separate costs into variable (per batch) and fixed (per month: a mixer, a table, a booth fee spread over the months you expect to use it).
4. Compute the cost per unit at a small volume (e.g., 2 batches a month) and a larger volume (e.g., 8 batches).
5. Set a price, and compute the gross profit per unit and the gross margin.
6. Prepare a multi-step income statement for one month at your expected volume, with sales, cost of goods sold, gross profit, operating expenses, and net income.
7. Compute the net margin, and the volume at which the profit becomes zero.
8. Write a paragraph, as Wedgwood might to Bentley, about what you discovered: which costs surprised you, and what you would change about price or volume.

Tips

- Do not forget your own time; note what an hour of your work is worth even if you do not pay yourself.
- Selling food requires a parent's supervision and may require local permission; this project only needs the numbers.

Check your work

- ☐ My cost sheet lists every material with a source for its price.
- ☐ My income statement is properly headed and in multi-step form.
- ☐ I can explain why the cost per unit falls as volume rises.

LEDGER NOTEBOOK

1. Draw the multi-step income statement as a staircase from sales down to net income.
2. Copy Greenleaf's income statement with its three-line heading.
3. Write Wedgwood's three discoveries and one lesson for your own business.

KEY FORMULAS

Gross profit = Net sales – COGS

Operating income = Gross profit – Operating expenses

Net income = Operating income ± Other income and expenses

Gross margin = $\frac{\text{Gross profit}}{\text{Net sales}}$, Net margin = $\frac{\text{Net income}}{\text{Net sales}}$

From history. Wedgwood's partner Thomas Bentley ran the London showroom and handled the ornamental wares. Their surviving letters, now in the Wedgwood archive, are among the richest records of how an eighteenth-century manufacturer thought about prices, costs and customers.

WORKED EXAMPLES

Example 1. Prepare a multi-step income statement for Greenleaf Hardware for the year. Greenleaf Hardware, owned by Thomas Greene, has these adjusted balances at December 31: Cash \$19,800; Accounts Receivable \$9,600; Merchandise Inventory \$32,500; Prepaid Insurance \$1,800; Supplies \$700; Land \$25,000; Building \$120,000; Accumulated Depreciation–Building \$36,000; Equipment \$30,000; Accumulated Depreciation–Equipment \$12,000; Accounts Payable \$14,200; Wages Payable \$1,300; Interest Payable \$600; Unearned Revenue \$900; Notes Payable, current portion \$5,000; Notes Payable, long-term \$60,000; T. Greene, Capital (January 1) \$96,000; T. Greene, Drawing \$30,000; Sales Revenue \$310,000; Cost of Goods Sold \$186,000; Wages Expense \$52,000; Utilities Expense \$6,800; Insurance Expense \$2,400; Supplies Expense \$1,500; Depreciation Expense \$9,000; Advertising Expense \$4,100; Interest Expense \$4,800. (Debits and credits each total \$536,000.)

Show solution

1. Heading: Greenleaf Hardware / Income Statement / For the Year Ended December 31, 20—.
2. Sales revenue \$310,000 – Cost of goods sold \$186,000 = Gross profit \$124,000.
3. Operating expenses: Wages 52,000 + Utilities 6,800 + Insurance 2,400 + Supplies 1,500 + Depreciation 9,000 + Advertising 4,100 = \$75,800.
4. Operating income = 124,000 – 75,800 = \$48,200.
5. Other expense: Interest expense \$4,800.
6. Net income = 48,200 – 4,800 = \$43,400.

Answer: Gross profit \$124,000; operating income \$48,200; net income \$43,400.

Example 2. Compute Greenleaf's gross margin and net margin, and prepare its single-step income statement.

Show solution

1. Gross margin = $124,000/310,000 = 0.40 = 40\%$.
2. Net margin = $43,400/310,000 = 0.14 = 14\%$.
3. Single-step: Revenues \$310,000. Expenses: COGS 186,000 + operating expenses 75,800 + interest 4,800 = \$266,600. Net income = $310,000 - 266,600 = \$43,400$.

Answer: Gross margin 40%; net margin 14%; the single-step statement shows the same \$43,400.

Example 3. A potter makes 2,000 vases a month. Fixed costs (rent, kilns, managers) are \$3,000 a month; clay, glaze and labor cost \$2.50 a vase. Find the cost per vase. Then find it at 3,000 vases. If vases sell for \$3.80, what is the monthly profit at each volume?

Show solution

1. At 2,000 vases: total cost = $3,000 + 2.50 \times 2,000 = \$8,000$; per vase $8,000 \div 2,000 = \$4.00$.
2. At 3,000 vases: total cost = $3,000 + 2.50 \times 3,000 = \$10,500$; per vase $10,500 \div 3,000 = \$3.50$.
3. Profit at 2,000: $3.80 \times 2,000 - 8,000 = 7,600 - 8,000 = -\$400$ (a loss).
4. Profit at 3,000: $3.80 \times 3,000 - 10,500 = 11,400 - 10,500 = \$900$.

Answer: Cost per vase falls from \$4.00 to \$3.50; a \$400 loss becomes a \$900 profit. This is what Wedgwood found when he spread fixed costs over longer runs.

PRACTICE

1. Easy What three lines head an income statement?

Show answer

Business name; "Income Statement"; the period, such as "For the Year Ended December 31, 20—."

2. Easy Why does an income statement cover a period, not a single date?

Show answer

Revenue and expenses accumulate over time; the statement measures performance during that time.

3. Easy Sales \$90,000; COGS \$54,000. Gross profit and gross margin?

Show answer

\$36,000; 40%.

4. Medium Gross profit \$36,000; operating expenses \$24,500; interest expense \$1,200. Operating income and net income?

Show answer

\$11,500; \$10,300.

5. Medium A service business has fees of \$64,000 and expenses of rent 12,000, wages 30,000, utilities 2,400, depreciation 3,600. Prepare a single-step result.

Show answer

Expenses \$48,000; net income \$16,000.

6. Medium Where does Owner's Drawing appear on the income statement?

Show answer

Nowhere; it is not an expense. It appears on the statement of owner's equity.

7. Medium What three things did Wedgwood discover in his 1772 cost study?

Show answer

Fixed costs made larger runs cheaper per piece; some wares were priced below cost; his chief clerk had been stealing and keeping careless accounts.

8. Hard Net sales \$250,000; net margin 6%; operating expenses \$70,000; interest expense \$5,000. Find net income, operating income, gross profit and COGS.

Show answer

Net income 15,000; operating income 20,000; gross profit 90,000; COGS 160,000.

9. **Hard** Fixed costs \$6,000 a month; variable cost \$8 per unit; price \$12. Find the profit or loss at 1,200 and at 2,000 units.

Show answer

1,200: $14,400 - (6,000 + 9,600) = -\$1,200$. 2,000: $24,000 - 22,000 = \$2,000$.

10. **Hard** Gross margin fell from 42% to 36% while sales grew. Give two possible causes.

Show answer

Costs of goods rose faster than prices; prices were cut (discounts) or the sales mix shifted to lower-margin products; theft or waste of inventory.

11. **Challenge** A company reports net income of \$120,000 on sales of \$1.5 million. A manager says the company makes 8¢ on every dollar of sales. Is he right, and what else would you want to know before judging the company?

Show answer

Yes, net margin is 8%. You would want margins over several years, comparison with similar firms, the cash flow behind the income, and whether any one-time items affected it.

COMMON MISTAKES

- Putting Drawing among the expenses.
- Dating the income statement “December 31” instead of “For the Year Ended December 31.”
- Confusing gross profit with net income.

Make it a game • Cost It Out Duel. Pick a household product, such as a loaf of bread. Each of you secretly estimates materials, labor and the selling price. Reveal and calculate cost of goods sold, gross profit and gross margin. The closer estimate to a realistic margin wins the round. Then explain why Wedgwood's study of his costs changed his pricing, and build a multi-step income statement.

Scripture. “In all labour there is profit: but the talk of the lips tendeth only to penury.” (Proverbs 14:23, KJV)

Profit comes from real work, not from talk; and the income statement is how a business finds out whether its labor really is profitable.

4.2 THE STATEMENT OF OWNER'S EQUITY: FRANKLIN AND HALL

OBJECTIVES

- Prepare a statement of owner's equity showing beginning capital, investments, net income or loss, withdrawals and ending capital.
- Explain how the statement links the income statement to the balance sheet.
- Analyze how an owner's withdrawals and investments affect equity over several years.

Warm-up. You start the summer with \$200 saved. You earn \$650 mowing lawns, your grandparents give you \$100 for your business, and you spend \$300 on yourself. How much is “your” money at the end of the summer? Write each step.

WATCH

The Statement of Stockholders' Equity.

Edspira • 4:54

<https://www.youtube.com/watch?v=LvrzzPi2XRI>

WHEN TO WATCH

After the big idea. It shows the corporate version (Unit 8); the owner's-equity statement in this lesson follows the same pattern with capital and drawing.

KEY TERMS

statement of owner's equity

A report showing the changes in the owner's capital during the period:
 $\text{beginning capital} + \text{investments} + \text{net income} - \text{net loss} - \text{withdrawals} = \text{ending capital}.$

owner investment

Cash or other assets the owner puts into the business; it increases capital and is not revenue.

withdrawals (drawing)

Assets the owner takes out for personal use; they reduce capital and are not expenses.

articulation

The way the financial statements fit together: net income flows from the income statement to the statement of owner's equity, and ending capital flows to the balance sheet.

CORE IDEAS

The story. Benjamin Franklin opened his own printing shop in Philadelphia in 1728 and, through hard work and his famous *Poor Richard's Almanack*, made it the most successful press in the colonies. In 1748, at age 42, he decided to step back from daily work to give his time to science and public service. He formed a partnership with his foreman, David Hall: Hall would run the shop, and Franklin, who supplied the press, type and established business, would receive half the profits for eighteen years. The arrangement lasted from 1748 to 1766, and the yearly payments gave Franklin a comfortable income for his experiments and his public work.

How they figured it out. A partnership like Franklin and Hall's needs a clear record of each owner's stake: what each put in, what share of profit belonged to each, and what each took out. At the end, in 1766, the partners settled their accounts. Hall bought Franklin's share of the shop, and the books had to show exactly what Franklin's capital was. The statement of owner's equity is the report that tracks that stake.

The big idea. The **statement of owner's equity** shows why capital changed during the period: *Beginning capital + Owner investments + Net income – Withdrawals = Ending capital*. (A net loss is subtracted.) It is prepared after the income statement, because it needs net income, and before the balance sheet, because the balance sheet needs ending capital. This linking of the statements is called **articulation**. Note that investments and withdrawals are transactions between the business and its owner; they change equity but are never revenue or expense.

In business today. Every sole proprietorship and partnership keeps this statement, and corporations keep a larger version, the statement of stockholders' equity (Unit 8). Lenders read it to see whether the owner is leaving profit in the business to help it grow or taking it all out. A business whose owner withdraws more than it earns, year after year, is shrinking its equity and its safety cushion.

Think it through. Franklin wrote in *The Way to Wealth* (1758) that “a small leak will sink a great ship.” Steady withdrawals larger than income are such a leak.

PICTURE STUDY



Franklin the Printer, Charles E. Mills, about 1914 · Painting (reproduced as a print) · Original painting for the Curtis Publishing Company, Philadelphia

Image: [Wikimedia Commons](#), public domain

This early twentieth-century painting imagines Franklin as a working printer. The hand press, the type cases and the stacks of paper were the assets of his business, and the source of the profits he later shared with David Hall.

Look closely

- Find the press and the sheet of paper being printed.
- Find the type cases. What is kept in them?
- What is Franklin wearing? What does it say about his work?
- Look for other workers or customers.

Talk about it

1. Which things in the picture were Franklin's investment in the Franklin and Hall partnership?
2. Why would both partners want a clear yearly record of each one's share?
3. How did steady work at the press make Franklin's later public service possible?

PROJECT

Five Years of an Owner's Equity

You will model how an owner's choices about withdrawals change a business's equity over five years, using a spreadsheet.

You will need

- Spreadsheet software
- Ledger notebook

Steps

1. Set up columns: Year, Beginning Capital, Investments, Net Income, Withdrawals, Ending Capital.
2. Start with \$30,000 of capital. Assume net income of \$18,000 in Year 1, growing 5% a year.
3. Scenario A: the owner withdraws \$12,000 each year. Scenario B: the owner withdraws 100% of net income each year. Scenario C: the owner withdraws \$22,000 each year.
4. Write formulas so each year's beginning capital equals the prior year's ending capital.
5. Compute ending capital in each scenario after five years.
6. Prepare a formal statement of owner's equity for Year 3 of Scenario A.
7. Make a line chart of ending capital for the three scenarios.
8. Write a paragraph: which scenario would a bank prefer for a loan, and why? What does the business give up in Scenario A, and what does the owner give up?

Tips

- Use absolute references (like \$B\$2) for the growth rate so you can change it in one place.
- Round only for display, not in the formulas.

Check your work

- ☐ My formulas carry capital forward correctly year to year.

- ☐ My Year 3 statement is properly headed and agrees with the spreadsheet.
- ☐ I can explain the trade-off between withdrawing profit and leaving it in the business.

LEDGER NOTEBOOK

1. Draw three boxes, Income Statement → Statement of Owner's Equity → Balance Sheet, with arrows showing what flows between them.
2. Copy Greenleaf's statement of owner's equity.
3. Write Franklin's saying about the small leak and what it means for withdrawals.

KEY FORMULAS

Ending capital = Beginning capital + Investments + Net income – Withdrawals

From history. Franklin's partnership with Hall was one of several he set up with former journeymen in other colonies, in South Carolina, New York and elsewhere: he supplied the press and type, they ran the shops, and they shared the profits. It was an early chain of print shops, built on contracts and honest accounts.

WORKED EXAMPLES

Example 1. Prepare Greenleaf Hardware's statement of owner's equity for the year. Beginning capital \$96,000; no additional investment; net income \$43,400 (Lesson 4.1); withdrawals \$30,000.

Show solution

1. Heading: Greenleaf Hardware / Statement of Owner's Equity / For the Year Ended December 31, 20—.
2. T. Greene, Capital, January 1: \$96,000.
3. Add net income: \$43,400. Subtotal \$139,400.
4. Less withdrawals: \$30,000.
5. T. Greene, Capital, December 31: \$109,400.

Answer: Ending capital \$109,400, which goes to the balance sheet.

Example 2. A consultant began the year with capital of \$25,000, invested \$8,000 more in March, had a net loss of \$4,500, and withdrew \$12,000. Prepare the statement's calculation and comment.

Show solution

1. Beginning capital \$25,000 + investment \$8,000 = \$33,000.
2. Less net loss \$4,500 and withdrawals \$12,000 = \$16,500.
3. Ending capital = 33,000 – 16,500 = \$16,500.

Answer: Ending capital \$16,500. Equity fell by \$8,500 even though the owner put in \$8,000: she lost money and withdrew \$12,000.

Example 3. A partner's share of profit is half of each year's net income. Over three years, net income is \$9,000, \$11,000 and \$12,500; the partner withdraws \$5,000 each year; his beginning capital is \$20,000. What is his capital at the end of year 3?

Show solution

1. Shares of income: 4,500 + 5,500 + 6,250 = \$16,250.
2. Withdrawals: 3 × 5,000 = \$15,000.
3. Ending capital = 20,000 + 16,250 – 15,000 = \$21,250.

Answer: \$21,250.

PRACTICE

1. Easy Write the equation for ending capital.

Show answer

Beginning capital + investments + net income – withdrawals (– net loss) = ending capital.

2. Easy Which statement must be prepared before the statement of owner's equity? Which after?

Show answer

The income statement before; the balance sheet after.

3. **Easy** Beginning capital \$40,000; net income \$15,000; withdrawals \$9,000. Ending capital?

Show answer

\$46,000.

4. **Medium** Beginning capital \$12,000; investment \$3,000; net loss \$2,500; withdrawals \$4,000. Ending capital?

Show answer

\$8,500.

5. **Medium** Ending capital \$31,000; beginning \$27,000; withdrawals \$10,000; no investments. Net income?

Show answer

\$14,000.

6. **Medium** Why is an owner's investment not revenue?

Show answer

Revenue is earned from customers; an investment is the owner putting in his own assets, which increases his claim but was not earned.

7. **Medium** What arrangement did Franklin make with David Hall in 1748?

Show answer

Hall ran the printing shop and Franklin received half the profits for eighteen years (1748–1766), freeing Franklin for science and public service.

8. **Hard** Over a year, assets rose from \$80,000 to \$95,000 and liabilities from \$30,000 to \$38,000. The owner invested \$5,000 and withdrew \$18,000. Net income?

Show answer

Equity 50,000 → 57,000. $50,000 + 5,000 + \text{NI} - 18,000 = 57,000$; $\text{NI} = \$20,000$.

9. **Hard** An owner withdraws \$40,000 a year from a business earning \$30,000 a year. Beginning capital is \$50,000. What is capital after five years if nothing else changes, and what does it mean?

Show answer

$50,000 - 5 \times 10,000 = \$0$. The owner has consumed the whole equity; the business has no cushion and depends wholly on creditors.

10. **Hard** Explain what “articulation” means using Greenleaf’s statements.

Show answer

Net income of \$43,400 from the income statement flows into the statement of owner’s equity, whose ending capital of \$109,400 flows into the balance sheet.

11. **Challenge** Franklin’s “a small leak will sink a great ship.” Write a short paragraph applying it to owner withdrawals, with a numerical example.

Show answer

Sample: A shop earning \$24,000 a year whose owner takes \$26,000 loses \$2,000 of equity each year; over ten years \$20,000 of the cushion is gone, though no single year looked serious.

COMMON MISTAKES

- Recording owner investments as revenue.
- Subtracting a net loss twice, or adding it.
- Using ending capital from the trial balance (which is still beginning capital) on the balance sheet.

Make it a game • Owner's Equity Roll-Forward. Your parent names a beginning capital and, for five pretend years, announces net income or loss, an extra investment and owner withdrawals. After each year, you state the ending capital in ten seconds and show it feeds the next year. Finish by explaining how the statement connects the income statement to the balance sheet. Try to finish all five years error-free.

4.3 THE BALANCE SHEET: THE BANK OF ENGLAND REPORTS

OBJECTIVES

- Prepare a classified balance sheet with current assets, property, plant and equipment, current liabilities, long-term liabilities and owner's equity.
- Distinguish current from long-term items using the one-year rule.
- Compute working capital and the current ratio and explain what they show.

Warm-up. Make two quick lists: things your family owns that could become cash within a year (savings, things you could sell) and things that will last many years (a house, a car). Why might a lender care which list is longer?

WATCH

How to Prepare a Classified Balance Sheet

Edspira • 7:45

<https://www.youtube.com/watch?v=J8SZqn7MK6s>

WHEN TO WATCH

After the big idea, before the worked examples.

BACKUP VIDEO

The BALANCE SHEET for BEGINNERS (Full Example)

Accounting Stuff • 6:58

<https://www.youtube.com/watch?v=CMv1zIZhb4Q>

Before the practice set.

KEY TERMS

balance sheet

The report of a business's assets, liabilities and owner's equity at one moment in time. Also called the statement of financial position.

current assets

Cash and assets expected to become cash or be used up within one year (or the operating cycle): receivables, inventory, prepaid expenses, supplies.

property, plant and equipment

Long-lived tangible assets used in the business: land, buildings, equipment, shown at cost less accumulated depreciation (land is not depreciated).

current liabilities

Debts due within one year: accounts payable, wages and interest payable, unearned revenue, and the current portion of long-term debt.

long-term liabilities

Debts due after more than one year, such as mortgages and long-term notes and bonds.

working capital

Current assets minus current liabilities: the cushion available to pay short-term debts.

CORE IDEAS

The story. The Bank of England was founded in 1694 to lend money to the government of King William III. For more than a century it published very little about its own affairs. In 1797, fearing invasion, the bank suspended the payment of gold for its notes, and members of Parliament demanded to know whether it was sound. The bank had to lay its accounts before a committee of the House of Commons, which reported its assets and liabilities. From 1844, under the Bank Charter Act, the Bank of England published a weekly statement of its accounts, divided into an Issue Department and a Banking Department, and the weekly “Bank Return” became one of the most closely watched numbers in the world.

How they figured it out. A bank’s safety depends less on how much it owns than on whether it can meet the demands that will come soon. A bank whose assets are long-term loans but whose liabilities are deposits that can be withdrawn tomorrow can fail even if it is “rich.” So readers of balance sheets learned to ask not just “how much?” but “how soon?” The **classified balance sheet** answers by sorting assets and liabilities into current (within one year) and long-term.

The big idea. The balance sheet is a snapshot *at a date* (“December 31, 20—,” not “for the year”). Assets are listed in order of liquidity: **current assets** (cash, receivables, inventory, prepaid items, supplies), then **property, plant and equipment** at book value, then other long-term assets. Liabilities are split into **current** (due within a year, including the part of long-term debt due next year) and **long-term**. Owner’s equity comes from the statement of owner’s equity. Total assets must equal total liabilities plus equity. Two quick measures: **working capital** = current assets – current liabilities, and the **current ratio** = current assets ÷ current liabilities.

In business today. Bankers read the current section first: a current ratio well above 1 suggests a business can pay its bills, while one below 1 is a warning. Investors look at the debt (long-term liabilities) compared with equity. Central banks, including the Federal Reserve, still publish weekly statements of their balance sheets, a tradition that goes back to the Bank of England's weekly return.

Think it through. A balance sheet shows assets at cost less depreciation, not at what they would sell for today. Land bought decades ago may be worth far more than its book value; a specialized machine may be worth far less. Read a balance sheet as a careful record of what was paid and what is owed, not as a price tag on the business.

PICTURE STUDY



The Great Hall, Bank of England, Thomas Rowlandson and Augustus Charles Pugin, from *The Microcosm of London*, 1808 · Hand-colored aquatint · Metropolitan Museum of Art, New York

Image: [Wikimedia Commons](#), public domain

The Microcosm of London (1808–1810) showed the city's great buildings full of people. Here customers and clerks do business in the Bank of England's great hall, where dividends on government debt were paid and accounts kept.

Look closely

- Find the counters and the central enclosure. Who might work behind them?
- Find the customers. What are they wearing?
- Find the statue in its niche.
- Look at the size of the hall. What impression did the bank want to give?

Talk about it

1. Why would people who deposited money or held the bank's notes want to see its balance sheet?
2. What would the clerks in this hall have recorded as the bank's assets and liabilities?
3. Why does a grand building not prove that a bank is sound?

PROJECT

A Classified Balance Sheet from Real Records

You will prepare a classified balance sheet for a household, club or small business (with a parent's permission) or for the sample business, and analyze it.

You will need

- Real records with a parent's permission, or the Greenleaf data
- Ledger notebook or spreadsheet

Steps

1. Choose a household, club, church ministry or small business, with a parent's help. Use rounded or approximate numbers if exact ones are private.
2. List every asset and liability with its value at one date. For long-lived items, use cost less an estimate of depreciation.
3. Classify each item as current asset, long-term asset, current liability or long-term liability. Split any loan into the part due within a year and the rest.
4. Compute equity as assets – liabilities.
5. Prepare the classified balance sheet with a proper three-line heading.
6. Compute working capital and the current ratio.
7. Write a paragraph a banker might write after reading it: strengths, weaknesses, and one question you would ask.
8. If you used real records, keep the page at home and black out anything private.

Tips

- For a household, a house or car counts as a long-term asset and its loan as a mostly long-term liability.
- Do not include anything you hope to own; include only what is owned on the date.

Check your work

- ☐ My balance sheet is classified and balanced.
- ☐ I computed working capital and the current ratio correctly.

- My banker's paragraph refers to specific numbers.

LEDGER NOTEBOOK

1. Draw the balance sheet as a two-column page with each section labeled.
2. Copy Greenleaf's balance sheet and circle the current sections.
3. Explain in two sentences why the Bank of England's weekly return mattered.

KEY FORMULAS

Total assets = Total liabilities + Owner's equity

Working capital = Current assets – Current liabilities

Current ratio = $\frac{\text{Current assets}}{\text{Current liabilities}}$

From history. From 1844 the Bank of England's weekly return was printed in *The Economist* and the London newspapers, and merchants around the world read it to judge whether credit would be easy or tight in the weeks ahead.

WORKED EXAMPLES

Example 1. Prepare Greenleaf Hardware's classified balance sheet at December 31 (balances from Lesson 4.1; ending capital \$109,400 from Lesson 4.2).

Show solution

1. Heading: Greenleaf Hardware / Balance Sheet / December 31, 20—.
2. Current assets: Cash 19,800; Accounts Receivable 9,600; Merchandise Inventory 32,500; Prepaid Insurance 1,800; Supplies 700. Total \$64,400.
3. Property, plant and equipment: Land 25,000; Building 120,000 – 36,000 = 84,000; Equipment 30,000 – 12,000 = 18,000. Total \$127,000.
4. Total assets: 64,400 + 127,000 = \$191,400.
5. Current liabilities: Accounts Payable 14,200; Wages Payable 1,300; Interest Payable 600; Unearned Revenue 900; Notes Payable, current portion 5,000. Total \$22,000.
6. Long-term liabilities: Notes Payable 60,000. Total liabilities \$82,000.
7. Owner's equity: T. Greene, Capital \$109,400.
8. Total liabilities and owner's equity: 82,000 + 109,400 = \$191,400.

Answer: Total assets \$191,400 = total liabilities and equity \$191,400.

Example 2. Compute Greenleaf’s working capital and current ratio, and interpret them.

Show solution

1. Working capital = $64,400 - 22,000 = \$42,400$.
2. Current ratio = $64,400 / 22,000 \approx 2.93$.
3. Greenleaf has nearly \$3 of current assets for every \$1 due within a year, a comfortable cushion, though half of its current assets are inventory, which must be sold before it becomes cash.

Answer: Working capital \$42,400; current ratio about 2.93.

Example 3. Classify each as current asset, PP&E, current liability or long-term liability: a 5-year bank loan with \$4,000 due next year and \$16,000 after that; customer deposits for next month’s orders; a delivery truck; insurance paid for the next 6 months.

Show solution

1. Bank loan: current liability \$4,000 (current portion) and long-term liability \$16,000.
2. Customer deposits: unearned revenue, a current liability.
3. Delivery truck: property, plant and equipment.
4. Six months of prepaid insurance: current asset.

Answer: Split the loan; deposits are current liabilities; the truck is PP&E; prepaid insurance is a current asset.

PRACTICE

1. Easy How is the balance sheet’s date written differently from the income statement’s?

Show answer

It is at a single date (“December 31, 20—”), not for a period.

2. Easy In what order are current assets listed?

Show answer

Order of liquidity: cash, receivables, inventory, prepaid items, supplies.

3. Easy What is the one-year rule?

Show answer

Assets expected to become cash or be used within a year, and debts due within a year, are current; others are long-term.

4. Medium Current assets \$48,000; current liabilities \$30,000. Working capital and current ratio?

Show answer

\$18,000; 1.6.

5. Medium Equipment \$45,000; accumulated depreciation \$18,500. Book value?

Show answer

\$26,500.

6. Medium A \$50,000 mortgage requires \$3,500 of principal payments next year. How is it shown?

Show answer

Current liabilities \$3,500; long-term liabilities \$46,500.

7. Medium Why did Parliament demand the Bank of England's accounts in 1797?

Show answer

The bank had suspended gold payments for its notes during a war scare, and Parliament wanted to know whether it was sound.

8. Hard Total assets \$300,000; current assets \$90,000; current liabilities \$60,000; long-term liabilities \$110,000. Find equity, working capital and the current ratio.

Show answer

Equity \$130,000; working capital \$30,000; current ratio 1.5.

9. Hard A business with a current ratio of 0.8 is profitable. Why might a banker still worry?

Show answer

It has less in current assets than it owes within a year; it may be unable to pay its bills on time even though it earns a profit.

10. **Hard** Prepare a classified balance sheet total from: Cash 5,200; A/R 3,800; Supplies 600; Equipment 22,000; Accumulated Depreciation 6,000; A/P 2,900; Wages Payable 500; Notes Payable (due in 3 years) 9,000; Capital ?

Show answer

Current assets 9,600; PP&E 16,000; total assets 25,600. Current liabilities 3,400; long-term 9,000; capital = $25,600 - 12,400 = \$13,200$.

11. **Challenge** Greenleaf's land was bought for \$25,000 twenty years ago and could sell for \$90,000 today. Should the balance sheet show \$90,000? Discuss using the cost principle.

Show answer

No; under the cost principle it stays at \$25,000. The higher value is an estimate, not a transaction. Notes to the statements or an appraisal can inform readers, but the books record what was paid.

COMMON MISTAKES

- Leaving the current portion of a long-term debt in long-term liabilities.
- Showing equipment at cost without subtracting accumulated depreciation.
- Using beginning capital instead of ending capital.

Make it a game • Current or Long-Term Rapid Fire. Your parent reads quick items: a loan due in eight months, a delivery van, a two-year note, supplies on hand, a patent. You classify each as a current asset, property plant and equipment, a current liability or a long-term liability using the one-year rule. Then compute working capital for a small balance sheet. Ten items in sixty seconds is your target.

4.4 THE STATEMENT OF CASH FLOWS: PROFITABLE AND BROKE

OBJECTIVES

- Explain why a profitable business can run out of cash.
- Classify cash flows as operating, investing or financing.
- Prepare a statement of cash flows using the indirect method from comparative balance sheets and an income statement.

Warm-up. A friend's lawn business earned a \$1,200 profit this summer, but she has only \$150 in the bank. List three ways that could happen without anything dishonest.

WATCH

The CASH FLOW STATEMENT for BEGINNERS

Accounting Stuff • 15:10

<https://www.youtube.com/watch?v=DiVPAjgmj0>

WHEN TO WATCH

After the big idea; pause at each section and classify the items yourself first.

BACKUP VIDEO

Statement of Cash Flows (Indirect Method)

Edspira • 8:27

<https://www.youtube.com/watch?v=WZCXyYGI0fk>

Before Worked Example 2, for the indirect method step by step.

KEY TERMS

statement of cash flows

The report of cash received and paid during a period, grouped into operating, investing and financing activities, ending with the change in cash.

operating activities

Cash effects of the business's main operations: cash from customers, cash paid to suppliers and workers, interest and taxes paid.

investing activities

Buying and selling long-term assets (equipment, buildings, land) and investments.

financing activities

Cash from or to owners and lenders: owner investments and withdrawals, borrowing and repaying loans.

indirect method

A way of computing operating cash flow by starting with net income and adjusting for non-cash expenses (depreciation) and changes in current assets and liabilities.

CORE IDEAS

The story. In the summer of 1931, crowds gathered outside banks across the United States, among them the American Union Bank in New York, as depositors rushed to take out their money. Many of these banks were not losing money on paper; their loans and bonds might have been repaid in time. But their cash was tied up, and when depositors demanded it all at once, they could not pay and had to close. Ordinary businesses can fail the same way. A company that sells on credit, builds up inventory and buys new equipment can show a profit every month and still be unable to meet its payroll.

How they figured it out. For most of the twentieth century, companies reported a “statement of changes in financial position” that mixed cash with other measures. After several well-known firms with healthy-looking profits ran out of cash in the 1970s, investors and lenders asked for a statement focused on cash alone. In 1987 the Financial Accounting Standards Board required the **statement of cash flows** as one of the basic statements under U.S. GAAP.

The big idea. Cash flows fall into three groups. **Operating:** cash from customers and cash paid for the costs of doing business. **Investing:** buying or selling long-term assets. **Financing:** borrowing and repaying, and owner investments and withdrawals. Most companies use the **indirect method** for the operating section: start with net income, add back depreciation (an expense that used no cash this period), subtract increases in current assets such as receivables and inventory (cash tied up), and add increases in current liabilities such as payables (cash not yet paid

out). The three sections add to the change in cash, which must match the change on the balance sheets.

In business today. Bankers and investors often read the cash-flow statement first, because cash is harder to disguise than profit. A company with rising net income but falling operating cash flow may be booking sales it has not collected. Small-business owners learn the lesson the hard way: growth eats cash, because more sales mean more inventory and more receivables before the customers pay.

Think it through. Joseph stored grain in the seven years of plenty so that Egypt could eat in the seven years of famine (Genesis 41). Profit is like a good harvest; cash is the grain in the storehouse when it is needed.

PICTURE STUDY



A Crowd at the American Union Bank, Unknown photographer, 1931 · Photograph · New York

Image: [Wikimedia Commons](#), public domain

In 1931, during the Great Depression, depositors crowded the doors of the American Union Bank in New York to withdraw their money. Scenes like this were repeated across the country until deposit insurance (the FDIC) began in 1934.

Look closely

- Look at the crowd. How many people can you estimate?
- Find the bank's sign and its doors.
- Look at people's faces and posture. What are they feeling?
- Look for police or bank officers.

Talk about it

1. What does each person in the crowd want from the bank, and why can the bank not give it to everyone at once?
2. How is this crowd like a business's creditors all asking to be paid in the same week?
3. Which section of the statement of cash flows would show the bank's trouble most clearly?

PROJECT

A Cash-Flow Statement and a Cash Budget

You will prepare a statement of cash flows from comparative balance sheets, then look ahead with a simple three-month cash plan.

You will need

- Spreadsheet software
- Your Hope Valley Pet Care books from Lesson 3.5 (August and September)

Steps

1. Use Hope Valley's August 31 and September 30 balance sheets (from your Lesson 3.5 practice set) and September's income statement.
2. Compute operating cash flow by the indirect method: net income, plus depreciation, minus increases in current assets, plus increases in current liabilities.
3. List investing and financing cash flows for September (the note repayment and Ruth's withdrawal).
4. Prepare the statement of cash flows with a proper heading and prove the change in cash (\$2,770 → \$2,620, a decrease of \$150).
5. Then plan ahead: in a spreadsheet, list expected cash receipts and payments for October, November and December, using September as a guide. Include a planned \$1,200 equipment purchase in November.
6. Find the expected cash balance at the end of each month. If it ever falls below \$500, write what Ruth could do (delay the purchase, collect faster, borrow, withdraw less).
7. Write a paragraph explaining the difference between September's net income and September's change in cash.

Tips

- Watch the signs: an increase in an asset uses cash; an increase in a liability provides cash.
- Payment of last month's wages payable is part of the decrease in Wages Payable, an operating item.

Check your work

- ☐ My September operating cash flow is \$1,150: net income 1,485 + depreciation 100 – increase in receivables 200 + decrease in supplies 30 + decrease in prepaid insurance 75 – decrease in unearned revenue 300 – decrease in wages payable 30 – decrease in interest payable 10.
- ☐ Investing \$0; financing $-500 - 800 = -\$1,300$; net change $-\$150$.
- ☐ My three-month plan shows a cash balance for each month and a response to any shortfall.

LEDGER NOTEBOOK

1. Draw three buckets labeled Operating, Investing and Financing, with arrows into and out of a Cash tank.
2. Copy Greenleaf's statement of cash flows.
3. Write two reasons a profitable business can run out of cash.

KEY FORMULAS

Net change in cash = $CF_{\text{operating}} + CF_{\text{investing}} + CF_{\text{financing}}$

$CF_{\text{op}} = NI + \text{Depreciation} - \Delta(\text{current assets}) + \Delta(\text{current liabilities})$

From history. Deposit insurance through the Federal Deposit Insurance Corporation (FDIC) began on January 1, 1934, under the Banking Act of 1933. Bank runs like the one in the picture became rare in the United States afterward.

WORKED EXAMPLES

Example 1. Classify each cash flow: (a) cash received from customers; (b) purchase of a delivery van for cash; (c) owner's withdrawal; (d) wages paid; (e) repayment of a bank loan's principal; (f) interest paid on the loan; (g) sale of old equipment for cash.

Show solution

1. (a) operating; (d) operating; (f) operating (under U.S. GAAP interest paid is operating).
2. (b) investing; (g) investing.
3. (c) financing; (e) financing.

Answer: Operating: a, d, f. Investing: b, g. Financing: c, e.

Example 2. Greenleaf Hardware's balance sheets show (last year → this year): Cash 12,400 → 19,800; Accounts Receivable 8,100 → 9,600; Inventory 29,000 → 32,500; Prepaid Insurance 1,500 → 1,800; Supplies 900 → 700; Accounts Payable 12,900 → 14,200; Wages Payable 1,100 → 1,300; Interest Payable 700 → 600; Unearned Revenue 1,200 → 900. Net income was \$43,400 and depreciation \$9,000. Compute cash flow from operating activities by the indirect method.

Show solution

1. Start with net income: \$43,400. Add depreciation: +\$9,000.
2. Increase in receivables (cash tied up): -1,500. Increase in inventory: -3,500. Increase in prepaid insurance: -300. Decrease in supplies: +200.
3. Increase in accounts payable: +1,300. Increase in wages payable: +200. Decrease in interest payable: -100. Decrease in unearned revenue: -300.
4. Total: $43,400 + 9,000 - 1,500 - 3,500 - 300 + 200 + 1,300 + 200 - 100 - 300 = \$48,400$.

Answer: Cash provided by operating activities: \$48,400.

Example 3. Complete Greenleaf's statement of cash flows. During the year it bought equipment for \$6,000 cash (Equipment 24,000 → 30,000), repaid \$5,000 of notes payable (total notes 70,000 → 65,000), and Thomas Greene withdrew \$30,000. Prove the change in cash.

Show solution

1. Operating activities: +\$48,400.
2. Investing activities: purchase of equipment -\$6,000.
3. Financing activities: repayment of notes -5,000; owner withdrawals -30,000; total -\$35,000.
4. Net increase in cash: $48,400 - 6,000 - 35,000 = \$7,400$.
5. Check: cash rose from \$12,400 to \$19,800, an increase of \$7,400.

Answer: Net increase in cash \$7,400, matching the balance sheets.

PRACTICE

1. **Easy** Name the three sections of the statement of cash flows.

Show answer

Operating, investing, financing.

2. **Easy** Why is depreciation added back in the indirect method?

Show answer

It is an expense that reduced net income but used no cash this period.

3. **Easy** When did the FASB require the statement of cash flows?

Show answer

1987.

4. **Medium** Classify: buying land; borrowing on a note; paying suppliers; owner investing cash.

Show answer

Investing; financing; operating; financing.

5. **Medium** Net income \$20,000; depreciation \$4,000; A/R increased \$3,000; A/P increased \$1,500. Operating cash flow?

Show answer

\$22,500.

6. **Medium** Net income \$15,000; inventory increased \$9,000; wages payable decreased \$800; depreciation \$2,500. Operating cash flow?

Show answer

\$7,700.

7. **Medium** Explain why an increase in accounts receivable is subtracted.

Show answer

Some revenue included in net income has not yet been collected in cash.

8. **Hard** Operating CF \$31,000; bought equipment \$18,000; sold old truck \$4,000; borrowed \$10,000; owner withdrew \$22,000. Beginning cash \$9,000. Ending cash?

Show answer

Investing -14,000; financing -12,000; change +5,000; ending cash \$14,000.

9. **Hard** Why did many banks close in 1931 even though their loans had not all gone bad?

Show answer

Their assets were tied up in loans and bonds that could not quickly become cash, and when depositors withdrew at once the banks could not pay.

10. **Hard** A fast-growing company reports rising net income but negative operating cash flow for three years. Give two possible explanations, one innocent and one worrying.

Show answer

Innocent: rapid growth ties up cash in receivables and inventory. Worrying: revenue is being recorded that customers are not paying (or may never pay).

11. **Challenge** Using the Greenleaf data, compute cash received from customers (direct method), given sales of \$310,000, the change in receivables and the change in unearned revenue.

Show answer

Collections = 310,000 – 1,500 (A/R increase) – 300 (unearned decrease) = \$308,200.

COMMON MISTAKES

- Adding increases in current assets instead of subtracting them.
- Putting owner withdrawals in operating activities.
- Forgetting to prove the net change against the balance sheets.

Make it a game • Profitable and Broke Riddles. Your parent poses riddles of a profitable business that has run out of cash: sales on credit, inventory piling up, equipment bought, a loan repaid. For each, say whether the cash flow is operating, investing or financing and whether cash rises or falls. Then explain the original riddle in one minute. Switch and write three of your own.

Scripture. “Go to the ant, thou sluggard; consider her ways, and be wise: Which having no guide, overseer, or ruler, Provideth her meat in the summer, and gathereth her food in the harvest.” (Proverbs 6:6-8, KJV)

The ant stores food in summer for the winter ahead. A wise business watches not only its profit but its cash, and plans for the months when cash runs short.

4.5 READING A REAL ANNUAL REPORT: U.S. STEEL TO THE 10-K

OBJECTIVES

- Describe the parts of a public company's annual report and Form 10-K: the auditor's report, the four statements, the notes, and management's discussion.
- Tell how U.S. Steel's report for 1902 and the securities laws of 1933–34 shaped modern corporate reporting.
- Read and interpret key figures from a real annual report and write a stakeholder report.

Warm-up. If you were deciding whether to lend \$1,000 to a company you had never visited, what five questions would you want its report to answer? Write them, then see how many a real annual report answers.

WATCH

How to read a 10-K annual report

The Finance Storyteller • 8:19

https://www.youtube.com/watch?v=qM2_RlUb3jc

WHEN TO WATCH

After the core ideas and before you open a real report.

BACKUP VIDEO

FINANCIAL STATEMENTS: all the basics in 8 MINS!

Accounting Stuff • 9:05

<https://www.youtube.com/watch?v=Fi1wkUczuyk>

Before the project, as a quick review of the four statements you will look for in the report.

KEY TERMS

annual report

A company's yearly report to its owners, with its financial statements, notes, the auditor's opinion and management's discussion.

Form 10-K

The detailed annual report that U.S. public companies must file with the Securities and Exchange Commission; it is free to read on the SEC's EDGAR website.

notes to the financial statements

Explanations that accompany the statements: accounting methods, details of debt, leases, commitments and other information needed to understand the numbers.

auditor's report

The independent accountant's opinion on whether the statements are presented fairly in accordance with GAAP.

MD&A

Management's Discussion and Analysis: management's explanation of the results, trends, risks and plans.

CORE IDEAS

The story. In 1901 J. P. Morgan and others merged Andrew Carnegie's steel company with several rivals to form the United States Steel Corporation, the first American company valued at more than a billion dollars. Thousands of investors bought its shares, and most of them would never see a mill. For its first annual report, covering 1902, the corporation hired the accounting firm Price, Waterhouse & Co. to audit its accounts and published detailed, consolidated statements of the whole company, with the auditors' certificate. At a time when many companies told their shareholders almost nothing, U.S. Steel's report was hailed as a model of disclosure.

How they figured it out. Voluntary reports like U.S. Steel's were the exception. After the crash of 1929, Congress held hearings that showed how little investors had been told. The Securities Act of 1933 required companies selling new stock to the public to give investors a prospectus with audited financial statements, and the Securities Exchange Act of 1934 required companies whose shares traded on exchanges to file annual reports and created the Securities and Exchange Commission to enforce the rules. The annual report on Form 10-K, filed with the SEC, grew from those laws.

The big idea. A 10-K contains: a description of the business and its risks; **Management's Discussion and Analysis**; the four financial statements, usually for two or three years side by side; the **notes**, which are often longer than the statements; and the **auditor's report**. Read it in this order: the business description (what does the company do?), the income statement (is it profitable, and growing?), the balance sheet (what does it own and owe?), the cash-flow statement (does profit

turn into cash?), then the notes and MD&A for the explanations. Compare each number with the year before.

In business today. Every company whose shares are publicly traded in the United States files its 10-K on the SEC's free EDGAR system, and most also post a friendlier annual report on their websites. The six stakeholders all read them: lenders and shareholders (financiers and risk-takers), managers (builders), employees deciding whether to join or stay (workers), large customers choosing long-term suppliers, and communities watching a major employer. Learning to read one is a lifelong skill.

Try it. In the project you will choose a well-known company with a parent, download its annual report, and write a stakeholder report from it. You are studying the company, not choosing an investment.

PICTURE STUDY



A Bessemer Steel Converter, Pittsburgh, Detroit Publishing Company, about 1908 · Photograph (postcard print) · New York Public Library
Image: [Wikimedia Commons](#), public domain

Converters like this one made the steel of Carnegie's mills, which became part of the United States Steel Corporation in 1901. Investors who owned shares of U.S. Steel relied on its annual reports to know what such mills earned.

Look closely

- Find the converter and the shower of sparks.
- Look for the mill building's girders and roof.
- Look for workers. Where do they stand?
- Notice the light. Where does it come from?

Talk about it

1. How would a shareholder in London or New York know what a mill like this earned?
2. Which stakeholders depended on honest reports from U.S. Steel?
3. On which financial statement, and in which section, would this equipment appear?

PROJECT

A Stakeholder Report from a Real Annual Report

You will read a real public company's annual report and write a stakeholder report from it. This is a study of a company, not an investment decision.

You will need

- Internet access with a parent
- The SEC's EDGAR site or the company's investor-relations page
- Spreadsheet

Steps

1. With a parent, choose a well-known public company whose products you know (a grocery chain, a railroad, a toy or tool maker, a utility). Choose a company whose products a family would be glad to use.
2. Download its most recent annual report or Form 10-K from the company's website or from EDGAR. Do not create any accounts or enter personal information.
3. Read the business description and write three sentences on what the company does and how it earns money.
4. Copy into a spreadsheet, for the latest two years: revenue, gross profit (if shown), operating income, net income, total assets, total liabilities, equity, and cash from operations.
5. Compute the percent change for each, the net margin, and the current ratio.
6. Read the auditor's report: who is the auditor, and is the opinion "unqualified" (clean)?
7. Read one note and one section of MD&A and summarize each in a paragraph.
8. Write a one-to-two page stakeholder report with a 1–5 scorecard and reasons for each of the six stakeholders, saying clearly where the report gave no evidence.
9. End with three questions you would ask management if you could.

Tips

- Large reports are long; use the table of contents and search for “Consolidated Statements of Operations” and “Balance Sheets.”
- Numbers are often in thousands or millions; check the heading of each statement.

Check your work

- ☐ My spreadsheet shows two years of key figures and the percent changes, correctly computed.
- ☐ My stakeholder scorecard gives a reason for every rating and admits where evidence is missing.
- ☐ I can explain what the auditor’s opinion says.

LEDGER NOTEBOOK

1. Draw the table of contents of a 10-K as a map with the four statements marked.
2. Make a timeline: 1902 U.S. Steel’s audited report; 1929 crash; 1933 Securities Act; 1934 Exchange Act and SEC; 1973 FASB; today, EDGAR.
3. Copy your stakeholder scorecard.

KEY FORMULAS

$$\text{Percent change} = \frac{\text{This year} - \text{Last year}}{\text{Last year}} \times 100\%$$

From history. Price, Waterhouse & Co. began in London in 1849. Its American office, opened in 1890, audited many of the large companies of the early 1900s, and its auditors’ certificate on U.S. Steel’s reports helped build the reputation of independent audits in the United States.

WORKED EXAMPLES

Example 1. A company's 10-K reports (in millions): revenue 4,820 this year and 4,500 last year; net income 386 and 405; cash from operations 512 and 470. Compute the percent change in each and interpret.

Show solution

1. Revenue: $(4,820 - 4,500)/4,500 = 320/4,500 \approx 7.1\%$.
2. Net income: $(386 - 405)/405 = -19/405 \approx -4.7\%$.
3. Cash from operations: $(512 - 470)/470 = 42/470 \approx 8.9\%$.
4. Sales and operating cash grew, but net income fell. Look in MD&A and the notes for why (higher costs, a one-time charge, higher interest).

Answer: Revenue +7.1%, net income -4.7%, operating cash flow +8.9%; investigate the fall in net income.

Example 2. Using Greenleaf Hardware's statements, write a short stakeholder scorecard (1–5) with a reason for each group.

Show solution

1. Financiers: 4. Current ratio about 2.9; long-term debt \$60,000 against equity of \$109,400; interest covered about ten times by operating income ($48,200 \div 4,800$).
2. Risk-takers (owner): 4. Net income \$43,400, a 14% net margin; equity grew \$13,400 during the year.
3. Builders (managers): 4. A 40% gross margin and \$48,400 of operating cash flow give room to improve the store.
4. Workers: 3. Wages of \$52,000 were paid and \$1,300 more is owed; the statements alone say nothing of pay rates or conditions.
5. Customers: 3. Unearned revenue of \$900 shows customer deposits are owed goods; the statements do not show quality or service.
6. Community: 3. The statements show a stable local business but say nothing about taxes, local hiring or charity; ask the owner.

Answer: A sample scorecard; statements answer some stakeholder questions well and others not at all.

Example 3. A note to a company's statements says: "Inventory is stated at the lower of cost (first-in, first-out) or net realizable value." Another says: "The company is a defendant in lawsuits; management believes the outcome will not be material." What does each tell a reader?

Show solution

1. The first tells which inventory method is used (FIFO, Lesson 6.4) and that inventory is written down if it is worth less than cost, so figures can be compared with other companies'.
2. The second warns of a possible future liability that is not on the balance sheet; a careful reader notes it and watches next year's report.

Answer: Notes explain the methods behind the numbers and disclose risks the numbers alone cannot show.

PRACTICE

1. **Easy** What is Form 10-K and where can anyone read one for free?

Show answer

The annual report U.S. public companies file with the SEC; on the SEC's EDGAR website.

2. **Easy** Which two laws created the modern U.S. reporting system, and what agency did the second create?

Show answer

The Securities Act of 1933 and the Securities Exchange Act of 1934; the SEC.

3. **Easy** Who audited U.S. Steel's first annual report, for 1902?

Show answer

Price, Waterhouse & Co.

4. **Medium** Revenue rose from \$820 million to \$902 million. Percent change?

Show answer

$82 \div 820 = 10\%$.

5. **Medium** Net income fell from \$64 million to \$48 million. Percent change?

Show answer

$$-16 \div 64 = -25\%.$$

6. **Medium** Why are the notes to the statements important?

Show answer

They explain accounting methods and give details and risks (debt terms, leases, lawsuits, commitments) needed to understand the numbers.

7. **Medium** In what order does the lesson suggest reading a 10-K, and why start with the business description?

Show answer

Business description, income statement, balance sheet, cash flows, then notes and MD&A; the numbers make sense only when you know what the company does.

8. **Hard** A company's net income grew 20% but cash from operations fell 15%, and receivables doubled. What would you look for in the notes and MD&A?

Show answer

Revenue recognition policies, credit terms, any change in customers or collection problems, and the allowance for doubtful accounts.

9. **Hard** Why was U.S. Steel's 1902 report considered a model, and why were voluntary reports not enough?

Show answer

It gave audited, consolidated, detailed statements when most firms disclosed little; but many companies did not follow its example, and the 1929 crash showed investors needed required, audited disclosure.

10. **Hard** Which stakeholder questions can financial statements answer well, and which can they not answer? Give two of each.

Show answer

Well: ability to repay debt; profitability. Poorly: treatment and safety of workers; product quality and honesty with customers (these need other sources).

11. **Challenge** Operating income was \$1,200 million and interest expense \$150 million this year; last year \$1,050 and \$210 million. Compute interest coverage both years and interpret.

Show answer

This year 8.0 times; last year 5.0 times. The company can pay its interest much more comfortably than before.

COMMON MISTAKES

- Reading only the income statement and ignoring cash flows and the notes.
- Missing that figures are in thousands or millions.
- Treating a study of a company as a recommendation to buy its stock.

Make it a game • Annual Report Press Conference. You are the chief financial officer facing reporters. Your parent asks a question about each part of an annual report: the auditor's report, four financial statements, the notes and management's discussion. Answer each in twenty seconds. Add what the 1902 U.S. Steel report and the securities laws of 1933 to 1934 changed. A rattled answer costs a point.

FINANCIAL STATEMENTS

Financial statements are where all the bookkeeping becomes useful. In this unit you will prepare the four basic statements, each with a story of the people who needed it: Josiah Wedgwood's search in 1772 for which of his wares really earned money (the income statement); Benjamin Franklin's profit-sharing partnership with David Hall (the statement of owner's equity); the Bank of England, forced to lay its accounts before Parliament and later publishing them every week (the balance sheet); and the bank runs of 1931, which showed that a business can be profitable and still run out of cash (the statement of cash flows).

You will prepare all four for a hardware store, see how they fit together, and then read a real public company's annual report, following a tradition that runs from U.S. Steel's audited report for 1902 through the securities laws of 1933 and 1934 to today's Form 10-K. You will judge what the statements tell each of the six stakeholders, and what they cannot tell.

PREREQUISITES

- The full accounting cycle (Unit 3)
- Percents and percent change
- Spreadsheet formulas

MASTERY CHECKLIST

- ☐ I can prepare single-step and multi-step income statements and compute margins.
- ☐ I can prepare a statement of owner's equity and explain how the statements articulate.
- ☐ I can prepare a classified balance sheet and compute working capital and the current ratio.
- ☐ I can prepare a statement of cash flows by the indirect method and explain why profit and cash differ.
- ☐ I can find and interpret the key figures, notes and auditor's opinion in a real annual report, and write a stakeholder report.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **SEC EDGAR (search “EDGAR” at sec.gov):** Free. Every U.S. public company’s 10-K and annual report, searchable by company name. No account is needed. Use with a parent for the Lesson 4.5 project.
- **Investor.gov (U.S. Securities and Exchange Commission):** Free investor-education site from the SEC, including a plain-English guide to reading financial statements. Ages 15 and up.
- **The Way to Wealth, by Benjamin Franklin (1758):** Free on Project Gutenberg. Franklin’s collected sayings on industry and thrift, from *Poor Richard’s Almanack*. Read it with Lesson 4.2.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

4.1 The Income Statement: Wedgwood Finds His Costs	3 sessions of 50 minutes
4.2 The Statement of Owner’s Equity: Franklin and Hall	3 sessions of 50 minutes
4.3 The Balance Sheet: The Bank of England Reports	3 sessions of 50 minutes
4.4 The Statement of Cash Flows: Profitable and Broke	3 sessions of 50 minutes
4.5 Reading a Real Annual Report: U.S. Steel to the 10-K	3 sessions of 50 minutes

UNIT 4 TEST

Calculators are allowed. Show your work. Statements must have proper three-line headings. Answer concept questions and the essay in complete sentences. The test is worth 100 points.

1. **4 pts**

Name the four basic financial statements and say which is at a point in time.

2. **8 pts**

From these balances prepare a multi-step income statement: Sales \$180,000; COGS \$112,000; Wages \$34,000; Rent \$9,600; Utilities \$2,900; Depreciation \$3,500; Interest expense \$1,800.

3. **4 pts**

Compute the gross margin and net margin for Problem 2.

4. **6 pts**

Beginning capital \$52,000; additional investment \$6,000; net income \$16,200; withdrawals \$20,000. Prepare the statement of owner's equity calculation.

5. **10 pts**

Prepare a classified balance sheet and prove it: Cash 7,400; Accounts Receivable 6,100; Inventory 18,500; Prepaid Rent 1,200; Equipment 40,000; Accumulated Depreciation 14,000; Accounts Payable 8,300; Wages Payable 900; Note Payable 20,000 (\$4,000 due next year); Owner's Capital 30,000.

6. **4 pts**

Compute working capital and the current ratio for Problem 5.

7. **6 pts**

Classify as operating, investing or financing: sale of land; payment of wages; borrowing from a bank; owner withdrawal; purchase of a computer; collections from customers.

8. **8 pts**

Net income \$30,000; depreciation \$6,000; A/R increased \$4,500; inventory decreased \$2,000; A/P decreased \$1,500; wages payable increased \$700. Compute operating cash flow.

9. **6 pts**

With Problem 8's operating cash flow, the company bought equipment for \$25,000, borrowed \$10,000 and the owner withdrew \$15,000. Beginning cash \$8,000. Ending cash?

10. (5 pts)

What did Wedgwood learn about fixed costs in 1772, and how did he use it?

11. (5 pts)

Explain “articulation” of the statements.

12. (5 pts)

Why can a profitable business run out of cash? Give two reasons.

13. (5 pts)

What did the Securities Acts of 1933 and 1934 require, and what is Form 10-K?

14. (4 pts)

Revenue rose from \$2.40 billion to \$2.64 billion. Percent change?

15. (5 pts)

What does an auditor’s report say, and why does it matter to a lender?

16. (15 pts)

Essay: Choose four of the six stakeholders. For each, name the statement and one specific figure or ratio that would matter most to that group, and one important question the statements cannot answer for them.

ANSWER KEY

1. Income statement, statement of owner's equity, balance sheet, statement of cash flows; the balance sheet is at a point in time.
2. Gross profit 68,000; operating expenses 50,000; operating income 18,000; net income 16,200.
3. $68,000 \div 180,000 \approx 37.8\%$; $16,200 \div 180,000 = 9\%$.
4. $52,000 + 6,000 + 16,200 - 20,000 = \$54,200$.
5. Current assets 33,200; PP&E $40,000 - 14,000 = 26,000$; total assets 59,200. Current liabilities $8,300 + 900 + 4,000 = 13,200$; long-term liabilities 16,000; total liabilities 29,200; capital 30,000; total 59,200.
6. Working capital $33,200 - 13,200 = \$20,000$; current ratio $33,200 \div 13,200 \approx 2.52$.
7. Investing; operating; financing; financing; investing; operating.
8. $30,000 + 6,000 - 4,500 + 2,000 - 1,500 + 700 = \$32,700$.
9. $32,700 - 25,000 + 10,000 - 15,000 = +2,700$; ending cash \$10,700.
10. Many costs stayed the same regardless of output, so larger production runs lowered the cost per piece; he pushed for longer runs and set prices from real costs.
11. Net income flows from the income statement to the statement of owner's equity; ending capital flows to the balance sheet; the change in cash on the cash-flow statement equals the change in the balance sheet's cash.
12. Sales on credit not yet collected; cash tied up in inventory; large equipment purchases; loan repayments; owner withdrawals.
13. Audited financial statements for companies selling securities to the public and regular reports for listed companies, enforced by the SEC; the 10-K is the annual report filed with the SEC.
14. $0.24 \div 2.40 = 10\%$.
15. The independent auditor's opinion on whether the statements fairly present the company's position and results under GAAP; a lender relies on it because it cannot inspect the books itself.
16. A strong answer pairs stakeholders with appropriate figures (for example, lenders: current ratio, interest coverage, operating cash flow; owners: net income and margin; workers: profitability and cash to meet payroll; community: size and stability), and honestly names limits (working conditions,

product quality, honesty with customers, community effects) that require other evidence.

PORTFOLIO PIECE: A COMPLETE SET OF STATEMENTS AND A STAKEHOLDER REPORT

Prepare a complete set of four financial statements (income statement, statement of owner's equity, classified balance sheet and statement of cash flows) for a business whose books you kept in Units 2–3 or for a realistic case with two years of balance sheets. Add a one-page analysis with margins, working capital, the current ratio and the change in cash explained. Then attach your Lesson 4.5 stakeholder report on a real public company.

LOOK FOR	WHAT IT MEANS
Statements	All four statements properly headed, correctly classified, articulating with one another, and balanced.
Cash flows	Indirect method done correctly; net change proved against the balance sheets.
Analysis	Margins, working capital and current ratio computed and interpreted in plain words.
Stakeholder report	Uses real figures from a real annual report, rates all six stakeholders with reasons, and admits the limits of the evidence.

UNIT 5

CASH AND INTERNAL CONTROL

Cash is the asset most easily lost, stolen or miscounted, and it is the asset every business needs most. This unit teaches the tools that protect it: the bank reconciliation, which goes back to the first goldsmiths' cheques of the 1600s; the petty cash fund and the cash register, which began when James Ritty of Dayton patented his "Incorruptible Cashier" in 1879; and the whole system of internal control, whose principles the apostle Paul followed when he arranged for others to travel with the collection for Jerusalem.

Then you will study one of the great frauds of history, Ivar Kreuger's match empire, which collapsed in 1932 and helped bring about the securities laws of 1933 and 1934, and you will close the first half of the course with the ethics of the accounting profession and the accountant's calling. A midterm exam on Units 1–5 follows this unit.

PREREQUISITES

- Journal entries and the trial balance (Unit 2)
- Financial statements, especially the cash-flow statement (Unit 4)

MASTERY CHECKLIST

- ☐ I can prepare a bank reconciliation and the journal entries it requires.
- ☐ I can establish and replenish a petty cash fund and record cash short and over.
- ☐ I can name the five components of internal control and design controls with separation of duties.
- ☐ I can explain the fraud triangle and spot red flags of fraudulent reporting, using the Kreuger case.
- ☐ I can apply the principles of professional ethics to real dilemmas and explain accounting as a vocation.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Investor.gov (U.S. Securities and Exchange Commission)**: Free. See its section on protecting your investments from fraud, with plain-English warning signs of Ponzi schemes. Use with Lesson 5.4. Ages 15 and up.
- **Principles of Accounting, Volume 1 (OpenStax), Chapter 8**: Free. “Fraud, Internal Controls, and Cash,” with extra bank reconciliation and petty cash exercises.
- **“The Use of Money,” a sermon by John Wesley (1760)**: Free. Wesley’s sermon on gaining, saving and giving all you can, without harming others. A good companion to Lesson 5.5. Ages 14 and up.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

5.1	Cash and the Bank Reconciliation	3 sessions of 50 minutes
5.2	Petty Cash and the Incorruptible Cashier	3 sessions of 50 minutes
5.3	Internal Control and Separation of Duties	3 sessions of 50 minutes
5.4	Fraud: Ivar Kreuger and the 1932 Collapse	3 sessions of 50 minutes
5.5	Ethics and the Accountant’s Vocation	3 sessions of 50 minutes

UNIT 5 TEST

Calculators are allowed. Show your work. Every journal entry must balance. Answer the concept questions and the essay in complete sentences. The test is worth 100 points.

1. **10 pts**

Prepare a bank reconciliation: bank balance \$7,280; book balance \$6,613; deposit in transit \$1,450; outstanding checks \$1,320 and \$615; service charge \$20; NSF check \$260; interest earned \$12; a \$380 check for supplies was recorded in the books as \$830.

2. **6 pts**
Journalize the book-side entries from a reconciliation with: interest earned \$12; service charge \$20; NSF check \$260; a supplies check overstated in the books by \$450.
3. **4 pts**
Why are deposits in transit not journalized?
4. **6 pts**
A \$250 petty cash fund has vouchers: postage \$46.20, supplies \$73.45, delivery \$60.00. Cash on hand is \$68.10. Journalize the replenishment.
5. **4 pts**
Register sales \$1,516.40; cash counted from sales \$1,519.90. Journalize.
6. **5 pts**
What did Ritty's cash register do that an open cash drawer could not?
7. **6 pts**
Name the five components of internal control and give one example of a control activity.
8. **6 pts**
One employee at a small business opens the mail, deposits customer checks, records receipts and reconciles the bank. Name the risk and two controls.
9. **4 pts**
Explain the fraud triangle.
10. **6 pts**
A company with profits of \$3 million and 4 million shares pays \$1.25 a share in dividends. How much comes from capital, and why is it a red flag?
11. **6 pts**
Reported assets \$250 million include \$90 million of unconfirmed bonds; liabilities \$200 million. If the bonds are fictitious, what is true equity?

12. (5 pts)

Name two weaknesses Kreuger exploited and the accounting safeguard against each.

13. (4 pts)

What happened in Edinburgh in 1854 and in New York in 1896?

14. (6 pts)

Name four principles of the AICPA Code and explain one.

15. (7 pts)

A manager whose bonus is 4% of net income asks you to postpone recording \$15,000 of December expenses. Compute his gain and explain, using the six-step method briefly, what you would do.

16. (15 pts)

Essay: Using 2 Corinthians 8:20-21 and either the Exchequer tallies or the cash register, explain why internal controls are a service to honest people as well as a defense against dishonest ones. Apply your argument to a church or small business you know (without names).

ANSWER KEY

1. Bank: $7,280 + 1,450 - 1,320 - 615 = \$6,795$. Book: $6,613 + 12 + 450 (830 - 380) - 20 - 260 = \$6,795$.
2. Dr Cash 12, Cr Interest Revenue 12. Dr Bank Service Charge Expense 20, Cr Cash 20. Dr A/R 260, Cr Cash 260. Dr Cash 450, Cr Supplies 450.
3. They are already recorded in the books; the bank will record them shortly.
4. Vouchers 179.65; expected cash 70.35; shortage 2.25. Dr Postage 46.20, Supplies Expense 73.45, Delivery 60.00, Cash Short and Over 2.25; Cr Cash 181.90.
5. Dr Cash 1,519.90; Cr Sales 1,516.40; Cr Cash Short and Over 3.50.
6. It recorded each sale on a dial the customer could see, rang a bell, and kept a locked running total that clerks could not change, so the owner could compare cash with the record.
7. Control environment, risk assessment, control activities, information and communication, monitoring. Example: separation of duties, dual signatures, prenumbered documents, locked storage, independent reconciliation.
8. She could steal receipts and hide it. Controls: the owner opens mail and lists checks; someone else reconciles the bank; the owner reviews customer statements or receivable reports.
9. Pressure, opportunity and rationalization are usually all present when fraud occurs; controls reduce opportunity.
10. Dividends \$5 million; \$2 million from capital. Paying returns that profits cannot support, like Kreuger, can only continue with new money.
11. $160 - 200 = -\$40$ million (insolvent).
12. Secret, unaudited books (independent audits with access to all records); related-company transactions (consolidated statements); forged assets (confirmation with issuers); dividends from capital (cash-flow statement).
13. The Society of Accountants in Edinburgh received the first royal charter for accountants; New York passed the first CPA law.
14. Responsibilities, public interest, integrity, objectivity and independence, due care, scope and nature of services (any four, with a correct explanation).
15. Gain \$600. Facts and issue (misstating income, conflict of interest); principles (matching, integrity); options; decline and record in December, explain respectfully, escalate if pressed, document.

16. A strong answer explains that controls make honest conduct visible and provable, protect the innocent from suspicion, remove temptation, and reassure those who give or invest; it uses the chosen historical example accurately and applies specific controls (two counters, separate reconciliation, dual signatures) to a realistic organization.

PORTFOLIO PIECE: A CASH-CONTROL HANDBOOK FOR A SMALL ORGANIZATION

Write a short handbook (4–6 pages) of cash procedures for a real small organization (with permission) or a realistic one: how cash and checks are received, counted, deposited and recorded; how bills are approved and paid; how petty cash works; and how and by whom the bank account is reconciled each month. Include a flow chart, sample forms (a count sheet, a petty cash voucher, a reconciliation template), one completed sample reconciliation, and a page on the ethics and calling of those who handle the organization's money.

LOOK FOR	WHAT IT MEANS
Procedures	Clear steps for receipts, disbursements, petty cash and reconciliation, with roles named.
Separation of duties	No one role controls authorization, custody and recording; reconciliation is independent.
Forms and sample	Usable count sheet, voucher and reconciliation template, with a correct completed reconciliation.
Ethics page	Connects the procedures to honesty, stewardship and service, with Scripture or a historical example.

5.1 CASH AND THE BANK RECONCILIATION

OBJECTIVES

- Explain why a company's cash balance and its bank statement balance usually differ.
- Prepare a bank reconciliation with deposits in transit, outstanding checks, bank charges, NSF checks, collections and errors.
- Journalize the entries required by the book side of a reconciliation.

Warm-up. Suppose you write a check to a friend on Friday and he does not cash it until the next Thursday. On Monday, your bank's website shows a higher balance than your own record. Which number is your "real" balance? Write your reasoning.

WATCH

How To Do A Bank Reconciliation (EASY WAY)

Accounting Stuff · 17:01

<https://www.youtube.com/watch?v=zhmO3DM3YiY>

WHEN TO WATCH

After the big idea; pause before each adjustment and decide whether it belongs on the bank side or the book side.

BACKUP VIDEO

FA18 – What Is a Bank Reconciliation? - Accounting for Beginners

Tony Bell · 11:25

<https://www.youtube.com/watch?v=CqkOvdMNFxo>

Before the practice set.

KEY TERMS

bank reconciliation

A schedule that explains the difference between the cash balance on the bank statement and the cash balance in the company's books, and arrives at the true (adjusted) cash balance.

deposit in transit

A deposit recorded in the books but not yet on the bank statement. Added to the bank balance.

outstanding check

A check written and recorded in the books but not yet paid by the bank. Subtracted from the bank balance.

NSF check

A customer's check returned by the bank for "not sufficient funds." Subtracted from the book balance; the customer owes the amount again.

service charge

A fee the bank deducts from the account. Subtracted from the book balance.

credit memo / collection

An amount the bank added to the account, such as a note or interest it collected for the company. Added to the book balance.

CORE IDEAS

The story. Goldsmiths in seventeenth-century London kept their customers' gold and silver safe and began to accept written orders to pay it to someone else. The oldest surviving handwritten cheque in Britain is dated 1659 and orders the goldsmith-bankers Morris and Clayton to pay £400 to a Mr. Delboe. From the beginning, a cheque created a problem: the person who wrote it recorded the payment at once, but the banker paid it only when it was presented, days or weeks later. The two sets of books never agreed exactly on any given day.

How they figured it out. Businesses learned to compare the bank's record with their own regularly and explain every difference. Some differences are only timing: deposits the bank has not yet recorded and checks that have not yet cleared. Others are things the business has not yet heard about: bank fees, interest earned, a customer's check that bounced, a note the bank collected. And some are errors, by the business or the bank. The **bank reconciliation** sorts them out.

The big idea. A reconciliation has two sides that must end at the same adjusted balance. **Bank side:** balance per bank statement + deposits in transit – outstanding checks ± bank errors. **Book side:** balance per books + collections and interest added by the bank – service charges – NSF checks ± book errors. Only the book-side items need journal entries, because the company's books have not yet recorded them; the bank-side items will clear by themselves. A reconciliation that will not balance means an error, or worse.

In business today. Accounting software downloads bank transactions and matches them automatically, but someone must still review the unmatched items and approve the reconciliation, ideally someone who does not write checks or handle deposits. Auditors check that reconciliations were done every month, because an unreconciled bank account is one of the easiest places to hide theft.

Think it through. A habit worth keeping for life: reconcile your own bank account every month. It catches errors, fraud and forgotten subscriptions while they are still small.

PICTURE STUDY



Inside the People's Savings Association, Toledo, Ohio, Unknown photographer, about 1900 · Photograph · Toledo-Lucas County Public Library (via the Digital Public Library of America)

Image: [Wikimedia Commons](#), public domain

A savings association took in small deposits and lent the money out, often to families buying homes. Behind the tellers' grilles, clerks kept a ledger page for every depositor.

Look closely

- Find the tellers' windows and the grilles. What do they protect?
- Look at the decoration of the grilles and woodwork.
- Find any clock or calendar. Why would dates matter to a bank?
- Notice the materials: wood, brass, marble. What do they say?

Talk about it

1. The bank's record of a depositor's account and the depositor's own record were kept in different places. Why would they not always agree?
2. How would a depositor in 1900 have checked the bank's figures?
3. Why would a bank want its own clerks' work checked by someone else?

PROJECT

Reconcile a Real Bank Statement

You will reconcile a real bank statement with a parent, or a realistic sample, and record the book-side entries.

You will need

- A recent bank statement and the matching check register or account record, shared by a parent with account numbers blacked out (or the sample below)
- Ledger notebook or spreadsheet

Steps

1. With a parent, choose a month's bank statement and the family's own record of that account. Black out all account numbers. If none is available, use the sample: book balance \$2,428.00; bank balance \$2,862.15; deposit in transit \$350.00; outstanding checks \$412.75 and \$398.00; service charge \$8.00; interest earned \$1.20; an automatic payment of \$64.80 not yet recorded; a check for \$27.50 recorded in the register as \$72.50.
2. Tick every item that appears in both records.
3. List the unticked items and decide whether each is a bank-side or book-side item.
4. Prepare the reconciliation with both sides and a proper heading.
5. Make sure both sides agree. If not, look for a missed item, a transposition or an arithmetic error.
6. Write the journal entries (or register corrections) for the book-side items.
7. Rebuild the reconciliation in a spreadsheet with a check cell.
8. Write a paragraph: what you found, and why a monthly reconciliation is worth the time.

Tips

- Start with the oldest unticked items; outstanding checks from last month should clear this month.
- Keep real statements at home; never post or share them.

Check your work

- ☐ For the sample, both sides equal \$2,401.40.
- ☐ Every unticked item is explained.
- ☐ My book-side entries bring the account to the adjusted balance.

LEDGER NOTEBOOK

1. Draw the reconciliation as two columns that meet at one balance, labeling which items go on each side.
2. Copy Riverside Supply's reconciliation and entries.
3. Write one rule for honest reconciliations.

KEY FORMULAS

Adjusted bank balance = Bank balance + Deposits in transit – Outstanding checks ± Bank errors

Adjusted book balance = Book balance + Collections – Charges – NSF ± Book errors

From history. The word “cheque” (or “check”) may come from the exchequer, the royal treasury, or from the counterfoil kept to “check” against fraud. Early cheques were handwritten letters to a banker; printed forms came later in the 1700s.

WORKED EXAMPLES

Example 1. Riverside Supply's bank statement on May 31 shows \$5,375; its Cash account shows \$4,627. Reconcile using: deposit in transit \$1,200; outstanding checks #412 \$680 and #415 \$1,045; service charge \$25; a customer's NSF check \$310; the bank collected a \$500 note receivable plus \$40 interest for the company; check #409 for supplies was written for \$68 but recorded in the books as \$86.

Show solution

1. Bank side: $5,375 + 1,200 - 680 - 1,045 = \$4,850$.
2. Book side: $4,627 + 500$ (note collected) $+ 40$ (interest) $+ 18$ (book error: $86 - 68$) $- 25$ (service charge) $- 310$ (NSF check) $= \$4,850$.
3. Both sides agree at \$4,850, the true cash balance at May 31.

Answer: Adjusted cash balance \$4,850.

Example 2. Journalize the entries Riverside Supply needs from its reconciliation.

Show solution

1. Note and interest collected: Debit Cash \$540; credit Notes Receivable \$500; credit Interest Revenue \$40.
2. Book error on check #409 (supplies overstated): Debit Cash \$18; credit Supplies \$18.
3. Service charge: Debit Bank Service Charge Expense \$25; credit Cash \$25.
4. NSF check (the customer owes it again): Debit Accounts Receivable \$310; credit Cash \$310.
5. Check: $4,627 + 540 + 18 - 25 - 310 = \$4,850$.

Answer: Four entries bring the Cash account to \$4,850.

Example 3. A bookkeeper's reconciliation shows an adjusted bank balance of \$8,240 and an adjusted book balance of \$8,060. What should be done?

Show solution

1. The difference is \$180, so the reconciliation is not complete.
2. Check for a missed item (an outstanding check, a deposit, a fee), a transposition ($180 \div 9 = 20$), or an error by the bank.
3. Never “plug” the difference with a made-up entry. Unexplained differences must be found; they can be errors or theft.

Answer: Find and explain the \$180 difference before signing the reconciliation.

PRACTICE

1. Easy Which items go on the bank side of a reconciliation?

Show answer

Deposits in transit, outstanding checks, and bank errors.

2. Easy Which side needs journal entries, and why?

Show answer

The book side, because the company has not yet recorded those items.

3. **Easy** What is an NSF check, and how is it recorded?

Show answer

A customer check returned for insufficient funds; debit Accounts Receivable, credit Cash.

4. **Medium** Bank balance \$3,400; deposit in transit \$600; outstanding checks \$950. Adjusted bank balance?

Show answer

\$3,050.

5. **Medium** Book balance \$3,180; service charge \$15; interest earned \$5; NSF check \$120. Adjusted book balance?

Show answer

\$3,050.

6. **Medium** Journalize the interest earned and the service charge from Problem 5.

Show answer

Debit Cash \$5, credit Interest Revenue \$5; debit Bank Service Charge Expense \$15, credit Cash \$15.

7. **Medium** A \$450 check for rent was recorded in the books as \$540. On which side is it corrected, by how much, and what is the entry?

Show answer

Book side, add \$90; debit Cash \$90, credit Rent Expense \$90.

8. **Hard** Bank \$12,640; book \$11,915. Deposit in transit \$2,100; outstanding checks \$2,760; bank collected a \$1,000 note and \$35 interest; service charge \$30; NSF check \$440; the bank charged another company's \$500 check to this account by mistake. Prepare both sides.

Show answer

Bank: $12,640 + 2,100 - 2,760 + 500 = 12,480$. Book: $11,915 + 1,035 - 30 - 440 = 12,480$.

9. **Hard** Why should the person who reconciles the bank account not be the person who writes checks?

Show answer

So no one person can both take cash and hide it; the reconciler would notice unauthorized checks.

10. **Hard** Why did the earliest cheques create the need for reconciliation?

Show answer

The writer recorded the payment at once, but the banker paid it only when presented, so the two records differed in timing.

11. **Challenge** A clerk steals \$300 from a deposit and, in the reconciliation, adds a fictitious \$300 “deposit in transit.” How would an auditor catch this?

Show answer

By checking that the deposit in transit appears on the next bank statement within a few days; a fictitious one never clears.

COMMON MISTAKES

- Putting outstanding checks on the book side.
- Journalizing bank-side items.
- Plugging an unexplained difference instead of finding it.

Make it a game • Bank Versus Books Face-Off. Your parent writes a short bank statement and a matching check register that differ by five items: a deposit in transit, an outstanding check, a service charge, an NSF check and a collection. Find each difference and say whether it adjusts the bank side or the book side. Reconcile both to the same balance. Race a timer, then swap sets.

5.2 PETTY CASH AND THE INCORRUPTIBLE CASHIER

OBJECTIVES

- Explain how James Ritty's cash register (1879) and John H. Patterson's National Cash Register Company changed the control of cash sales.
- Establish, use and replenish a petty cash fund on the imprest system.
- Record cash shortages and overages with Cash Short and Over.

Warm-up. Imagine a small shop where three people take turns at the counter and money goes into an open drawer. At the end of the day the drawer is \$15 short. Who took it? How would you know? Write two ideas for preventing it.

WATCH

How to Account for Petty Cash

Edspira • 3:58

<https://www.youtube.com/watch?v=F-5KZcHrg7k>

WHEN TO WATCH

Before the worked examples.

BACKUP VIDEO

The Evolution of Cash Registers

History of Simple Things • 9:12

https://www.youtube.com/watch?v=IRLuGpth_MY

With the story, as a short history of the cash register. Stop when it reaches modern self-checkouts if you like.

KEY TERMS

petty cash fund

A small amount of cash kept on hand, under one custodian, for minor payments such as postage or small supplies.

imprest system

A petty cash method in which the fund is kept at a fixed amount: receipts plus cash on hand always equal the fund, and the fund is replenished by the total spent.

petty cash voucher

A receipt form signed by the person receiving petty cash, showing the date, amount and purpose.

Cash Short and Over

An account that records small differences between the cash that should be on hand and the cash actually counted; a shortage is a debit (expense), an overage a credit.

CORE IDEAS

The story. In 1878 James Ritty, a businessman in Dayton, Ohio, suspected that his employees were keeping some of the cash customers paid. On a steamship voyage to Europe he watched a device that counted the turns of the ship's propeller, and it gave him an idea. With his brother John he built a machine that rang up each sale on a dial customers could see and kept a running total that clerks could not change. They patented "Ritty's Incorruptible Cashier" in 1879. In 1884 John H. Patterson bought the struggling company and renamed it the National Cash Register Company. Patterson trained salesmen, added a paper roll that printed every sale, and sold registers to shops across the world.

How they figured it out. The register worked because it made a record that the person handling the cash could not alter: a bell rang, the amount showed to the customer, and the total was locked inside. At the end of the day the owner compared the cash in the drawer with the register's total. Any difference was visible at once. The same principle governs **petty cash**: keep a fixed fund under one person, require a signed receipt for every payment, and check that receipts plus cash always equal the fund.

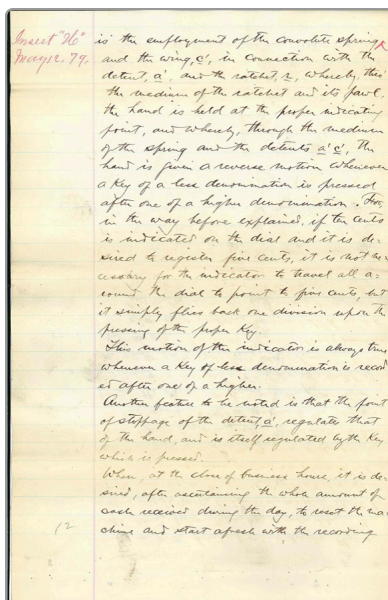
The big idea. On the **imprest system**: (1) to establish the fund, debit Petty Cash and credit Cash for the fixed amount; (2) as payments are made, the custodian collects signed vouchers but makes no journal entries; (3) to replenish, total the vouchers by type, count the cash, and write a check for the amount needed to bring the fund back up: debit each expense, credit Cash. If receipts plus cash do not equal the fund, the difference goes to **Cash Short and Over**. Petty Cash itself is debited or credited only when the size of the fund changes.

In business today. Many offices replace petty cash with company cards that have low limits and report every purchase, but the principle is the same: small payments under one responsible person, every one documented, and the total regularly

reconciled. Retail point-of-sale systems are the descendants of Ritty's machine: every sale is recorded at once, the customer sees the amount, and each cashier's drawer is counted against the system at the end of the shift.

Who gained? Honest clerks gained too: a register protected them from suspicion, because the record showed exactly what each one had taken in. Good controls protect the innocent as much as they catch the guilty.

PICTURE STUDY



Patent Drawing for Ritty's Cash Register, James and John Ritty, inventors (U.S. Patent Office file), 1879 ·

Ink drawing in a patent case file · National Archives, Washington

Image: [Wikimedia Commons](#), public domain

Patent No. 221,360 was granted to James and John Ritty on November 4, 1879, for an “Improvement in Cash Register and Indicator.” The patent file in the National Archives includes the inventors’ drawings and papers.

Look closely

- Find the red note at the top of the page.
- Look for words about keys, the dial and “cents.”
- Find the part that explains what happens at the close of business hours.
- Notice the letters (a, a') that refer to parts in the drawings.

Talk about it

1. Which part of the machine kept the record the clerk could not change?
2. How is a patent itself a kind of record that protects an inventor?
3. What modern machines do the same job as Ritty's register?

Safety first. Handling real cash is for adults or for students supervised by a parent. Count money with the custodian present, never leave a cash box unattended, and never carry a business's cash home alone.

PROJECT

Run an Imprest Fund for a Month

With a parent, you will run a small imprest fund for household or club purchases for a month, then replenish and record it.

You will need

- A small envelope or box with a fixed amount set by a parent (for example \$40), or play money
- Voucher slips (index cards)
- Ledger notebook

Steps

1. With a parent, agree on a fixed fund amount and what it may be used for (stamps, small school supplies, garden seeds).
2. Make voucher slips with: number, date, paid to, purpose, amount, signature of the person receiving the money.
3. For one month, every payment from the fund needs a numbered voucher and, if possible, a store receipt stapled to it.
4. Once a week, count the cash and add up the vouchers. Cash plus vouchers should equal the fund.
5. At month-end, sort the vouchers by type and total each type.
6. Write the replenishment entry, including Cash Short and Over if needed, and have the parent “replenish” the fund to its fixed amount.
7. Write a short report: how well the controls worked, any shortages or overages, and what you would change.
8. If you use play money, have a parent act as the paying clerk and record the same steps.

Tips

- Number vouchers in advance so a missing one is noticed.
- Never pay yourself from the fund without a voucher signed by the parent.

Check your work

- ☐ Every payment has a numbered, signed voucher.
- ☐ My weekly counts show cash plus vouchers equal to the fund, or an explained difference.
- ☐ My replenishment entry balances and restores the fund to its fixed amount.

LEDGER NOTEBOOK

1. Draw a petty cash box with its vouchers and write the imprest rule: cash + vouchers = fund.
2. Copy the replenishment entry from Worked Example 1.
3. Write three features of Ritty's register and the control each provided.

From history. Patterson's NCR became famous for training its salesmen with a printed sales manual and for its factory in Dayton, where he built well-lit workrooms, offered lunches and baths for employees, and planted gardens. Several leaders trained at NCR later built other great companies, including Thomas J. Watson Sr. of IBM.

WORKED EXAMPLES

Example 1. On June 1 an office sets up a \$200 petty cash fund. By June 30 the vouchers show: postage \$42.50; office supplies \$38.75; delivery charges \$55.00; cleaning supplies \$21.30. Cash on hand is \$39.15. Journalize the establishment and the replenishment.

Show solution

1. June 1: Debit Petty Cash \$200; credit Cash \$200.
2. Vouchers total: $42.50 + 38.75 + 55.00 + 21.30 = \$157.55$.
3. Expected cash on hand: $200 - 157.55 = \$42.45$. Actual: \$39.15. Shortage: \$3.30.
4. Replenish the fund back to \$200: $200 - 39.15 = \$160.85$.
5. June 30: Debit Postage Expense \$42.50; Debit Office Supplies Expense \$38.75; Debit Delivery Expense \$55; Debit Cash Short and Over \$3.30; credit Cash \$160.85. (Office supplies 38.75 + cleaning supplies 21.30 = 60.05.)

Answer: Replenishment check \$160.85; shortage \$3.30 debited to Cash Short and Over.

Example 2. A cash register's tape shows sales of \$1,284.60 for the day. The drawer, after removing the \$150 starting change fund, holds \$1,287.10. Journalize the day's sales.

Show solution

1. Cash counted from sales: \$1,287.10. Sales per register: \$1,284.60. Overage: \$2.50.
2. Debit Cash \$1,287.10; credit Sales Revenue \$1,284.60; credit Cash Short and Over \$2.50.

Answer: Cash \$1,287.10; Sales \$1,284.60; overage \$2.50 credited to Cash Short and Over.

Example 3. The office in Worked Example 1 decides to increase the fund from \$200 to \$300 at the July 31 replenishment, when vouchers total \$171.20 and cash on hand is \$28.80. Journalize.

Show solution

1. Vouchers 171.20 + cash 28.80 = \$200.00, so there is no shortage.
2. Replenish \$171.20 and add \$100 to the fund: check for \$271.20.
3. Debit Petty Cash \$100; Debit Various Expenses \$171.20; credit Cash \$271.20.

Answer: Debit Petty Cash \$100 (the increase) and the expenses \$171.20; credit Cash \$271.20.

PRACTICE

1. Easy What did James Ritty invent, and why?

Show answer

A cash register, patented in 1879, because he suspected employees of keeping customers' cash; it recorded each sale where clerks could not change it.

2. Easy Who built the National Cash Register Company?

Show answer

John H. Patterson, who bought Ritty's company in 1884.

3. **Easy** When is the Petty Cash account itself debited?

Show answer

When the fund is established or increased.

4. **Medium** Journalize establishing a \$150 petty cash fund.

Show answer

Debit Petty Cash \$150; credit Cash \$150.

5. **Medium** A \$150 fund has vouchers for postage \$31.00, supplies \$44.60 and parking \$18.00; cash on hand is \$56.40. Journalize the replenishment.

Show answer

Vouchers \$93.60; expected cash \$56.40, actual \$56.40, no shortage. Debit Postage 31.00, Supplies Expense 44.60, Parking Expense 18.00; credit Cash 93.60.

6. **Medium** Same fund, but cash on hand is \$53.90. What changes?

Show answer

Shortage \$2.50: also debit Cash Short and Over \$2.50; credit Cash \$96.10.

7. **Medium** Register sales \$942.30; cash from sales counted \$938.80. Journalize.

Show answer

Debit Cash \$938.80 and Cash Short and Over \$3.50; credit Sales \$942.30.

8. **Hard** Over a month, Cash Short and Over has debits of \$14.20 and credits of \$5.90. Where does its balance appear on the income statement?

Show answer

A net debit of \$8.30, shown as a miscellaneous expense.

9. **Hard** Why are no journal entries made when individual petty cash payments are made?

Show answer

To save work on small items; the vouchers are kept and the expenses are recorded together when the fund is replenished (and at period-end).

10. **Hard** A cashier's drawer is short by small amounts almost every day. What should a manager do?

Show answer

Investigate: retrain on making change, check the register, watch for a pattern by person and time, and consider separating duties or surprise counts; repeated shortages may indicate theft.

11. **Challenge** Explain how the cash register's three features (a visible amount, a bell, a locked total) each made theft harder.

Show answer

The visible amount let customers check what was rung up; the bell drew attention whenever the drawer opened; the locked total gave the owner an unchangeable record to compare with the cash.

COMMON MISTAKES

- Debiting Petty Cash for each replenishment.
- Forgetting the Cash Short and Over entry when the count does not match.
- Paying from petty cash without a voucher.

Make it a game • Imprest Fund Challenge. Put exactly 20 dollars of play coins in an envelope. Your parent asks for small purchases, and you issue a petty cash voucher for each. After six requests, replenish the fund to exactly 20 dollars and journalize the entry. Your parent secretly removes one coin, so you must record Cash Short and Over. Explain how Patterson's cash register built trust.

5.3 INTERNAL CONTROL AND SEPARATION OF DUTIES

OBJECTIVES

- Name the five components of internal control and give an example of each.
- Explain separation of duties and other control activities: authorization, documentation, physical safeguards, independent checks and rotation.
- Use the fraud triangle to explain why fraud happens and how controls reduce it.

Warm-up. In your house, who is allowed to spend money, who keeps the receipts, and who checks the bank account? Is it the same person? Write down how a mistake (or a dishonest act) would be noticed.

WATCH

The 5 Components of Internal Control

Edspira • 5:00

https://www.youtube.com/watch?v=l5_n4yi9dMU

WHEN TO WATCH

After the big idea.

BACKUP VIDEO

Segregation of Duties

Edspira • 6:07

<https://www.youtube.com/watch?v=gdReLybtn3s>

Before the worked examples on separation of duties.

KEY TERMS

internal control

The policies and procedures a business uses to protect its assets, keep accurate records, operate efficiently and follow laws.

separation (segregation) of duties

Dividing a process so that no one person controls all of it: authorizing a transaction, having custody of the asset, and recording it should be done by different people.

fraud triangle

Three conditions usually present when fraud occurs: pressure (a financial need), opportunity (weak controls) and rationalization (an excuse).

independent check

A review of someone's work by another person, such as a bank reconciliation by someone who does not handle cash, or a surprise count.

COSO framework

The widely used model of internal control from the Committee of Sponsoring Organizations, first published in 1992, with five components: control environment, risk assessment, control activities, information and communication, and monitoring.

CORE IDEAS

The story. Around AD 55 the apostle Paul organized a collection among the churches of Greece and Asia Minor for the poor believers in Jerusalem. He did not carry the money alone. The churches chose men to travel with it, and Paul wrote that he arranged it so, “avoiding this, that no man should blame us in this abundance which is administered by us: providing for honest things, not only in the sight of the Lord, but also in the sight of men” (2 Corinthians 8:20-21). In twelfth-century England the royal treasury, the Exchequer, counted the sheriffs' payments on a checkered cloth with several officials watching, and recorded them on notched tally sticks split in two, one half for the sheriff and one for the treasury, so that neither could alter his half without the other knowing.

How they figured it out. Paul and the Exchequer both understood that honest people are protected, and dishonest ones are restrained, when no single person handles money unwatched. Modern accountants have studied why fraud happens. In the 1950s the criminologist Donald Cressey interviewed people imprisoned for embezzlement and found three conditions nearly always present: a **pressure** they felt they could not share, an **opportunity** to take money without being caught, and a **rationalization** (“I’m only borrowing it”). Controls cannot remove every pressure or excuse, but they can remove opportunity.

The big idea. Internal control has five components (the COSO framework). The **control environment:** leaders who model honesty and set clear expectations. **Risk assessment:** asking where errors or theft could occur. **Control activities:** separation of duties (the person who authorizes a payment does not sign the check; the person who handles cash does not record it or reconcile the bank account), authorization limits, prenumbered documents, physical safeguards (safes, locks, passwords), independent checks and required vacations or job rotation. **Information and communication:** accurate records and a way to report problems. **Monitoring:** reviewing whether the controls actually work.

In business today. Small businesses and churches are the most common victims of embezzlement, because one trusted person often does everything: opens the mail, deposits the checks, pays the bills and reconciles the bank. Simple controls cost little: two people count the offering; the treasurer does not reconcile the bank account; bank statements go to someone who does not write checks; every check above a set amount needs two signatures. Large public companies must report on their internal controls each year, a requirement added in 2002 (Lesson 9.4).

Think it through. Controls are not an insult to honest people. Paul, an apostle, insisted on them for his own protection. A good control environment lets everyone say truthfully, “The records show I did right.”

PICTURE STUDY



The Tax Collectors, Marinus van Reymerswaele, about 1540 · Oil on panel · Several versions; this one in a European collection

Image: [Wikimedia Commons](#), public domain

Reymerswaele painted several versions of two tax collectors or bankers at work. The painter exaggerates their faces and clothes to make a point about greed. One man records, the other watches, and the coins lie between them.

Look closely

- Find the account book. Who is writing?
- Find the coins and papers. Who is closest to them?
- Look at the faces. What does the painter want you to feel about these men?
- Look at the clothes and headdresses. Are they realistic or exaggerated?

Talk about it

1. Two men are working together here. Is that a control, or could they cooperate to cheat? (Accountants call that collusion.)
2. What would a third person need to check to keep these two honest?
3. Why do controls protect honest workers as well as catch dishonest ones?

PROJECT

Internal Control Review of a Real Organization

With a parent's help, you will interview someone who handles money for a small organization (a church, club, school booster group or small business) and write a control review.

You will need

- Ledger notebook
- A parent to arrange and attend the interview

Steps

1. With a parent, arrange a short interview with a treasurer, bookkeeper or owner.
2. Ask how money comes in (cash, checks, online), who counts it, who deposits it, who records it and who reconciles the bank account.
3. Ask how bills are approved and paid, and who can sign checks or approve online payments.
4. Draw a flow chart of money coming in and money going out, with a name or role at each step.
5. Mark any step where one person does two of: authorize, have custody, record, reconcile.
6. Using the five COSO components, list one strength and one possible weakness for each.
7. Write three specific, inexpensive recommendations.
8. Write a thank-you note. Share your review with the person only if they would like to see it, and keep it private.

Tips

- Ask about procedures, not about amounts or any person's honesty.
- Most small organizations have at least one weakness; the point is to learn, not to accuse.

Check your work

- ☐ My flow chart shows every step with a role.
- ☐ I identified at least one place where duties are not separated, or explained why they all are.
- ☐ My recommendations are specific and practical.

LEDGER NOTEBOOK

1. Draw the fraud triangle and write a control that reduces opportunity in the middle.
2. Draw a split tally stick and explain why both halves must match.
3. Copy 2 Corinthians 8:21 and write one way to apply it.

From history. The Exchequer used tally sticks for more than six hundred years. When the old sticks were finally burned in 1834, the fire spread and destroyed most of the Houses of Parliament. The checkered cloth used for counting gave the Exchequer its name.

WORKED EXAMPLES

Example 1. At a small church, one volunteer counts the Sunday offering alone, takes it home, deposits it Monday, records it in the books and reconciles the bank account. Identify the weaknesses and design better controls.

Show solution

1. Weaknesses: one person has custody (counting, taking home, depositing), recording and reconciling. The money is unprotected overnight. No one else sees the count.
2. Controls: two unrelated people count together and both sign a count sheet; the offering is placed in a sealed bag in a locked safe or deposited the same day.
3. A different person records the deposit from the signed count sheet.
4. A third person (or the treasurer, who does not count or deposit) receives the bank statement directly and reconciles it, comparing deposits with the count sheets.
5. Rotate counting teams so the same pair is not always together.

Answer: Separate custody, recording and reconciliation, and require two counters.

Example 2. A purchasing clerk can create new suppliers in the computer system, approve invoices and print checks. Explain the risk using the fraud triangle and propose controls.

Show solution

1. Opportunity: the clerk could create a fake supplier (perhaps in a relative's name), approve fake invoices and pay them.
2. If the clerk faces a financial pressure and finds a rationalization, all three conditions are present.
3. Controls: only a manager can add suppliers; invoices must match a purchase order and a receiving report before payment; a different person releases payments; a monthly report of new suppliers and of payments goes to the owner.

Answer: Remove the opportunity by splitting authorization, custody and recording.

Example 3. A store's policy requires every employee to take five consecutive days of vacation each year, during which someone else does the job. Why is this a control? Estimate its value if it uncovers a scheme of taking \$120 a week that has run for three years.

Show solution

1. Many schemes need constant attention (covering shortages, lapping receivables); when someone else does the job, the scheme comes to light.
2. Value: $120 \times 52 \times 3 = \$18,720$ already lost, and \$6,240 a year saved going forward.

Answer: Mandatory vacations reveal schemes that require constant covering-up; here about \$18,720 had been taken.

PRACTICE

1. Easy Name the five components of internal control.

Show answer

Control environment, risk assessment, control activities, information and communication, monitoring.

2. Easy Name the three parts of the fraud triangle.

Show answer

Pressure (incentive), opportunity, rationalization.

3. Easy Which of the three can internal controls most directly reduce?

Show answer

Opportunity.

4. Medium Which three duties should be separated?

Show answer

Authorization, custody of assets, and recording (with reconciliation done by someone else again).

5. Medium Give two physical safeguards for cash and two for inventory.

Show answer

Cash: a safe, locked cash drawers, daily deposits. Inventory: locked storerooms, security tags, cameras, restricted access.

6. Medium Why are documents prenumbered?

Show answer

So a missing document (a voided sale, a missing check) is noticed when the sequence is checked.

7. Medium What did Paul arrange for the collection for Jerusalem, and why (2 Corinthians 8:20-21)?

Show answer

Chosen men traveled with the gift so that no one could blame him; he wanted to be honest before both God and men.

8. Hard How did the Exchequer's split tally sticks work as a control?

Show answer

A payment was notched across a stick, which was split lengthwise; each party kept a half, and the notches had to match when the halves were put together, so neither could alter his record alone.

9. **Hard** A bookkeeper of 20 years never takes a vacation and insists on opening all the mail. Why might an auditor be concerned?

Show answer

These are classic warning signs: someone covering a scheme may avoid letting others see the work or the incoming payments.

10. **Hard** A business has only two people, the owner and one clerk. How can it separate duties?

Show answer

The owner signs all checks, receives and reviews the bank statement directly, approves new suppliers and reviews the books monthly; the clerk handles day-to-day recording.

11. **Challenge** Write a one-paragraph control policy for a youth group's fundraiser that handles cash.

Show answer

Sample: two adults count cash together and sign a tally sheet; cash is kept in a locked box and deposited the next business day; a different adult records the deposit; the treasurer compares the bank deposit with the tally sheet; receipts are kept for every expense.

COMMON MISTAKES

- Thinking controls mean distrust of a particular person; they protect everyone.
- Letting the person who handles cash also reconcile the bank account.
- Believing small organizations are too small to need controls; they are the most common victims.

Make it a game • Control Review Challenge. In sixty seconds, name the five components of internal control and one example of each. Then your parent describes a flawed setup, such as one person receiving cash, recording it and depositing it. Find every weakness, name the fix, whether separation of duties or an independent check, and identify pressure, opportunity and rationalization from the fraud triangle.

Scripture. “Avoiding this, that no man should blame us in this abundance which is administered by us: Providing for honest things, not only in the sight of the Lord, but also in the sight of men.” (2 Corinthians 8:20-21, KJV)

Paul arranged for others to travel with the collection so that his handling of it was open to all. Good internal controls do the same for every steward of money.

5.4 FRAUD: IVAR KREUGER AND THE 1932 COLLAPSE

OBJECTIVES

- Tell how Ivar Kreuger built and hid a fraudulent financial empire and why it collapsed in 1932.
- Identify the accounting red flags of fraud: dividends paid from new capital, secret books, unaudited assets, and profits without cash.
- Explain how the Kreuger collapse helped bring about the securities laws of 1933–34.

Warm-up. A friend's new business pays its investors 20% a year, every year, and never shows anyone its books. Write down what you would want to see before believing it.

WATCH

The Securities Act of 1933 and the Securities Exchange Act of 1934

Edspira • 7:30

<https://www.youtube.com/watch?v=bl9wZenbcs4>

WHEN TO WATCH

After the story, with the core idea on the securities laws that followed the collapse.

Note: No suitable short film about Kreuger himself was found; the lesson text tells his story, and this video explains the 1933 and 1934 laws his collapse helped bring about.

KEY TERMS

fraudulent financial reporting

Deliberately misstating financial statements (inventing assets or revenue, hiding liabilities) to deceive investors or lenders.

Ponzi scheme

A fraud that pays earlier investors with money from new investors rather than from real profits; it collapses when new money stops.

consolidated statements

Statements that combine a parent company and all the companies it controls into one set of figures, eliminating transactions among them.

red flag

A warning sign that calls for closer examination, such as profits without cash, secrecy about books, or transactions with related companies.

CORE IDEAS

The story. Ivar Kreuger (1880–1932), a Swedish engineer, built Swedish Match into the largest match company in the world in the 1910s and 1920s. His great idea was to lend money to governments short of cash after the First World War (France, Germany, Poland, Ecuador and others) in exchange for a monopoly on selling matches in their countries. To raise the money, he sold shares and bonds of his companies, especially to American investors, through Kreuger & Toll and the International Match Corporation. For years they paid high, steady dividends, and Kreuger was celebrated as a genius. He was called the Match King.

How they figured it out. When the Depression came, the money stopped flowing. In March 1932 Kreuger died in Paris, by his own hand, as his companies ran out of cash. Accountants from Price, Waterhouse & Co. were brought in to examine the books, and what they found shocked the world. Kreuger had run some four hundred companies, moving money among them so no outsider could follow it. He had kept the real accounts to himself and refused to let auditors see them. Some of the high dividends had been paid not out of profits but out of new investors' money. And among the assets were Italian government bonds, worth well over \$100 million on paper, that Kreuger had forged himself. The losses to investors were enormous, and many ordinary savers in Sweden and America were ruined.

The big idea. Kreuger's fraud used the weaknesses that sound accounting is built to close. **Secrecy:** no single set of consolidated, audited statements showed the whole empire. **Related-company transactions:** money moved among his firms created profits that were never earned from outsiders. **Fictitious assets:** forged bonds that no auditor had ever checked against the issuer. **Dividends from capital:** payments that looked like profits but were really new investors' money. Each red flag has an answer: independent audits with access to all records, consolidated statements, confirmation of assets with outside parties, and a cash-flow statement that shows whether profit is turning into cash.

In business today. The Kreuger collapse came just as Congress was investigating the crash of 1929, and it was cited in the debates over the Securities Act of 1933 and the Securities Exchange Act of 1934, which required audited statements from public companies. Later frauds, from Charles Ponzi's in 1920 to Bernard Madoff's Ponzi scheme exposed in 2008, have followed the same pattern: steady returns, secrecy, and money from new investors used to pay old ones.

Think it through. Kreuger was brilliant, charming and generous with praise. That is why so many trusted him without seeing his books. Proverbs warns, "Wealth gotten by vanity shall be diminished" (Proverbs 13:11). Trust should be given to records that can be checked, not only to persons who impress.

PICTURE STUDY



Ivar Kreuger, Unknown photographer (studio portrait), about 1920 · Photograph · Sweden

Image: [Wikimedia Commons](#), public domain

This portrait was made about 1920, as Kreuger's match empire was growing. He was admired across Europe and America as a financier who could solve governments' money problems.

Look closely

- Look at his expression and posture. What impression does he give?
- Look at his clothes. What do they say about how he wanted to be seen?
- Notice what is not in the picture: no books, no factory, no papers.
- Compare this portrait with the merchants painted by Holbein with their letters and ledgers.

Talk about it

1. Why do people often trust someone who looks calm, confident and successful?
2. What should investors have asked to see, instead of trusting the man?
3. How would honest consolidated, audited statements have changed the story?

PROJECT

A Red-Flag Investigation

You will analyze a simplified set of statements for a fictional holding company and write an auditor's memo on its red flags.

You will need

- Ledger notebook or spreadsheet

Steps

1. Use this five-year data for “Northern Lights Holdings” (in millions): net income 12, 14, 16, 18, 20; operating cash flow 3, -1, -4, -6, -9; dividends paid 10, 12, 14, 16, 18; new shares and bonds sold 15, 20, 25, 32, 40; receivables from companies controlled by the chairman 20, 34, 50, 70, 95.
2. Put the data in a spreadsheet and chart net income against operating cash flow.
3. Compute, for each year, dividends minus operating cash flow. Where did that money come from?
4. Compute the growth of related-company receivables as a percent of net income.
5. List every red flag you see and the test an auditor should perform for each (confirmation, consolidation, inspection, tracing cash).
6. Write a one-page memo to a fictional board of directors explaining what you found and what you recommend.
7. Add a paragraph on which stakeholders would be harmed if the company collapsed, and how.

Tips

- Look for patterns over several years, not one bad number.
- Remember that you are judging records, not accusing a real person.

Check your work

- ☐ My chart shows net income rising while operating cash flow falls.
- ☐ My memo names at least four red flags and an audit test for each.

- My stakeholder paragraph covers at least four groups.

LEDGER NOTEBOOK

1. Draw Kreuger's empire as a web of boxes with arrows of money among them, and a single box labeled "consolidated, audited statements" that would have shown the truth.
2. Make a table: red flag | what it hides | the control or audit test that exposes it.
3. Write Proverbs 13:11.

From history. The Swedish Match company survived the collapse after reorganization, and many of the match factories and forests Kreuger acquired were real and valuable. The fraud lay not in the factories but in the accounts that claimed far more than they were worth.

WORKED EXAMPLES

Example 1. A company has true profits of \$2 million a year and 10 million shares. It pays a dividend of \$0.50 a share every year to keep its reputation for steady returns. How much of each year's dividend comes from sources other than profit, and where must that money come from?

Show solution

1. Dividends paid: $10,000,000 \times 0.50 = \$5,000,000$.
2. Profit available: \$2,000,000.
3. Shortfall: $5,000,000 - 2,000,000 = \$3,000,000$ a year.
4. It must come from new borrowing, new share sales or selling assets, which is paying investors with their own (or other investors') money.

Answer: \$3 million a year is paid from capital, not profit: a red flag.

Example 2. A holding company reports total assets of \$300 million, including \$140 million of foreign government bonds held in its own vault and never confirmed with the issuing government. If the bonds are fictitious and liabilities are \$180 million, what is the company's true equity?

Show solution

1. Reported equity: $300 - 180 = \$120$ million.
 2. True assets: $300 - 140 = \$160$ million.
 3. True equity: $160 - 180 = -\$20$ million.
-

Answer: True equity is negative \$20 million: the company is insolvent.

Example 3. Company A sells \$10 million of goods to Company B, which Kreuger also controls, on credit. A records \$10 million of revenue and a receivable. B never sells the goods to an outside customer. Explain how consolidation would treat this.

Show solution

1. In consolidated statements, A and B are one economic entity.
 2. A sale from one part of the group to another is not a sale to an outsider, so the \$10 million of revenue and the receivable and payable between them are eliminated.
 3. Without consolidation, the group appears to have \$10 million more revenue and profit than it earned.
-

Answer: Intercompany sales are eliminated in consolidation; separate statements can hide them.

PRACTICE

1. Easy What was Kreuger's business strategy with governments?

Show answer

He lent them money in exchange for national match monopolies.

2. Easy Name four red flags in Kreuger's empire.

Show answer

Secret books; no consolidated audited statements; dividends paid from new capital; forged assets; complex transactions among related companies.

3. Easy What is a Ponzi scheme?

Show answer

A fraud that pays old investors with new investors' money instead of real profits.

4. Medium Profits \$4 million; dividends \$7 million. How much came from capital?

Show answer

\$3 million.

5. Medium Why are transactions between related companies dangerous for readers of separate statements?

Show answer

They can create revenue, profit or assets that were never earned from outsiders; only consolidation eliminates them.

6. Medium How could an auditor have discovered the forged bonds?

Show answer

By confirming the bonds directly with the Italian government (the supposed issuer) and inspecting them carefully.

7. Medium How did the Kreuger collapse influence U.S. law?

Show answer

It added to the evidence, during the investigations after 1929, that investors needed audited, honest disclosure, supporting the Securities Acts of 1933 and 1934.

8. **Hard** Reported assets \$500 million, including \$200 million of unconfirmed receivables from related companies; liabilities \$350 million. If half the related receivables are worthless, what is true equity?

Show answer

Assets 400; equity $400 - 350 = \$50$ million (versus reported \$150 million).

9. **Hard** A company's net income has grown every year for five years, but its operating cash flow has been negative each year. Why is this a red flag?

Show answer

Profits that never become cash may be fictitious or from uncollectible related-party sales; real businesses eventually turn profit into cash.

10. **Hard** Why did Kreuger's personality make the fraud easier?

Show answer

People trusted his reputation and charm instead of demanding audited records; secrecy was accepted from a 'genius.'

11. **Challenge** Write a short paragraph applying Proverbs 13:11 to the Kreuger story and to a modern investment that promises steady high returns.

Show answer

Sample: Kreuger's wealth, gathered by deception, vanished in weeks; any investment promising unusually steady high returns with secrecy about how it earns them deserves the same suspicion. Wealth built by honest labor grows slowly and lasts.

COMMON MISTAKES

- Assuming a large, famous company must have honest books.
- Treating dividends as proof of profit.
- Thinking fraud is always obvious; Kreuger fooled sophisticated bankers for years.

Make it a game • Dividends From Nowhere. Demonstrate a Ponzi scheme with beans. Your parent invests ten beans; you pay dividends using the next investor's beans, then more. Track the pile aloud. Then your parent stops investing and the stack collapses. List the red flags from Ivar Kreuger's 1932 collapse, such as secret books and profits without cash, and say which one your pile showed.

Scripture. "Wealth gotten by vanity shall be diminished: but he that gathereth by labour shall increase." (Proverbs 13:11, KJV)

Kreuger's paper fortune, built partly on deception, vanished in weeks. Wealth built by honest work and honest accounts grows more slowly, and it lasts.

5.5 ETHICS AND THE ACCOUNTANT'S VOCATION

OBJECTIVES

- Describe how accounting became a profession, from the Society of Accountants in Edinburgh (1854) to the first U.S. CPA law (1896).
- Explain the main principles of professional ethics for accountants: integrity, objectivity and independence, due care, confidentiality and the public interest.
- Reason through ethical dilemmas in accounting with a clear method, and connect the work to Christian vocation.

Warm-up. Your manager asks you to record a sale on December 31 that the customer will not receive until January 5, “just to make this year look better. Everyone does it.” Write what you would say.

WATCH

AICPA Code of Professional Conduct: The 6 principles

Farhat Lectures. The # 1 CPA & Accounting Courses · 15:49

<https://www.youtube.com/watch?v=iGr71BQSqEA>

WHEN TO WATCH

After the big idea; take notes on the six principles.

Note: From a CPA-exam review channel; stop at the end of the principles. It mentions its own paid courses.

KEY TERMS

CPA

Certified Public Accountant: an accountant licensed by a state after education, experience and a demanding examination, permitted to sign audit opinions for the public.

integrity

Honesty and candor within the bounds of confidentiality; not bending the truth for anyone.

objectivity and independence

Being impartial and free of conflicts of interest; an auditor must be independent of the company audited, in fact and in appearance.

due care

Doing the work competently and diligently, according to professional standards.

public interest

The accountant's duty to the many people who rely on financial information (investors, lenders, workers, the public), not only to the client who pays.

CORE IDEAS

The story. Jesus called a tax collector to be one of the twelve: "he saw a man, named Matthew, sitting at the receipt of custom: and he saith unto him, Follow me. And he arose, and followed him" (Matthew 9:9). Tax collectors in Judea were despised for collecting more than was due; another, Zacchaeus, promised when he met Jesus to repay fourfold anyone he had cheated (Luke 19:8). Centuries later, accountants worked to make keeping accounts an honorable profession. In 1853 a group of accountants in Edinburgh formed the Society of Accountants in Edinburgh, which received a royal charter in 1854, the first professional body of accountants in the world; its members called themselves Chartered Accountants.

How they figured it out. A profession is more than a skill. It has entrance examinations, standards of work and a code of conduct, and it disciplines members who break them. In the United States, the American Association of Public Accountants was founded in 1887, and in 1896 New York passed the first law creating the title Certified Public Accountant, granted after an examination. Every state followed. Today the American Institute of CPAs (AICPA) publishes a Code of Professional Conduct, and state boards license CPAs and can take away their licenses.

The big idea. The AICPA Code rests on six principles: **responsibilities** (exercise sensitive moral judgment); **the public interest** (serve the public, honor its trust); **integrity**; **objectivity and independence**; **due care**; and the **scope and nature of services** (choose work consistent with these principles). A simple method for any

dilemma: (1) get the facts; (2) name the ethical issue and who is affected; (3) identify the rules and principles that apply; (4) list the options and their consequences for each stakeholder; (5) choose the action you could explain openly to everyone affected; (6) act, and document it. If pressure to misstate persists, go up the chain of authority, and if necessary resign.

In business today. Accountants are tested most often not by grand frauds but by small requests: record this sale a few days early, delay this expense, change this estimate a little. Each is the start of a slope. The people who refuse at the first step rarely face the last one. Many accountants see their work as a calling to serve others with truthful numbers: a church treasurer who lets a congregation trust its giving, a controller whose honest reports keep a company's workers employed, an auditor whose signature lets strangers lend safely.

Think it through. "And whatsoever ye do, do it heartily, as to the Lord, and not unto men" (Colossians 3:23). An accountant who works as unto the Lord does not need an auditor to keep him honest, though he welcomes one.

PICTURE STUDY



The Calling of Saint Matthew, Caravaggio, 1599–1600 · Oil on canvas · Contarelli Chapel, San Luigi dei Francesi, Rome

Image: [Wikimedia Commons](#), public domain

Caravaggio painted Matthew at his tax table, among companions counting money, at the moment Christ calls him. The light from the window follows the line of Christ's pointing hand.

Look closely

- Find Christ. Where is he pointing?
- Find the coins and the account book on the table.
- Find the man who points to himself. Who do you think is Matthew?
- Follow the beam of light. Where does it fall?

Talk about it

1. Matthew left his tax table. Is honest accounting work also a calling, and how?
2. What does the contrast between the men counting coins and the man who looks up suggest?
3. What might Matthew's skill with accounts have offered later, when he wrote a careful, orderly Gospel?

PROJECT

An Ethics Case Book

You will write and analyze three realistic ethical dilemmas in accounting, and interview someone about how they handled pressure at work.

You will need

- Ledger notebook
- A parent to help arrange an interview

Steps

1. Write three short cases (one paragraph each) of ethical pressure in accounting: one about revenue timing, one about an estimate, one about a personal conflict of interest.
2. For each case, work through the six-step method in writing.
3. For each, name the stakeholders affected and how.
4. Name the AICPA principle most involved in each.
5. With a parent, interview an adult who keeps books or manages money (a treasurer, bookkeeper, business owner) about a time they felt pressure to bend a number and how they handled it, without names or private details.
6. Write a one-page reflection on accounting as a vocation, using one Scripture verse from this unit and one idea from the interview.

Tips

- Make the cases realistic and small; most real pressure comes in small requests.
- In the interview, ask about principles, not about any person's wrongdoing.

Check your work

- ☐ My three cases each have a full six-step analysis.
- ☐ I name the stakeholders and the principle in each case.
- ☐ My reflection connects vocation, Scripture and a real person's experience.

LEDGER NOTEBOOK

1. Write the six AICPA principles with a one-line example of each.

2. Make a timeline: 1854 Edinburgh society; 1887 American Association of Public Accountants; 1896 New York CPA law; 1933–34 securities laws.
3. Copy Colossians 3:23.

From history. The first CPA examination in New York, in December 1896, was taken by only a few candidates. Among the earliest CPAs were Frank Broaker and Charles Waldo Haskins, who helped found the firm of Haskins & Sells and the first school of accountancy at New York University in 1900.

WORKED EXAMPLES

Example 1. Use the six-step method: it is December 30, and your supervisor asks you to record a \$40,000 sale for goods that will ship on January 5, saying the company needs to meet its annual target for a bank loan.

Show solution

1. Facts: the goods have not shipped; the customer has not received them; the year ends tomorrow.
2. Issue: recording revenue before it is earned would misstate this year's income; the bank and owners would be misled.
3. Principles: revenue recognition (Lesson 3.1); integrity and the public interest.
4. Options: comply; refuse and explain; propose an honest alternative (disclose the January order to the bank as a strong backlog).
5. Choose: decline to record it in December, explain the rule respectfully, and offer the honest alternative. If pressured further, raise it with the next level of management.
6. Document the conversation in a short, factual memo.

Answer: Record the sale in January when earned; disclose the order honestly; escalate if pressured.

Example 2. A CPA firm is asked to audit a company in which one of the audit partners owns \$50,000 of stock. What principle is involved and what must be done?

Show solution

1. Independence: an auditor with a financial interest in the client is not independent in fact or appearance.
2. The partner must sell the stock before the engagement or be removed from it; firms keep lists of clients in which staff may not invest.

Answer: The partner cannot work on the audit while holding the stock.

Example 3. A bookkeeper finds that a bonus formula pays managers 5% of net income. A manager asks her to delay recording \$8,000 of December repairs until January. How much would the manager gain, and what is wrong?

Show solution

1. Delaying \$8,000 of expense raises this year's net income by \$8,000.
2. Bonus increase: $0.05 \times 8,000 = \$400$ for each manager on the plan.
3. It breaks the matching principle and misstates income; it is also a conflict of interest, because the person asking benefits personally.

Answer: Each manager would gain \$400 by misstating income; the request must be refused.

PRACTICE

1. Easy What was the first professional body of accountants, and when was it chartered?

Show answer

The Society of Accountants in Edinburgh, chartered in 1854.

2. Easy When and where was the first U.S. CPA law passed?

Show answer

New York, 1896.

3. Easy Name the six principles of the AICPA Code.

Show answer

Responsibilities, the public interest, integrity, objectivity and independence, due care, scope and nature of services.

4. Medium Why must an auditor be independent “in appearance” as well as in fact?

Show answer

The public must be able to trust the opinion; even the appearance of a conflict undermines that trust.

5. Medium Give an example of a violation of due care.

Show answer

Signing off on an inventory count without observing it, or preparing statements without checking the trial balance.

6. Medium What did Zacchaeus promise, and what does it suggest about restitution?

Show answer

To give half his goods to the poor and repay fourfold anyone he had cheated (Luke 19:8); real repentance includes making things right.

7. Medium List the six steps of the ethical decision method.

Show answer

Get the facts; name the issue and who is affected; identify rules and principles; list options and consequences; choose an action you could explain openly; act and document.

8. **Hard** A manager’s bonus is 3% of net income. Delaying \$25,000 of expenses would raise the bonus by how much? Why is the request especially troubling?

Show answer

\$750; the person asking benefits personally (a conflict of interest) from misstating the books.

9. **Hard** A client asks his CPA to keep secret that the business owes back taxes. Which principles are in tension, and how should the CPA respond?

Show answer

Confidentiality and integrity/public interest. The CPA may keep client matters private but may not misstate financial statements or assist in concealing liabilities from those entitled to know (lenders, tax authorities); the liability must be recorded and disclosed.

10. **Hard** Why are small requests to “bend” the books often more dangerous than large ones?

Show answer

They seem harmless, so people agree; each one makes the next easier, and a person who has already bent once is under pressure to cover it.

11. **Challenge** Write a paragraph explaining how Colossians 3:23 could shape the daily work of an accountant.

Show answer

Answers should connect working “as to the Lord” with accuracy, diligence, honesty when no one is checking, and service to the people who rely on the numbers.

COMMON MISTAKES

- Thinking ethics only matters in large frauds.
- Confusing confidentiality with permission to conceal what must be disclosed.
- Believing loyalty to a boss outweighs honesty to those who rely on the statements.

Make it a game • Ethics Verdict Round. Your parent reads a short dilemma, such as a client asking you to overlook an error or a friend asking about another client's accounts. In one sentence, name the broken principle: integrity, objectivity and independence, due care, confidentiality or the public interest, and say what you would do. Add one fact about the Edinburgh society of 1854 or the 1896 CPA law.

Scripture. “And whatsoever ye do, do it heartily, as to the Lord, and not unto men;” (Colossians 3:23, KJV)

Accounting done as service to God is honest even when no one is checking, and careful because the work matters to the people who rely on it.

UNIT 5

CASH AND INTERNAL CONTROL

Cash is the asset most easily lost, stolen or miscounted, and it is the asset every business needs most. This unit teaches the tools that protect it: the bank reconciliation, which goes back to the first goldsmiths' cheques of the 1600s; the petty cash fund and the cash register, which began when James Ritty of Dayton patented his "Incorruptible Cashier" in 1879; and the whole system of internal control, whose principles the apostle Paul followed when he arranged for others to travel with the collection for Jerusalem.

Then you will study one of the great frauds of history, Ivar Kreuger's match empire, which collapsed in 1932 and helped bring about the securities laws of 1933 and 1934, and you will close the first half of the course with the ethics of the accounting profession and the accountant's calling. A midterm exam on Units 1–5 follows this unit.

PREREQUISITES

- Journal entries and the trial balance (Unit 2)
- Financial statements, especially the cash-flow statement (Unit 4)

MASTERY CHECKLIST

- ☐ I can prepare a bank reconciliation and the journal entries it requires.
- ☐ I can establish and replenish a petty cash fund and record cash short and over.
- ☐ I can name the five components of internal control and design controls with separation of duties.
- ☐ I can explain the fraud triangle and spot red flags of fraudulent reporting, using the Kreuger case.
- ☐ I can apply the principles of professional ethics to real dilemmas and explain accounting as a vocation.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Investor.gov (U.S. Securities and Exchange Commission)**: Free. See its section on protecting your investments from fraud, with plain-English warning signs of Ponzi schemes. Use with Lesson 5.4. Ages 15 and up.
- **Principles of Accounting, Volume 1 (OpenStax), Chapter 8**: Free. “Fraud, Internal Controls, and Cash,” with extra bank reconciliation and petty cash exercises.
- **“The Use of Money,” a sermon by John Wesley (1760)**: Free. Wesley’s sermon on gaining, saving and giving all you can, without harming others. A good companion to Lesson 5.5. Ages 14 and up.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

5.1	Cash and the Bank Reconciliation	3 sessions of 50 minutes
5.2	Petty Cash and the Incorruptible Cashier	3 sessions of 50 minutes
5.3	Internal Control and Separation of Duties	3 sessions of 50 minutes
5.4	Fraud: Ivar Kreuger and the 1932 Collapse	3 sessions of 50 minutes
5.5	Ethics and the Accountant’s Vocation	3 sessions of 50 minutes

UNIT 5 TEST

Calculators are allowed. Show your work. Every journal entry must balance. Answer the concept questions and the essay in complete sentences. The test is worth 100 points.

1. **10 pts**

Prepare a bank reconciliation: bank balance \$7,280; book balance \$6,613; deposit in transit \$1,450; outstanding checks \$1,320 and \$615; service charge \$20; NSF check \$260; interest earned \$12; a \$380 check for supplies was recorded in the books as \$830.

2. **6 pts**

Journalize the book-side entries from a reconciliation with: interest earned \$12; service charge \$20; NSF check \$260; a supplies check overstated in the books by \$450.

3. **4 pts**

Why are deposits in transit not journalized?

4. **6 pts**

A \$250 petty cash fund has vouchers: postage \$46.20, supplies \$73.45, delivery \$60.00. Cash on hand is \$68.10. Journalize the replenishment.

5. **4 pts**

Register sales \$1,516.40; cash counted from sales \$1,519.90. Journalize.

6. **5 pts**

What did Ritty's cash register do that an open cash drawer could not?

7. **6 pts**

Name the five components of internal control and give one example of a control activity.

8. **6 pts**

One employee at a small business opens the mail, deposits customer checks, records receipts and reconciles the bank. Name the risk and two controls.

9. **4 pts**

Explain the fraud triangle.

10. **6 pts**

A company with profits of \$3 million and 4 million shares pays \$1.25 a share in dividends. How much comes from capital, and why is it a red flag?

11. **6 pts**

Reported assets \$250 million include \$90 million of unconfirmed bonds; liabilities \$200 million. If the bonds are fictitious, what is true equity?

12. (5 pts)

Name two weaknesses Kreuger exploited and the accounting safeguard against each.

13. (4 pts)

What happened in Edinburgh in 1854 and in New York in 1896?

14. (6 pts)

Name four principles of the AICPA Code and explain one.

15. (7 pts)

A manager whose bonus is 4% of net income asks you to postpone recording \$15,000 of December expenses. Compute his gain and explain, using the six-step method briefly, what you would do.

16. (15 pts)

Essay: Using 2 Corinthians 8:20-21 and either the Exchequer tallies or the cash register, explain why internal controls are a service to honest people as well as a defense against dishonest ones. Apply your argument to a church or small business you know (without names).

ANSWER KEY

1. Bank: $7,280 + 1,450 - 1,320 - 615 = \$6,795$. Book: $6,613 + 12 + 450 (830 - 380) - 20 - 260 = \$6,795$.
2. Dr Cash 12, Cr Interest Revenue 12. Dr Bank Service Charge Expense 20, Cr Cash 20. Dr A/R 260, Cr Cash 260. Dr Cash 450, Cr Supplies 450.
3. They are already recorded in the books; the bank will record them shortly.
4. Vouchers 179.65; expected cash 70.35; shortage 2.25. Dr Postage 46.20, Supplies Expense 73.45, Delivery 60.00, Cash Short and Over 2.25; Cr Cash 181.90.
5. Dr Cash 1,519.90; Cr Sales 1,516.40; Cr Cash Short and Over 3.50.
6. It recorded each sale on a dial the customer could see, rang a bell, and kept a locked running total that clerks could not change, so the owner could compare cash with the record.
7. Control environment, risk assessment, control activities, information and communication, monitoring. Example: separation of duties, dual signatures, prenumbered documents, locked storage, independent reconciliation.
8. She could steal receipts and hide it. Controls: the owner opens mail and lists checks; someone else reconciles the bank; the owner reviews customer statements or receivable reports.
9. Pressure, opportunity and rationalization are usually all present when fraud occurs; controls reduce opportunity.
10. Dividends \$5 million; \$2 million from capital. Paying returns that profits cannot support, like Kreuger, can only continue with new money.
11. $160 - 200 = -\$40$ million (insolvent).
12. Secret, unaudited books (independent audits with access to all records); related-company transactions (consolidated statements); forged assets (confirmation with issuers); dividends from capital (cash-flow statement).
13. The Society of Accountants in Edinburgh received the first royal charter for accountants; New York passed the first CPA law.
14. Responsibilities, public interest, integrity, objectivity and independence, due care, scope and nature of services (any four, with a correct explanation).
15. Gain \$600. Facts and issue (misstating income, conflict of interest); principles (matching, integrity); options; decline and record in December, explain respectfully, escalate if pressed, document.

16. A strong answer explains that controls make honest conduct visible and provable, protect the innocent from suspicion, remove temptation, and reassure those who give or invest; it uses the chosen historical example accurately and applies specific controls (two counters, separate reconciliation, dual signatures) to a realistic organization.

PORTFOLIO PIECE: A CASH-CONTROL HANDBOOK FOR A SMALL ORGANIZATION

Write a short handbook (4–6 pages) of cash procedures for a real small organization (with permission) or a realistic one: how cash and checks are received, counted, deposited and recorded; how bills are approved and paid; how petty cash works; and how and by whom the bank account is reconciled each month. Include a flow chart, sample forms (a count sheet, a petty cash voucher, a reconciliation template), one completed sample reconciliation, and a page on the ethics and calling of those who handle the organization's money.

LOOK FOR	WHAT IT MEANS
Procedures	Clear steps for receipts, disbursements, petty cash and reconciliation, with roles named.
Separation of duties	No one role controls authorization, custody and recording; reconciliation is independent.
Forms and sample	Usable count sheet, voucher and reconciliation template, with a correct completed reconciliation.
Ethics page	Connects the procedures to honesty, stewardship and service, with Scripture or a historical example.

UNIT 6

RECEIVABLES AND INVENTORY

Most businesses sell on credit and most stores hold inventory, so receivables and inventory are often the two largest current assets on a balance sheet. This unit begins with Singer's installment plan, which made the sewing machine affordable for millions of families and turned customers' promises into the company's biggest asset, and with the Medici Bank's London branch, ruined in part by loans to a king who did not repay. You will learn to record credit sales and discounts, keep a customer ledger, and estimate bad debts with the allowance method.

Then you will follow inventory from the grocer's clipboard to the first bar-code scan in Troy, Ohio, in 1974; compare the periodic and perpetual systems; compute cost of goods sold under FIFO, LIFO and average cost; and see how Frank Woolworth built a chain of five-and-ten-cent stores by watching his gross margin on every item.

PREREQUISITES

- The income statement and balance sheet (Unit 4)
- Adjusting entries (Unit 3)
- Percents and weighted averages

MASTERY CHECKLIST

- ☐ I can record credit sales, discounts, card sales and collections, and reconcile a customer ledger.
- ☐ I can estimate bad debts by percent of sales and by aging, and record write-offs and recoveries.
- ☐ I can record inventory transactions under the perpetual and periodic systems and compute COGS.
- ☐ I can compute ending inventory and COGS under FIFO, LIFO and weighted average, and explain their effects.
- ☐ I can compute gross margin, markup and inventory turnover and explain what they show.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Principles of Accounting, Volume 1 (OpenStax), Chapters 6, 9 and 10**: Free. Merchandising transactions, receivables and inventory, with more practice problems.
- **LibreOffice Calc**: Free spreadsheet software for the aging schedule and the three-method inventory projects.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

6.1 Accounts Receivable: Singer Sells on Credit

3 sessions of 50 minutes

6.2 Bad Debts: The Medici and the King

3 sessions of 50 minutes

6.3 Inventory Systems: From the Counting Book to the Bar Code

3 sessions of 50 minutes

6.4 FIFO, LIFO and Average Cost

3 sessions of 50 minutes

6.5 Cost of Goods Sold and Gross Margin: Woolworth's Five and Ten

3 sessions of 50 minutes

UNIT 6 TEST

Calculators are allowed. Show your work. Every journal entry must balance. Answer concept questions and the essay in complete sentences. The test is worth 100 points.

1. **6 pts**

Journalize: sold goods for \$4,000 on account, terms 2/10, n/30; the customer pays within 10 days.

2. **4 pts**

Journalize a \$1,200 card sale with a 3% fee.

3. **4 pts**

Gross sales \$320,000; returns \$9,000; discounts \$5,000. Net sales?

4. **5 pts**
Credit sales \$600,000; estimated loss rate 1.2%. Journalize the bad-debt adjustment (percent of sales).
5. **8 pts**
Aging: current \$50,000 at 1%; 31–60 days \$10,000 at 5%; 61–90 days \$4,000 at 20%; over 90 days \$2,000 at 50%. The allowance has a \$600 credit balance. Find the required allowance, the adjustment, and net realizable value.
6. **5 pts**
Journalize writing off a \$900 account, then its later recovery and collection.
7. **4 pts**
Why does a write-off under the allowance method not change net income?
8. **6 pts**
Perpetual: buy \$8,000 of goods on account; sell goods costing \$2,700 for \$4,500 cash. Journalize.
9. **6 pts**
Periodic: beginning \$15,000; purchases \$62,000; freight-in \$1,800; returns \$2,300; ending \$17,500. COGS?
10. **12 pts**
Beginning 80 units at \$20; purchases 120 at \$22 and 100 at \$25. 210 units sold. Compute ending inventory and COGS under FIFO, LIFO and weighted average.
11. **4 pts**
In Problem 10 prices rose. Which method gives the highest gross profit, and why?
12. **6 pts**
Cost \$15; price \$24. Markup on cost and gross margin? What markup gives a 50% margin?
13. **5 pts**
COGS \$240,000; beginning inventory \$36,000; ending \$44,000. Inventory turnover?

14. **5 pts**

Records show \$56,000 of inventory; a count shows \$54,880. Journalize and give the shrinkage rate.

15. **5 pts**

How did Singer's installment plan and the Medici London branch's loans each show the promise and the danger of receivables?

16. **15 pts**

Essay: A friend opening a small shop asks whether she should sell on credit and which inventory method to use. Write her a letter using at least four ideas from this unit (for example, credit terms, aging, allowance, perpetual records, FIFO or average cost, margins, turnover), with one short numerical example.

ANSWER KEY

1. Dr A/R 4,000, Cr Sales 4,000. Dr Cash 3,920, Dr Sales Discounts 80, Cr A/R 4,000.
2. Dr Cash 1,164; Dr Credit Card Expense 36; Cr Sales 1,200.
3. \$306,000.
4. Dr Bad Debt Expense 7,200; Cr Allowance 7,200.
5. Required $500 + 500 + 800 + 1,000 = 2,800$; adjustment 2,200; A/R 66,000; NRV 63,200.
6. Dr Allowance 900, Cr A/R 900. Reinstate: Dr A/R 900, Cr Allowance 900. Collect: Dr Cash 900, Cr A/R 900.
7. The expense was estimated and recorded earlier; the write-off only removes the specific account from both A/R and the allowance.
8. Dr Inventory 8,000, Cr A/P 8,000. Dr Cash 4,500, Cr Sales 4,500. Dr COGS 2,700, Cr Inventory 2,700.
9. Net purchases 61,500; available 76,500; COGS \$59,000.
10. Available 300 units, \$6,740. Ending 90 units. FIFO ending $90 \times 25 = 2,250$, COGS 4,490. LIFO ending $80 \times 20 + 10 \times 22 = 1,820$, COGS 4,920. Average 22.4667; ending $\approx 2,022$, COGS $\approx 4,718$.
11. FIFO, because the oldest, lowest costs go to COGS.
12. 60%; 37.5%; 100%.
13. $240,000 \div 40,000 = 6$ times.
14. Dr COGS 1,120, Cr Inventory 1,120; 2%.
15. Singer's credit made machines affordable and grew sales enormously, while requiring careful records and collection; the Medici lent to a king who did not repay, and carrying those loans at full value hid losses until they ruined the branch.
16. A strong answer gives sensible, honest advice: extend credit carefully with clear terms and an aging review; estimate bad debts; keep perpetual records but count regularly; choose a cost method and apply it consistently (FIFO or average is common); watch gross margin and turnover; includes a correct small calculation.

PORTFOLIO PIECE: A MERCHANDISER'S QUARTER

Keep the books for a small merchandising business (invented or real with permission) for one quarter: at least 30 transactions including credit sales with discounts, card sales, purchases with freight, returns, a write-off and inventory purchases at changing prices. Use a perpetual system with FIFO or average cost, take a year-end-style count, age the receivables, and prepare the quarter's income statement through net income with gross margin and inventory turnover. Write a one-page analysis comparing what your income would have been under the other cost method.

LOOK FOR	WHAT IT MEANS
Transactions	At least 30 correctly journalized transactions covering credit sales, discounts, purchases, returns and a write-off.
Receivables	Customer ledger agrees with the control account; aging schedule and allowance adjustment correct.
Inventory	Perpetual records correct under the chosen method; shrinkage recorded from a count.
Statements and analysis	Income statement with net sales, COGS, gross margin and turnover; comparison with the other method is accurate and explained.

6.1 ACCOUNTS RECEIVABLE: SINGER SELLS ON CREDIT

OBJECTIVES

- Record credit sales, collections, sales discounts and credit-card sales.
- Keep a subsidiary ledger of customer accounts that agrees with the Accounts Receivable control account.
- Explain how selling on credit helped businesses like Singer grow, and what risks it brings.

Warm-up. Write down one thing your family bought and paid for over time (a car, a phone, furniture). Why would a seller agree to wait for the money? What would the seller need to keep track of?

WATCH

FA22 - Accounts Receivable Explained

Tony Bell · 10:42

<https://www.youtube.com/watch?v=uuJDmY6mA6Q>

WHEN TO WATCH

After the big idea, before the worked examples.

BACKUP VIDEO

Revenue Recognition Principle in TWO MINUTES!

Accounting Stuff · 2:47

<https://www.youtube.com/watch?v=37PPccwsYJI>

With the first core idea, as a reminder of when revenue is recognized.

KEY TERMS

accounts receivable

Amounts customers owe the business for goods or services sold on credit; a current asset.

credit terms

The conditions of a credit sale. “2/10, n/30” means a 2% discount if paid within 10 days; otherwise the full amount is due in 30 days.

sales discount

A reduction in price for early payment, recorded in a contra-revenue account that reduces net sales.

subsidiary ledger

A separate ledger with an account for each customer; its total must equal the Accounts Receivable control account in the general ledger.

installment sale

A sale paid in regular payments over time, often with a down payment.

CORE IDEAS

The story. In the 1850s the sewing machine was one of the most useful machines a family could own, and one of the most expensive: a Singer cost more than many families earned in two or three months. In 1856 I. M. Singer & Co., led by Isaac Singer and his business partner, the lawyer Edward Clark, began selling machines on an installment plan: a modest payment down and the rest in small monthly payments. Clark also offered a trade-in for old machines of any make. Sales soared. By the 1870s Singer was selling hundreds of thousands of machines a year, through its own shops and agents, all over the world.

How they figured it out. Selling on credit made the machine affordable, but it changed the bookkeeping. Every agent had to keep an account for every customer, recording each payment and the balance still owed, and send regular reports to the company. A single customer's missed payments might be small, but tens of thousands of them added up. Singer's great asset was no longer only its factories and inventory; it was the money its customers owed, its **accounts receivable**.

The big idea. A credit sale is recorded when the sale is made: debit Accounts Receivable, credit Sales. A collection debits Cash and credits Accounts Receivable. Many businesses offer **credit terms** such as 2/10, n/30 to encourage quick payment; a discount taken is debited to **Sales Discounts**, a contra-revenue account. Card sales are treated almost like cash, but the card company keeps a fee, recorded as an expense. Each customer has an account in a **subsidiary ledger**; the general ledger's Accounts Receivable is a **control account** whose balance must equal the subsidiary ledger's total.

In business today. Most sales between businesses are on credit, often with terms of 30 days. A wholesale bakery bills its grocery customers; a plumbing supplier bills contractors. Managing receivables well (checking customers' credit before selling, sending bills promptly, following up on late payers) can make the difference between a business that has cash and one that does not. Consumers buy on credit through cards and installment loans, and the same principle holds for families: a purchase on credit is still a debt.

Think it through. Credit is trust extended over time. A seller who extends it wisely serves customers who could not otherwise buy; a buyer who honors it keeps faith with the seller. "The wicked borroweth, and payeth not again" (Psalm 37:21).

PICTURE STUDY



*The Singer Tower, New York City, Unknown photographer (Library of Congress collection), 1908 · Photograph · Library of Congress, Prints and Photographs Division
Image: [Wikimedia Commons](#), public domain*

The Singer Manufacturing Company built this 47-story headquarters on Broadway, finished in 1908. For about a year it was the tallest building in the world, a monument to a company that made a costly machine affordable by selling it on installments.

Look closely

- Find the Singer Tower among the other buildings. How much taller is it?
- Look at the top: the dome and the lantern.
- Look at the older buildings around it.
- Find the street level. How small do the people and carriages look?

Talk about it

1. How did selling sewing machines on credit help pay for a building like this?
2. Which asset on Singer's balance sheet grew as installment sales grew, and what risk came with it?
3. Who gained from installment selling, and what risks did each side take?

PROJECT

A Customer Ledger for a Month

You will keep a subsidiary ledger for five credit customers of a small business for a month and prove it against the control account.

You will need

- Ledger notebook or spreadsheet
- Calculator

Steps

1. Set up Accounts Receivable (control) and five customer accounts: Allen, Baker, Chen, Dorsey, Ellis, each with a beginning balance: 600, 0, 1,150, 300, 0 (control \$2,050).
2. Record these transactions in a general journal and post to both the control account and the customer accounts: Mar 2 sale to Baker \$1,400, 2/10, n/30; Mar 5 Allen pays \$600; Mar 9 sale to Ellis \$850, 2/10, n/30; Mar 11 Baker pays within the discount period; Mar 15 Chen returns \$150 of goods; Mar 18 sale to Allen \$720; Mar 22 Dorsey pays \$300; Mar 25 Ellis pays (after the discount period); Mar 29 sale to Chen \$500.
3. After posting, list each customer's balance and total them.
4. Compare the total with the control account. They should both be \$2,220.
5. Prepare a one-page customer statement for Chen showing the month's activity, as a business would mail it.
6. Write a paragraph: which customers would you watch, and why?

Tips

- Post every receivable entry twice: to the control account and to the customer's account.
- A sales return reduces both Sales (through Sales Returns and Allowances) and the customer's balance.

Check your work

- ☐ Ending balances: Allen 720; Baker 0; Chen 1,500; Dorsey 0; Ellis 0; total \$2,220 = control account.

- ☐ Baker's discount was \$28; cash received \$1,372.
- ☐ My customer statement for Chen is clear and correct.

LEDGER NOTEBOOK

1. Draw the control account and the five customer accounts underneath, with an arrow showing they must agree.
2. Write the meaning of 2/10, n/30 and compute a discount on a \$5,000 invoice.
3. Write Psalm 37:21 and one sentence about credit and trust.

KEY FORMULAS

Net sales = Gross sales – Sales returns and allowances – Sales discounts

Discount = Invoice amount $\times$ discount rate

From history. Edward Clark, Singer's partner, is often credited with the installment plan and the trade-in allowance. The Singer Building in New York, finished in 1908, was briefly the tallest building in the world, a monument to a company built on making a costly machine affordable.

WORKED EXAMPLES

Example 1. On May 3, Valley Supply sells goods for \$2,400 on account, terms 2/10, n/30, to Baker Builders. Baker pays on May 12. Journalize both entries.

Show solution

1. May 3: Debit Accounts Receivable–Baker Builders \$2,400; credit Sales \$2,400.
2. May 12 is within 10 days, so Baker takes the 2% discount: $2,400 \times 0.02 = \$48$;
cash = $2,400 - 48 = \$2,352$.
3. May 12: Debit Cash \$2,352; Debit Sales Discounts \$48; credit Accounts Receivable–Baker Builders \$2,400.

Answer: Cash \$2,352; Sales Discounts \$48; the receivable of \$2,400 is cleared.

Example 2. A shop makes a \$500 sale to a customer who pays with a credit card. The card company charges a 3% fee and deposits the rest. Journalize.

Show solution

1. Fee: $500 \times 0.03 = \$15$. Cash deposited: \$485.
 2. Debit Cash \$485; Debit Credit Card Expense \$15; credit Sales \$500.
-

Answer: Cash \$485; Credit Card Expense \$15; Sales \$500.

Example 3. A subsidiary ledger shows: Adams \$1,250; Brooks \$830; Carter \$2,140; Diaz \$0; Evans \$575. The general ledger Accounts Receivable shows \$4,895. Do they agree? If not, what might be wrong?

Show solution

1. Subsidiary total: $1,250 + 830 + 2,140 + 0 + 575 = \$4,795$.
 2. Difference: $4,895 - 4,795 = \$100$.
 3. A \$100 credit sale may have been posted to the control account but not to a customer's account, or a \$100 collection posted to a customer account but not the control account. Trace each posting for the month.
-

Answer: They differ by \$100; the error must be found before statements are prepared.

PRACTICE

1. Easy What does 2/10, n/30 mean?

Show answer

A 2% discount if paid within 10 days; otherwise the full amount is due within 30 days.

2. Easy Journalize a \$900 sale on account.

Show answer

Debit Accounts Receivable \$900; credit Sales \$900.

3. Easy What kind of account is Sales Discounts?

Show answer

A contra-revenue account (normal debit balance) that reduces net sales.

4. **Medium** A \$3,500 sale with terms 1/15, n/45 is paid on day 12. Cash received?

Show answer

$$3,500 - 35 = \$3,465.$$

5. **Medium** Journalize the payment in Problem 4.

Show answer

Debit Cash \$3,465; debit Sales Discounts \$35; credit Accounts Receivable \$3,500.

6. **Medium** The same customer pays on day 20 instead. Journalize.

Show answer

Debit Cash \$3,500; credit Accounts Receivable \$3,500.

7. **Medium** Card sales of \$1,800 with a 2.5% fee. Journalize.

Show answer

Debit Cash \$1,755; debit Credit Card Expense \$45; credit Sales \$1,800.

8. **Hard** Gross sales \$180,000; sales returns \$4,200; sales discounts \$2,300. Net sales?

Show answer

\$173,500.

9. **Hard** What effective annual rate does a customer earn by taking a 2/10, n/30 discount? (Paying 20 days early saves 2%.)

Show answer

About 2.04% for 20 days; $\times 365/20 \approx 37\%$ a year, so taking the discount is almost always wise if cash is available.

10. **Hard** How did Singer's installment plan change both its sales and its balance sheet?

Show answer

Sales soared because families could afford machines; receivables became a large asset, with the risk that some would not be collected.

11. **Challenge** A customer who owes \$4,000 on terms 2/10, n/30 returns \$500 of goods and then pays the rest within 10 days. Journalize the return and the payment.

Show answer

Return: debit Sales Returns and Allowances \$500; credit A/R \$500. Payment: discount $2\% \times 3,500 = \$70$; debit Cash \$3,430, Sales Discounts \$70; credit A/R \$3,500.

COMMON MISTAKES

- Recording the discount as an expense instead of a contra-revenue.
- Taking the discount after the discount period has passed.
- Posting to the control account but not the customer's account.

Make it a game • Customer Card Ledger. Use index cards as a subsidiary ledger for five pretend customers of Singer's sewing machines. Your parent calls credit sales on terms of 2/10, n/30, then payments and discounts. Update each card and the Accounts Receivable control total. When the cards finally add up to the control account, you win. Find a planted error if they do not.

Scripture. “The wicked borroweth, and payeth not again: but the righteous sheweth mercy, and giveth.” (Psalm 37:21, KJV)

Every account receivable is someone's promise to pay. Keeping such promises is a mark of righteousness, and extending mercy to a struggling debtor is too.

6.2 BAD DEBTS: THE MEDICI AND THE KING

OBJECTIVES

- Explain why the allowance method matches bad-debt expense to the period of the sale.
- Estimate bad debts by the percent-of-sales method and by aging the receivables.
- Record write-offs and recoveries, and compute net realizable value.

Warm-up. If you lent five friends \$10 each, how many would you expect to repay? Would you count the full \$50 as “money I have”? Write how much you would honestly expect to get back, and why.

WATCH

Percentage-of-Sales Method for estimating Bad Debt Expense

Edspira • 5:45

<https://www.youtube.com/watch?v=ZjkbN4ofu10>

WHEN TO WATCH

After the big idea, before the percent-of-sales example.

BACKUP VIDEO

FA23 – Writing Off Bad Debts - Accounts Receivable, Allowance Method Example

Tony Bell • 2:42

<https://www.youtube.com/watch?v=KUHXp-AI7RI>

Before Worked Example 3, on writing off an account.

KEY TERMS

bad debt (uncollectible account)

A receivable that will not be collected.

allowance method

Estimating uncollectible accounts at the end of each period and recording the expense then, with a credit to Allowance for Doubtful Accounts.

Allowance for Doubtful Accounts

A contra-asset account that reduces Accounts Receivable to the amount expected to be collected.

net realizable value

Accounts receivable minus the allowance: what the business expects to collect.

aging schedule

A table that sorts receivables by how long they have been unpaid, with a higher estimated loss rate for older amounts.

direct write-off method

Recording bad-debt expense only when a specific account is written off; simple, but not allowed under GAAP when bad debts are significant.

CORE IDEAS

The story. The Medici Bank of Florence, founded by Giovanni di Bicci de' Medici in 1397, had branches in Rome, Venice, Geneva, Bruges, London and other cities. Its branch managers were tempted to lend to princes, because princes could grant valuable trading rights. In the 1460s and 1470s the London branch lent heavily to King Edward IV of England, who was fighting the Wars of the Roses and needed money. The king did not repay, and the branch could not collect. The Bruges branch made similar loans to the Duke of Burgundy. The losses were so great that the London branch had to be closed in the 1470s, and they helped bring about the decline of the whole bank, which ended in 1494.

How they figured it out. The Medici books showed these loans as assets for years after there was little hope of collecting them. A balance sheet that counts every receivable at full value tells a happier story than the truth. Modern accounting answers with the **allowance method**: at the end of each period, estimate how much of the receivables will never be collected, record that much as an expense of the period in which the sales were made, and show receivables at the amount expected to be collected.

The big idea. Two ways to estimate. **Percent of sales** (an income-statement approach): $\text{bad-debt expense} = \text{credit sales} \times \text{an estimated loss rate}$. **Aging the receivables** (a balance-sheet approach): sort receivables by age, apply a higher loss rate to older ones, and adjust the allowance to the required balance. The adjusting entry debits Bad Debt Expense and credits Allowance for Doubtful Accounts. When a specific customer's account is judged uncollectible, it is **written off**: debit the Allowance, credit Accounts Receivable. A write-off changes neither net receivables

nor expense, because the loss was already estimated. If a written-off customer later pays, reinstate the account and record the collection.

In business today. Every lender and every business that sells on credit estimates bad debts. Banks call their allowance a “loan loss reserve,” and how carefully they estimate it is one of the most watched numbers in banking. Underestimating bad debts makes profits look higher for a while and then produces a sudden loss, which is exactly what happened to the Medici.

Who gained? Score the Medici London branch’s royal loans. Financiers: 1, depositors and partners lost heavily. Risk-takers: 1, the family’s wealth and bank declined. Builders: 2, branch managers gained trading rights but lost the branch. Workers: 2, clerks lost their posts when branches closed. Customers: 3, merchants lost a reliable bank. Community: 2, Florence lost part of its greatest bank. A loan that cannot be repaid helps no one in the end.

PICTURE STUDY



King Edward IV, Unknown artist, about 1540 (after an earlier portrait) · Oil on panel · National Portrait Gallery, London

Image: [Wikimedia Commons](#), public domain

Edward IV won the English throne in the Wars of the Roses and borrowed heavily from Italian bankers, including the Medici branch in London, to pay for his wars. This portrait was copied in the sixteenth century from a lost original.

Look closely

- Look at his clothes and jewels. What do they say about his wealth?
- Look at his face. Does he look like a man worried about debts?
- Notice the plain background.
- Compare the portrait with the merchants painted by Holbein.

Talk about it

1. Why would a bank manager find it hard to refuse a loan to a king?
2. How should the London branch have shown the king's unpaid loans in its books?
3. What is the difference between a borrower who cannot pay and one who will not?

PROJECT

Age the Receivables

You will build an aging schedule in a spreadsheet, estimate uncollectible accounts, and record the adjustment and a write-off.

You will need

- Spreadsheet software
- Ledger notebook

Steps

1. Create a list of 15 fictional customers with invoice amounts and invoice dates over the last five months (for example, between \$200 and \$3,000).
2. Set a report date and use a formula to compute each invoice's age in days (report date – invoice date).
3. Sort invoices into age categories: current (0–30 days), 31–60, 61–90, 91–120, over 120.
4. Apply loss rates of 1%, 5%, 15%, 30% and 60% and compute the required allowance.
5. Assume the allowance has a \$250 credit balance before adjustment. Journalize the adjustment.
6. Choose the oldest account and write it off. Journalize the write-off and show that net realizable value does not change.
7. Make a bar chart of receivables by age.
8. Write a memo to the owner: which customers need a phone call this week, and what credit policy you recommend.

Tips

- Use DAYS or simple subtraction of dates; check one result by hand.
- Loss rates should rise with age, because old debts are less likely to be paid.

Check your work

- ☐ Every invoice is placed in exactly one age category.
- ☐ My adjustment brings the allowance to the required balance.

- My write-off entry leaves net realizable value unchanged.

LEDGER NOTEBOOK

1. Draw Accounts Receivable and the Allowance as two T-accounts, and write net realizable value beneath.
2. Copy the aging schedule from Worked Example 2.
3. Write a stakeholder scorecard for the Medici London branch's royal loans.

KEY FORMULAS

Net realizable value = Accounts receivable – Allowance for doubtful accounts

Bad debt expense (% of sales) = Credit sales $\times$ loss rate

From history. Much of what we know about the Medici Bank comes from its surviving ledgers, partnership agreements and letters, studied by the historian Raymond de Roover in *The Rise and Decline of the Medici Bank* (1963). He showed how poor control of the branch managers and loans to rulers undermined the bank.

WORKED EXAMPLES

Example 1. A wholesaler's credit sales for the year are \$400,000. Experience shows 1.5% are never collected. Journalize the year-end adjustment by the percent-of-sales method.

Show solution

1. Bad debt expense = $400,000 \times 0.015 = \$6,000$.
2. Debit Bad Debt Expense \$6,000; credit Allowance for Doubtful Accounts \$6,000.

Answer: Bad Debt Expense \$6,000.

Example 2. Another company ages its \$84,000 of receivables: current \$60,000 (1% uncollectible); 1–30 days past due \$14,000 (4%); 31–60 days \$6,000 (10%); 61–90 days \$2,500 (25%); over 90 days \$1,500 (50%). The Allowance already has a \$900 credit balance. Find the required allowance and journalize the adjustment, then compute net realizable value.

Show solution

1. Estimated uncollectible: $600 + 560 + 600 + 625 + 750 = \$3,135$.
2. The allowance must end at \$3,135; it now has \$900, so the adjustment is $3,135 - 900 = \$2,235$.
3. Debit Bad Debt Expense \$2,235; credit Allowance for Doubtful Accounts \$2,235.
4. Net realizable value = $84,000 - 3,135 = \$80,865$.

Answer: Adjustment \$2,235; allowance \$3,135; net realizable value \$80,865.

Example 3. On February 10, the company writes off Lane Co.'s \$1,200 account. On June 4, Lane unexpectedly pays \$1,200. Journalize both and explain the effect on net receivables.

Show solution

1. Feb 10 write-off: Debit Allowance for Doubtful Accounts \$1,200; credit Accounts Receivable–Lane Co. \$1,200.
2. Net receivables are unchanged: A/R and the allowance both fall by \$1,200.
3. June 4 reinstate: Debit Accounts Receivable–Lane Co. \$1,200; credit Allowance for Doubtful Accounts \$1,200.
4. June 4 collect: Debit Cash \$1,200; credit Accounts Receivable–Lane Co. \$1,200.

Answer: Write-offs and recoveries go through the allowance; no new expense is recorded.

PRACTICE

1. Easy What kind of account is Allowance for Doubtful Accounts?

Show answer

A contra-asset with a normal credit balance.

2. **Easy** Why is the direct write-off method not allowed under GAAP when bad debts are significant?

Show answer

It records the expense in a later period than the sale, violating matching, and overstates receivables meanwhile.

3. **Easy** Credit sales \$250,000; loss rate 2%. Bad debt expense?

Show answer

\$5,000.

4. **Medium** A/R \$60,000; allowance \$2,800. Net realizable value?

Show answer

\$57,200.

5. **Medium** Aging requires an allowance of \$4,100. The allowance has a \$1,300 credit balance. Adjustment?

Show answer

\$2,800.

6. **Medium** Same as Problem 5, but the allowance has a \$400 debit balance (write-offs exceeded the estimate). Adjustment?

Show answer

\$4,500.

7. **Medium** Journalize writing off a \$750 account.

Show answer

Debit Allowance for Doubtful Accounts \$750; credit Accounts Receivable \$750.

8. **Hard** Aging: current \$45,000 at 2%; 1–60 days \$8,000 at 10%; over 60 days \$3,000 at 40%. Required allowance?

Show answer

$900 + 800 + 1,200 = \$2,900.$

9. **Hard** Why did the Medici London branch fail, in accounting terms?

Show answer

Its largest receivables were loans to Edward IV that were not repaid; carried at full value, they overstated assets until the losses could no longer be hidden.

10. **Hard** A company's net income looks steady, but its allowance has fallen from 5% to 2% of receivables while receivables doubled. What might be happening?

Show answer

It may be underestimating bad debts to boost income; a sudden large loss could follow.

11. **Challenge** Using the aging in Worked Example 2, suppose next year all over-90-day accounts (\$1,500) are written off and \$600 of 61–90-day accounts are also written off. What happens to the allowance, and was the estimate reasonable?

Show answer

Write-offs total \$2,100 against a \$3,135 allowance, leaving \$1,035; the estimate covered the actual losses with room to spare for other accounts.

COMMON MISTAKES

- Debiting Bad Debt Expense when writing off an account under the allowance method.
- Forgetting to subtract the existing allowance balance when using the aging method.
- Using the percent-of-sales result as the ending allowance balance instead of as the expense.

Make it a game • Age the Receivables. Your parent lays out eight receivable cards with amounts and ages from current to over 90 days. Assign a collection-loss percentage to each age group, total the Allowance for Doubtful Accounts and journalize it. Then each of you estimates the same allowance by percent of sales, and compares. Explain why the Medici's bad loans hurt them.

6.3 INVENTORY SYSTEMS: FROM THE COUNTING BOOK TO THE BAR CODE

OBJECTIVES

- Distinguish periodic and perpetual inventory systems and record purchases and sales under each.
- Compute cost of goods sold under the periodic system, including freight-in and purchase returns.
- Record inventory shrinkage found by a physical count.

Warm-up. Open your kitchen pantry. How would you know how many cans of soup you have without counting? How would a grocery store with 30,000 different items know?

WATCH

Inventory Systems: Perpetual vs Periodic

Accounting Stuff • 12:39

<https://www.youtube.com/watch?v=tAJ8mRfffJ8>

WHEN TO WATCH

After the big idea.

BACKUP VIDEO

Periodic vs Perpetual Inventory Accounting

Edspira • 8:05

https://www.youtube.com/watch?v=yv4E_d5atd4

Before the practice set.

KEY TERMS

merchandise inventory

Goods a business owns and holds for sale to customers; a current asset.

periodic system

Inventory is counted at the end of the period, and cost of goods sold is computed then: beginning inventory + net purchases – ending inventory.

perpetual system

Inventory and cost of goods sold are updated with every purchase and every sale, so the records always show what should be on hand.

freight-in

Shipping cost paid to bring purchased goods to the business; part of the cost of inventory.

shrinkage

Inventory lost to theft, damage or error: the difference between the perpetual record and the physical count.

CORE IDEAS

The story. In 1859 the Great Atlantic & Pacific Tea Company (A&P) began as a tea shop in New York and grew into a chain of thousands of grocery stores. For most of its history, like every store, it kept track of inventory by counting: clerks walked the aisles with clipboards, and the cost of what had been sold was worked out only after the count. Then, at 8:01 in the morning on June 26, 1974, at Marsh's Supermarket in Troy, Ohio, a cashier passed a ten-pack of Wrigley's Juicy Fruit gum over a scanner, and the first product with a Universal Product Code was rung up by a laser. Within two decades nearly every grocery item carried a bar code.

How they figured it out. Before computers, recording the cost of every single sale was too much work for a store selling thousands of small items, so most stores used the **periodic system**: record purchases as they came in, count what was left at the end of the period, and compute what must have been sold. Businesses selling few, costly items (cars, pianos, Singer machines) could keep a **perpetual** record by hand. The bar code and the computer made perpetual records possible for everything: each scan reduces inventory and records cost of goods sold at once.

The big idea. Perpetual: a purchase debits Inventory; each sale has two entries, one for the sale (debit Cash or A/R, credit Sales) and one for its cost (debit Cost of Goods Sold, credit Inventory). The Inventory account always shows what should be on hand; a physical count reveals **shrinkage**. **Periodic:** purchases are debited to a Purchases account; at period end, $\text{cost of goods sold} = \text{beginning inventory} + \text{net purchases} (\text{purchases} + \text{freight-in} - \text{returns} - \text{purchase discounts}) - \text{ending inventory}$

(from a count). Under either system the shelves must still be counted at least once a year.

In business today. Large retailers use perpetual systems linked to scanners and automatic reordering: when the system shows a product running low, it orders more. Small shops and farm stands often still use periodic methods. Every business still takes physical counts, because records are only as good as the reality they describe. Auditors observe the counts (Lesson 9.3).

Think it through. A perpetual system tells you what *should* be on the shelf; only a count tells you what *is*. The difference is a measure of waste, theft and error, and it is a measure of stewardship too.

PICTURE STUDY



An A&P Store in the 1880s, Unknown photographer, 1880s · Photograph · United States

Image: [Wikimedia Commons](#), public domain

A&P grew from a single tea shop into one of the largest retailers in the world. In the 1880s its stores sold tea, coffee, spices and groceries, and its clerks kept track of stock by hand.

Look closely

- Read the signs. What did the store sell?
- Find the goods in the windows. How were they displayed?
- Find the clerks. What would their jobs have included?
- Look for prices on signs or goods.

Talk about it

1. How would the manager of this store have known how much tea he had sold in a month?
2. Which inventory system would this store have used, and why?
3. What could a bar code have told this manager that a count could not?

PROJECT

Run a Perpetual Inventory and Count It

You will keep a perpetual inventory record for a small stock of items for two weeks, then count it and record shrinkage.

You will need

- A small stock of countable items at home (pantry cans, school supplies, garden pots) or index cards standing for goods
- Spreadsheet or ledger notebook

Steps

1. Choose 6–10 items and give each a cost per unit (from receipts or estimates).
2. Count them and record beginning quantities and costs on an inventory card for each item: Date, In, Out, Balance (units), Unit cost, Balance (\$).
3. For two weeks, record every “purchase” (items added) and every “sale” (items used) on the cards the same day.
4. At the end, compute the perpetual balance for each item and the total.
5. Take a careful physical count without looking at the cards.
6. Compare and compute shrinkage by item and in total; journalize the adjustment.
7. Compute what cost of goods sold would have been under the periodic method (beginning + purchases – ending count) and compare with your perpetual records.
8. Write a paragraph explaining any differences and how a store could reduce them.

Tips

- Ask family members to tell you when they use an item, or the records will drift quickly.
- Count each item twice, ideally with a helper.

Check your work

- ☐ Every item has an inventory card with running balances.

- ☐ My shrinkage entry balances.
- ☐ My periodic COGS plus shrinkage reconciles to my perpetual records.

LEDGER NOTEBOOK

1. Draw a perpetual inventory card with columns In, Out, Balance.
2. Write the periodic COGS formula and fill it in with Worked Example 2's numbers.
3. Sketch a bar code and list three things a scan records.

KEY FORMULAS

Goods available for sale = Beginning inventory + Net purchases

COGS = Goods available for sale – Ending inventory

Net purchases = Purchases + Freight-in – Returns – Discounts

From history. The bar code was first patented in 1952 by Norman Joseph Woodland and Bernard Silver, who drew the first version as a bull's-eye of circles. It took two decades, cheap lasers and computers, and an industry agreement on the Universal Product Code (1973) before it could be used at checkouts.

WORKED EXAMPLES

Example 1. Under a perpetual system, a store buys \$5,000 of goods on account, then sells goods costing \$1,800 for \$3,000 on account. Journalize.

Show solution

1. Purchase: Debit Merchandise Inventory \$5,000; credit Accounts Payable \$5,000.
2. Sale, revenue side: Debit Accounts Receivable \$3,000; credit Sales \$3,000.
3. Sale, cost side: Debit Cost of Goods Sold \$1,800; credit Merchandise Inventory \$1,800.
4. Gross profit on the sale: $3,000 - 1,800 = \$1,200$.

Answer: Inventory rises \$5,000 then falls \$1,800; gross profit \$1,200.

Example 2. Under a periodic system: beginning inventory \$12,000; purchases \$48,000; freight-in \$1,500; purchase returns \$2,000; ending inventory by count \$14,500. Compute cost of goods sold.

Show solution

1. Net purchases = $48,000 + 1,500 - 2,000 = \$47,500$.
 2. Goods available for sale = $12,000 + 47,500 = \$59,500$.
 3. COGS = $59,500 - 14,500 = \$45,000$.
-

Answer: Cost of goods sold \$45,000.

Example 3. A perpetual system shows inventory of \$18,400 at year-end; the physical count finds \$17,950. Journalize the adjustment and compute the shrinkage rate.

Show solution

1. Shrinkage = $18,400 - 17,950 = \$450$.
 2. Debit Cost of Goods Sold \$450; credit Merchandise Inventory \$450.
 3. Shrinkage rate = $450/18,400 \approx 2.4\%$.
-

Answer: Shrinkage \$450, about 2.4% of recorded inventory.

PRACTICE

1. **Easy** When and where was the first bar-coded product scanned at a checkout?

Show answer

June 26, 1974, at Marsh's Supermarket in Troy, Ohio (a pack of Wrigley's Juicy Fruit gum).

2. **Easy** Which system updates inventory with every sale?

Show answer

The perpetual system.

3. **Easy** Why is freight-in added to the cost of inventory?

Show answer

It is part of the cost of getting the goods ready for sale.

4. **Medium** Perpetual: sell goods costing \$640 for \$1,000 cash. Journalize.

Show answer

Debit Cash \$1,000, credit Sales \$1,000; debit COGS \$640, credit Inventory \$640.

5. **Medium** Periodic: beginning \$8,000; purchases \$30,000; ending \$9,500. COGS?

Show answer

\$28,500.

6. **Medium** Periodic: beginning \$20,000; purchases \$75,000; freight-in \$2,200; returns \$3,100; discounts \$900; ending \$22,600. COGS?

Show answer

Net purchases 73,200; available 93,200; COGS \$70,600.

7. **Medium** Records show \$42,000 of inventory; count shows \$41,160. Journalize and give the shrinkage rate.

Show answer

Debit COGS \$840, credit Inventory \$840; 2%.

8. **Hard** Ending inventory was overstated by \$3,000 because a count sheet was added twice. Effect on COGS, gross profit and net income?

Show answer

COGS understated \$3,000; gross profit and net income overstated \$3,000.

9. **Hard** Why did most stores use the periodic system before computers?

Show answer

Recording the cost of each small sale by hand was too much work; counting at period end was cheaper.

10. **Hard** Why does a business with a perpetual system still count inventory?

Show answer

To find shrinkage and errors; records show what should be there, only a count shows what is.

11. **Challenge** A store's sales are \$300,000 and its normal gross margin is 35%. Beginning inventory \$40,000; purchases \$200,000. Estimate ending inventory (the gross profit method, used when a count is impossible, such as after a fire).

Show answer

Estimated COGS = $300,000 \times 0.65 = 195,000$; ending inventory $\approx 40,000 + 200,000 - 195,000 = \$45,000$.

COMMON MISTAKES

- Forgetting the cost-of-goods-sold entry for each sale under the perpetual system.
- Subtracting freight-in instead of adding it.
- Assuming a perpetual system means counts are no longer needed.

Make it a game • Cost of Goods Sold Drill. Your parent calls out beginning inventory, purchases, freight-in, purchase returns and ending inventory for a pretend shop. In thirty seconds, calculate cost of goods sold under the periodic system. After five rounds, explain what a perpetual system would show instead, and what shrinkage means when the count is lower than the books. Beat your own number of correct rounds.

6.4 FIFO, LIFO AND AVERAGE COST

OBJECTIVES

- Compute ending inventory and cost of goods sold under FIFO, LIFO and weighted-average cost.
- Explain how the choice of method affects gross profit, taxes and the balance sheet when prices are rising.
- Explain why the cost-flow method is an assumption and must be disclosed and applied consistently.

Warm-up. At a grocery store, workers put new milk at the back of the shelf and older milk at the front. Why? Now imagine a pile of gravel in a yard where new loads are dumped on top and trucks take from the top. Which gravel leaves first?

WATCH

FA31 - Inventory - FIFO, LIFO, Weighted Average Explained

Tony Bell · 11:59

<https://www.youtube.com/watch?v=askuTuuSfBs>

WHEN TO WATCH

After the worked examples' data are set up; pause and compute each method before the presenter does.

BACKUP VIDEO

FIFO vs. LIFO vs. Weighted Average Cost

Edspira · 6:37

<https://www.youtube.com/watch?v=pGrm501rYWg>

Before the practice set, for a short comparison of the three methods.

KEY TERMS

FIFO (first-in, first-out)

Assumes the oldest goods are sold first; ending inventory consists of the most recent costs.

LIFO (last-in, first-out)

Assumes the newest goods are sold first; ending inventory consists of the oldest costs. Allowed under U.S. GAAP but not under IFRS.

weighted-average cost

Each unit is assigned the average cost of all goods available for sale: $\text{total cost} \div \text{total units}$.

consistency principle

A company should use the same accounting methods from period to period, and disclose any change, so that results can be compared.

specific identification

Tracking the actual cost of each item sold; used for unique, costly items such as cars or jewelry.

CORE IDEAS

The story. On September 11, 1916, Clarence Saunders opened the first Piggly Wiggly store in Memphis, Tennessee, the first true self-service grocery, where customers took goods from the shelves themselves instead of asking a clerk. Self-service made the old grocer's rule more important than ever: put new stock behind the old, so the older goods are sold first and nothing spoils. Physically, almost every grocery sells first-in, first-out.

How they figured it out. But identical goods bought at different prices raise an accounting question: when one can of beans is sold, which cost goes to cost of goods sold, the \$0.80 can bought in March or the \$0.90 can bought in June? For most goods it is impossible and pointless to track each unit, so accountants adopted **cost-flow assumptions**. In the 1930s, when prices had risen in some industries, American businesses won the right under the tax laws of 1938 and 1939 to use **LIFO**, which charges the newest, higher costs to cost of goods sold and lowers taxable income, on the condition that they also use LIFO in their reports to owners (the "LIFO conformity rule").

The big idea. The method is an *assumption about costs*, not about which goods physically leave. **FIFO**: the oldest costs go to cost of goods sold; ending inventory is at the newest costs. **LIFO**: the newest costs go to cost of goods sold; ending inventory is at the oldest costs. **Weighted average**: every unit gets the average cost. When prices are rising, FIFO gives the lowest COGS and highest profit (and taxes); LIFO the highest COGS and lowest profit; average lies between. The total cost of goods available is always split between COGS and ending inventory, whichever method is used.

In business today. Most companies use FIFO or average cost. Some U.S. companies with large, slowly turning inventories in times of rising prices (oil refiners, steel and some retailers) use LIFO for its tax advantage. International standards (IFRS) do not permit LIFO, because its balance-sheet inventory can be decades out of date. Whatever the choice, the notes to the statements must disclose it (Lesson 4.5), and it must be applied consistently.

Think it through. A method that lowers taxes honestly, within the law, is legitimate. Switching methods back and forth to manage reported profit is not; that is why consistency and disclosure are required.

PICTURE STUDY



Inside a Piggly Wiggly Self-Service Grocery Store, Unknown photographer, about 1918–1920 · Photograph · Library of Congress, Prints and Photographs Division
Image: [Wikimedia Commons](#), public domain

Clarence Saunders's stores led customers along aisles past every shelf. Each item carried a price tag, and stock was arranged so the oldest goods were in front.

Look closely

- Find the price tags. Where are they?
- Look at how the cans and boxes are arranged. Which would a customer take first?
- Find the aisles. How does a customer move through the store?
- Count how many kinds of goods you can see on one shelf.

Talk about it

1. If the store bought the same canned peaches at three different prices during the year, which cost should be charged when one can is sold?
2. Why is FIFO usually the physical flow of a grocery store even if it chooses a different cost method?
3. How did self-service change the work of the clerks and the records the store needed?

PROJECT

Three Methods in a Spreadsheet

You will build a spreadsheet that computes FIFO, LIFO and average cost for a product and test how the results change as prices change.

You will need

- Spreadsheet software
- Optional: store flyers or receipts showing a product's price at different times

Steps

1. Choose a product a store might stock (a brand of flour, a tool, a book).
2. Enter a beginning inventory and four purchases during a year with units and unit costs, using rising prices.
3. Enter units sold, and compute units in ending inventory.
4. Compute ending inventory and COGS under FIFO, LIFO and weighted average with formulas.
5. Enter a selling price and compute gross profit and gross margin under each method.
6. Change the purchase prices to falling prices and record how the results change.
7. Make a chart comparing COGS under the three methods for rising and falling prices.
8. Write a paragraph: which method would you choose for this product, and why? What would you disclose?

Tips

- Check that COGS + ending inventory equals goods available under every method.
- FIFO and LIFO in a periodic system need only the ending-units layers; work them out by hand first.

Check your work

- ☐ My three methods each satisfy $\text{COGS} + \text{ending inventory} = \text{goods available}$.
- ☐ My results show FIFO highest profit with rising prices and lowest with falling prices.
- ☐ My recommendation gives a reason and mentions consistency and disclosure.

LEDGER NOTEBOOK

1. Draw inventory as a stack of colored layers (one color per purchase price) and shade what is sold under FIFO and under LIFO.
2. Copy the comparison table from Worked Example 3.
3. Write the consistency principle in your own words.

KEY FORMULAS

$$\text{Average unit cost} = \frac{\text{Cost of goods available for sale}}{\text{Units available for sale}}$$

$$\text{COGS} + \text{Ending inventory} = \text{Cost of goods available for sale}$$

From history. Piggly Wiggly stores spread rapidly, and Saunders patented the self-service store layout in 1917. Shopping carts followed in 1937, invented by Sylvan Goldman of Oklahoma City.

WORKED EXAMPLES

Example 1. Hilltop Hardware's records for a line of cordless drills for the year: beginning inventory 100 units at \$10; March purchase 200 units at \$11; July purchase 150 units at \$12; October purchase 50 units at \$13. It sold 380 drills at \$20 each, so 120 units remain. (Periodic system.) Compute the cost of goods available for sale and ending inventory and COGS under FIFO.

Show solution

1. Goods available: $100 \times 10 + 200 \times 11 + 150 \times 12 + 50 \times 13 = 1,000 + 2,200 + 1,800 + 650 = \$5,650$ for 500 units.
2. FIFO ending inventory (the 120 most recent units): $50 \times 13 + 70 \times 12 = 650 + 840 = \$1,490$.
3. FIFO COGS = $5,650 - 1,490 = \$4,160$.

Answer: FIFO: ending inventory \$1,490; COGS \$4,160.

Example 2. Using the same data, compute ending inventory and COGS under LIFO and weighted average.

Show solution

1. LIFO ending inventory (the 120 oldest units): $100 \times 10 + 20 \times 11 = 1,000 + 220 = \$1,220$. $\text{COGS} = 5,650 - 1,220 = \$4,430$.
 2. Average cost = $5,650 / 500 = 11.30$ per unit.
 3. Average ending inventory = $120 \times 11.30 = \$1,356$. $\text{COGS} = 380 \times 11.30 = \$4,294$.
Check: $1,356 + 4,294 = 5,650$.
-

Answer: LIFO: ending \$1,220, COGS \$4,430. Average: ending \$1,356, COGS \$4,294.

Example 3. Compare gross profit under the three methods (sales $380 \times \$20 = \$7,600$), and the income tax at a 25% rate on gross profit (for illustration).

Show solution

1. FIFO gross profit = $7,600 - 4,160 = \$3,440$; tax 860.
 2. Average gross profit = $7,600 - 4,294 = \$3,306$; tax 826.50.
 3. LIFO gross profit = $7,600 - 4,430 = \$3,170$; tax 792.50.
 4. With rising costs, LIFO shows the lowest profit and tax, FIFO the highest, average in between.
-

Answer: Gross profit: FIFO \$3,440; average \$3,306; LIFO \$3,170.

PRACTICE

1. Easy Under FIFO, which costs remain in ending inventory?

Show answer

The most recent costs.

2. Easy Which method is not permitted under IFRS?

Show answer

LIFO.

3. Easy Who opened the first self-service grocery, and when?

Show answer

Clarence Saunders, Piggly Wiggly, Memphis, September 1916.

4. Medium Beginning 40 units at \$5; purchase 60 at \$6. 70 sold. FIFO ending inventory and COGS?

Show answer

Ending $30 \times 6 = \$180$; COGS $40 \times 5 + 30 \times 6 = \$380$.

5. Medium Same data, LIFO.

Show answer

Ending $30 \times 5 = \$150$; COGS $60 \times 6 + 10 \times 5 = \$410$.

6. Medium Same data, weighted average.

Show answer

Average $560 \div 100 = \$5.60$; ending \$168; COGS \$392.

7. Medium When prices are rising, which method gives the highest net income? The highest ending inventory?

Show answer

FIFO for both.

8. Hard When prices are falling, which method gives the lowest COGS?

Show answer

LIFO (the newest, lower costs are charged to COGS).

9. Hard What is the LIFO conformity rule, and why does it exist?

Show answer

A company using LIFO for taxes must also use it in its financial reports; it keeps companies from reporting high profits to owners while reporting low profits to the tax authorities.

10. **Hard** Beginning 200 at \$8; purchases 300 at \$9 and 100 at \$11. 450 sold. Compute FIFO and LIFO COGS.

Show answer

Available 600 units, \$5,400. FIFO ending 150: $100 \times 11 + 50 \times 9 = 1,550$; COGS 3,850. LIFO ending $150 \times 8 = 1,200$; COGS 4,200.

11. **Challenge** A company switches from FIFO to LIFO in a year of rising prices and reports lower profit. Must it disclose this? Why?

Show answer

Yes. The consistency principle requires disclosure of a change in method and its effect, so readers can compare years fairly.

COMMON MISTAKES

- Thinking FIFO or LIFO must match the physical flow of goods.
- Using units sold instead of units in ending inventory when computing ending inventory.
- Forgetting that the three methods always split the same total cost of goods available.

Make it a game • Cost Layers Showdown. Stack paper chips in three piles, labeled with purchase costs of 4, 5 and 6 dollars each. Your parent says how many units were sold. Compute cost of goods sold and ending inventory under FIFO, LIFO and weighted average. Compare gross profit across methods and explain which method gives the lowest taxes when prices are rising.

6.5 COST OF GOODS SOLD AND GROSS MARGIN: WOOLWORTH'S FIVE AND TEN

OBJECTIVES

- Prepare the sales and cost of goods sold sections of a merchandiser's income statement, including returns and discounts.
- Compute gross margin and markup and convert between them.
- Explain how Frank Woolworth's low prices and high volume depended on careful control of cost of goods sold.

Warm-up. A store buys a toy for \$6 and sells it for \$10. Is its profit 40% or about 67%? Write both calculations and explain what each percent is "of."

WATCH

INVENTORY & COST OF GOODS SOLD

Accounting Stuff · 10:11

<https://www.youtube.com/watch?v=OB6RDzqvNbk>

WHEN TO WATCH

After the big idea.

BACKUP VIDEO

GROSS PROFIT MARGIN: a Simple Explanation

Accounting Stuff · 7:50

<https://www.youtube.com/watch?v=jS7jbz1UWuA>

Before the worked examples on gross margin.

KEY TERMS

net sales

Gross sales minus sales returns and allowances and sales discounts.

markup

The amount added to cost to set a price, usually stated as a percent of cost.

gross margin (gross profit rate)

Gross profit as a percent of net sales:
 $(\text{net sales} - \text{COGS}) \div \text{net sales}$.

inventory turnover

Cost of goods sold $\div$ average inventory:
 how many times a year inventory is sold and replaced.

CORE IDEAS

The story. Frank W. Woolworth was a farm boy who became a clerk in a dry-goods store in Watertown, New York. He noticed that a table of odds and ends priced at five cents sold out quickly. In February 1879 he opened his own “Great Five Cent Store” in Utica, New York. It failed within a few months. In June 1879 he tried again in Lancaster, Pennsylvania, adding ten-cent goods, and this time it succeeded. Woolworth’s chain grew to more than a thousand stores, and in 1913 the company paid in cash for the Woolworth Building in New York, then the tallest building in the world.

How they figured it out. A store that sells everything for five or ten cents cannot raise its prices when costs go up. Woolworth’s profit therefore depended entirely on buying cheaply and selling in great volume. He bought directly from manufacturers in huge quantities, often traveling to Europe to buy, and he watched the gross margin on every line of goods. If an item could not be bought cheaply enough to leave a margin at five or ten cents, he stopped selling it.

The big idea. A merchandiser’s income statement begins: **gross sales** – sales returns and allowances – sales discounts = **net sales**; net sales – **cost of goods sold** = **gross profit**. The **gross margin** is gross profit $\div$ net sales. Retailers often set prices by **markup** on cost. The two are related: a markup of m on cost gives a margin of $\frac{m}{1+m}$, and a margin of g requires a markup of $\frac{g}{1-g}$. Gross profit must cover all operating expenses before any net income remains.

In business today. Discount stores and warehouse clubs run on low margins and very high volume and fast **inventory turnover**; jewelers and furniture stores run on high margins and slower turnover. Both can succeed. What fails is a store that does not know its margins, or that prices by guess. Managers watch the gross margin month by month: a falling margin warns of rising costs, too many markdowns, or shrinkage.

Think it through. Woolworth’s first store failed and his second succeeded. His records from the first taught him what to change. Failure, honestly measured, is a teacher.

PICTURE STUDY



A Woolworth Five-and-Ten-Cent Store by Night, at Christmas, Unknown (postcard), 1910s · Postcard · New Albany, Indiana

Image: [Wikimedia Commons](#), public domain

Woolworth's red-fronted stores were in nearly every American town by the 1910s. Christmas was their busiest season, when the stores sold toys, ornaments and small gifts at five and ten cents.

Look closely

- Find the long counters. How are the goods arranged?
- Find the decorations hanging from the ceiling.
- Find the caption at the bottom of the card.
- Why would the store stay open and lit at night in December?

Talk about it

1. How could a store selling at five and ten cents make enough money to build the world's tallest building?
2. Why does the Christmas season matter so much for a store's inventory and gross margin?
3. Who gained from Woolworth's low prices? Did anyone lose?

PROJECT

Price Survey and Margin Analysis

You will survey the prices of the same items at different kinds of stores and estimate their markups and margins.

You will need

- Store flyers, receipts or a parent-supervised visit to two or three stores
- Spreadsheet

Steps

1. Choose eight items commonly sold in different kinds of stores (a gallon of milk, a hammer, a notebook, batteries).
2. Record each item's price at two or three stores (a discount store, a convenience store, a specialty store).
3. Assume the wholesale cost of each item is 60% of the lowest price you found. Compute each store's markup on cost and gross margin.
4. Compute the average gross margin for each store.
5. Estimate, from what you observed, which store probably has the fastest inventory turnover.
6. Prepare a short table and chart comparing the stores.
7. Write a page explaining why different stores charge different prices for the same thing, using margin, turnover and service, and what each store offers its customers in return.

Tips

- Compare exactly the same product and size.
- Do not photograph store shelves without permission; write prices down.

Check your work

- ☐ My table shows prices, markups and margins for eight items at two or three stores.
- ☐ My markup and margin calculations agree with the conversion formula.
- ☐ My explanation uses at least three ideas from this lesson.

LEDGER NOTEBOOK

1. Draw the top of a merchandiser's income statement from gross sales to gross profit.
2. Write the markup–margin conversion formulas and one example of each.
3. Copy the five-and-ten example from Worked Example 3.

KEY FORMULAS

$$\begin{aligned}\text{Gross margin} &= \frac{\text{Net sales} - \text{COGS}}{\text{Net sales}} \\ \text{Markup on cost} &= \frac{\text{Price} - \text{Cost}}{\text{Cost}} \\ g &= \frac{m}{1 + m}, \quad m = \frac{g}{1 - g} \\ \text{Inventory turnover} &= \frac{\text{COGS}}{\text{Average inventory}}\end{aligned}$$

From history. The Woolworth Building, designed by Cass Gilbert and opened in 1913, was paid for in cash, about \$13.5 million, without a mortgage. It held the title of world's tallest building until 1930.

WORKED EXAMPLES

Example 1. A variety store reports gross sales \$250,000; sales returns and allowances \$6,000; sales discounts \$4,000; cost of goods sold \$156,000. Prepare the top of the income statement and compute the gross margin.

Show solution

1. Net sales = 250,000 – 6,000 – 4,000 = \$240,000.
2. Gross profit = 240,000 – 156,000 = \$84,000.
3. Gross margin = 84,000/240,000 = 0.35 = 35%.

Answer: Net sales \$240,000; gross profit \$84,000; gross margin 35%.

Example 2. A store buys an item for \$6.50 and sells it for \$10. Compute the markup on cost and the gross margin, and verify the conversion formula.

Show solution

1. Markup on cost = $(10 - 6.50) \div 6.50 = 3.50 \div 6.50 \approx 53.8\%$.
2. Gross margin = $3.50 \div 10 = 35\%$.
3. Check: $0.538/1.538 \approx 0.35$.

Answer: Markup 53.8% on cost; gross margin 35%.

Example 3. A five-and-ten store sells an item for 10¢. It wants a gross margin of 40%. What is the most it can pay for the item? If its supplier raises the cost to 7¢, what happens to its margin?

Show solution

1. Maximum cost = price $\times$ (1 – margin) = $10 \times 0.60 = 6\text{¢}$.
2. At 7¢: margin = $(10 - 7) \div 10 = 30\%$.
3. With a fixed price, a 1¢ rise in cost cuts the margin by 10 percentage points; the store must find a cheaper source, sell more volume, or drop the item.

Answer: At most 6¢; at 7¢ the margin falls to 30%.

PRACTICE

1. Easy Gross sales \$90,000; returns \$2,500; discounts \$1,500. Net sales?

Show answer

\$86,000.

2. Easy Net sales \$86,000; COGS \$55,900. Gross profit and gross margin?

Show answer

\$30,100; 35%.

3. Easy Where did Woolworth's first store fail, and where did his second succeed?

Show answer

Utica, New York (February 1879); Lancaster, Pennsylvania (June 1879).

4. **Medium** Cost \$40; price \$60. Markup on cost and gross margin?

Show answer

50%; 33.3%.

5. **Medium** A 25% markup on cost gives what gross margin?

Show answer

$0.25 \div 1.25 = 20\%$.

6. **Medium** To earn a 40% gross margin, what markup on cost is needed?

Show answer

$0.40 \div 0.60 \approx 66.7\%$.

7. **Medium** COGS \$180,000; beginning inventory \$28,000; ending \$32,000.

Inventory turnover?

Show answer

Average 30,000; turnover 6 times.

8. **Hard** A store's gross margin fell from 38% to 33% on net sales of \$500,000. How much gross profit was lost compared with last year's margin?

Show answer

$0.05 \times 500,000 = \$25,000$.

9. **Hard** Operating expenses are \$72,000 and the gross margin is 30%. What net sales are needed to break even?

Show answer

$72,000 \div 0.30 = \$240,000$.

10. **Hard** Why could Woolworth not respond to rising costs by raising prices, and what did he do instead?

Show answer

His fixed five- and ten-cent prices were the heart of the store; he bought in huge volume directly from makers, dropped items without margin, and relied on fast turnover.

11. **Challenge** Store A: margin 20%, turnover 12 times, average inventory \$50,000. Store B: margin 45%, turnover 3, average inventory \$80,000. Which earns more gross profit per year?

Show answer

A: COGS 600,000, sales 750,000, gross profit 150,000. B: COGS 240,000, sales $\approx$ 436,364, gross profit $\approx$ 196,364. B earns more gross profit, though A turns its inventory much faster.

COMMON MISTAKES

- Confusing markup on cost with gross margin on sales.
- Computing gross margin on gross sales instead of net sales.
- Forgetting that gross profit must still pay all operating expenses.

Make it a game • Markup Margin Conversion Duel. Your parent names a cost and a selling price, such as Woolworth's five-and-ten pricing. You have twenty seconds to compute the markup on cost and the gross margin on sales, then convert between them. Add a return and a discount to net sales and recompute. Score a point for each correct pair. First to eight points wins.

UNIT 6

RECEIVABLES AND INVENTORY

Most businesses sell on credit and most stores hold inventory, so receivables and inventory are often the two largest current assets on a balance sheet. This unit begins with Singer's installment plan, which made the sewing machine affordable for millions of families and turned customers' promises into the company's biggest asset, and with the Medici Bank's London branch, ruined in part by loans to a king who did not repay. You will learn to record credit sales and discounts, keep a customer ledger, and estimate bad debts with the allowance method.

Then you will follow inventory from the grocer's clipboard to the first bar-code scan in Troy, Ohio, in 1974; compare the periodic and perpetual systems; compute cost of goods sold under FIFO, LIFO and average cost; and see how Frank Woolworth built a chain of five-and-ten-cent stores by watching his gross margin on every item.

PREREQUISITES

- The income statement and balance sheet (Unit 4)
- Adjusting entries (Unit 3)
- Percents and weighted averages

MASTERY CHECKLIST

- ☐ I can record credit sales, discounts, card sales and collections, and reconcile a customer ledger.
- ☐ I can estimate bad debts by percent of sales and by aging, and record write-offs and recoveries.
- ☐ I can record inventory transactions under the perpetual and periodic systems and compute COGS.
- ☐ I can compute ending inventory and COGS under FIFO, LIFO and weighted average, and explain their effects.
- ☐ I can compute gross margin, markup and inventory turnover and explain what they show.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Principles of Accounting, Volume 1 (OpenStax), Chapters 6, 9 and 10:** Free. Merchandising transactions, receivables and inventory, with more practice problems.
- **LibreOffice Calc:** Free spreadsheet software for the aging schedule and the three-method inventory projects.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

6.1 Accounts Receivable: Singer Sells on Credit

3 sessions of 50 minutes

6.2 Bad Debts: The Medici and the King

3 sessions of 50 minutes

6.3 Inventory Systems: From the Counting Book to the Bar Code

3 sessions of 50 minutes

6.4 FIFO, LIFO and Average Cost

3 sessions of 50 minutes

6.5 Cost of Goods Sold and Gross Margin: Woolworth's Five and Ten

3 sessions of 50 minutes

UNIT 6 TEST

Calculators are allowed. Show your work. Every journal entry must balance. Answer concept questions and the essay in complete sentences. The test is worth 100 points.

1. **6 pts**

Journalize: sold goods for \$4,000 on account, terms 2/10, n/30; the customer pays within 10 days.

2. **4 pts**

Journalize a \$1,200 card sale with a 3% fee.

3. **4 pts**

Gross sales \$320,000; returns \$9,000; discounts \$5,000. Net sales?

4. **5 pts**
Credit sales \$600,000; estimated loss rate 1.2%. Journalize the bad-debt adjustment (percent of sales).
5. **8 pts**
Aging: current \$50,000 at 1%; 31–60 days \$10,000 at 5%; 61–90 days \$4,000 at 20%; over 90 days \$2,000 at 50%. The allowance has a \$600 credit balance. Find the required allowance, the adjustment, and net realizable value.
6. **5 pts**
Journalize writing off a \$900 account, then its later recovery and collection.
7. **4 pts**
Why does a write-off under the allowance method not change net income?
8. **6 pts**
Perpetual: buy \$8,000 of goods on account; sell goods costing \$2,700 for \$4,500 cash. Journalize.
9. **6 pts**
Periodic: beginning \$15,000; purchases \$62,000; freight-in \$1,800; returns \$2,300; ending \$17,500. COGS?
10. **12 pts**
Beginning 80 units at \$20; purchases 120 at \$22 and 100 at \$25. 210 units sold. Compute ending inventory and COGS under FIFO, LIFO and weighted average.
11. **4 pts**
In Problem 10 prices rose. Which method gives the highest gross profit, and why?
12. **6 pts**
Cost \$15; price \$24. Markup on cost and gross margin? What markup gives a 50% margin?
13. **5 pts**
COGS \$240,000; beginning inventory \$36,000; ending \$44,000. Inventory turnover?

14. **5 pts**

Records show \$56,000 of inventory; a count shows \$54,880. Journalize and give the shrinkage rate.

15. **5 pts**

How did Singer's installment plan and the Medici London branch's loans each show the promise and the danger of receivables?

16. **15 pts**

Essay: A friend opening a small shop asks whether she should sell on credit and which inventory method to use. Write her a letter using at least four ideas from this unit (for example, credit terms, aging, allowance, perpetual records, FIFO or average cost, margins, turnover), with one short numerical example.

ANSWER KEY

1. Dr A/R 4,000, Cr Sales 4,000. Dr Cash 3,920, Dr Sales Discounts 80, Cr A/R 4,000.
2. Dr Cash 1,164; Dr Credit Card Expense 36; Cr Sales 1,200.
3. \$306,000.
4. Dr Bad Debt Expense 7,200; Cr Allowance 7,200.
5. Required $500 + 500 + 800 + 1,000 = 2,800$; adjustment 2,200; A/R 66,000; NRV 63,200.
6. Dr Allowance 900, Cr A/R 900. Reinstate: Dr A/R 900, Cr Allowance 900. Collect: Dr Cash 900, Cr A/R 900.
7. The expense was estimated and recorded earlier; the write-off only removes the specific account from both A/R and the allowance.
8. Dr Inventory 8,000, Cr A/P 8,000. Dr Cash 4,500, Cr Sales 4,500. Dr COGS 2,700, Cr Inventory 2,700.
9. Net purchases 61,500; available 76,500; COGS \$59,000.
10. Available 300 units, \$6,740. Ending 90 units. FIFO ending $90 \times 25 = 2,250$, COGS 4,490. LIFO ending $80 \times 20 + 10 \times 22 = 1,820$, COGS 4,920. Average 22.4667; ending $\approx 2,022$, COGS $\approx 4,718$.
11. FIFO, because the oldest, lowest costs go to COGS.
12. 60%; 37.5%; 100%.
13. $240,000 \div 40,000 = 6$ times.
14. Dr COGS 1,120, Cr Inventory 1,120; 2%.
15. Singer's credit made machines affordable and grew sales enormously, while requiring careful records and collection; the Medici lent to a king who did not repay, and carrying those loans at full value hid losses until they ruined the branch.
16. A strong answer gives sensible, honest advice: extend credit carefully with clear terms and an aging review; estimate bad debts; keep perpetual records but count regularly; choose a cost method and apply it consistently (FIFO or average is common); watch gross margin and turnover; includes a correct small calculation.

PORTFOLIO PIECE: A MERCHANDISER'S QUARTER

Keep the books for a small merchandising business (invented or real with permission) for one quarter: at least 30 transactions including credit sales with discounts, card sales, purchases with freight, returns, a write-off and inventory purchases at changing prices. Use a perpetual system with FIFO or average cost, take a year-end-style count, age the receivables, and prepare the quarter's income statement through net income with gross margin and inventory turnover. Write a one-page analysis comparing what your income would have been under the other cost method.

LOOK FOR	WHAT IT MEANS
Transactions	At least 30 correctly journalized transactions covering credit sales, discounts, purchases, returns and a write-off.
Receivables	Customer ledger agrees with the control account; aging schedule and allowance adjustment correct.
Inventory	Perpetual records correct under the chosen method; shrinkage recorded from a count.
Statements and analysis	Income statement with net sales, COGS, gross margin and turnover; comparison with the other method is accurate and explained.

LONG-TERM ASSETS AND LIABILITIES

Businesses invest in assets that last for years, and many borrow for years to pay for them. This unit begins with Richard Arkwright's cotton mill at Cromford and Henry Ford's assembly lines, to teach how the cost of plant assets is spread over their useful lives by straight-line, declining-balance and units-of-production depreciation, and how to record their sale.

Then it turns to liabilities: Jakob Fugger's loans to the Emperor Charles V and the arithmetic of notes, interest and installment loans; Ford's \$5 day and the payroll taxes and withholding that every employer now handles; and the railroad bonds of the 1800s, the Panic of 1873, and the modern rule that puts leases on the balance sheet.

PREREQUISITES

- Adjusting entries and accumulated depreciation (Unit 3)
- The balance sheet's current and long-term sections (Unit 4)
- Percents, exponents and spreadsheet formulas

MASTERY CHECKLIST

- ☐ I can determine the cost of a plant asset and compute straight-line, DDB and units-of-production depreciation.
- ☐ I can record the sale or disposal of a plant asset with a gain or loss.
- ☐ I can record notes, accrue interest and build an installment loan amortization schedule.
- ☐ I can compute gross and net pay, employee withholdings and employer payroll taxes, and journalize a payroll.
- ☐ I can record bonds at face, discount or premium, and record a lease at present value.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Principles of Accounting, Volume 1 (OpenStax), Chapters 11–13**: Free. Long-term assets, current liabilities (including payroll) and long-term liabilities, with more exercises.
- **IRS Publication 15 (Circular E), Employer’s Tax Guide**: Free from the Internal Revenue Service. The official guide to withholding and payroll taxes. Skim the table of contents with Lesson 7.4 to see what an employer must handle. Ages 16 and up.
- **IRS Publication 946, How to Depreciate Property**: Free. The tax rules for depreciation, which differ from the financial-statement methods taught here. For students who want to see the tax side.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

7.1 Plant Assets and Straight-Line Depreciation: Arkwright’s Mill

3 sessions of 50 minutes

7.2 Declining-Balance and Units-of-Production Depreciation 3 sessions of 50 minutes

7.3 Notes and Interest: Fugger Lends to an Emperor 3 sessions of 50 minutes

7.4 Payroll and Payroll Taxes: Ford’s \$5 Day 3 sessions of 50 minutes

7.5 Bonds and Leases, Simply 3 sessions of 50 minutes

UNIT 7 TEST

Calculators are allowed. Show your work. Every journal entry must balance. Answer concept questions and the essay in complete sentences. The test is worth 100 points.

1. **5 pts**

A machine’s price is \$36,000; freight \$900; installation \$1,100; first-year insurance \$600. What is its cost?

2. (6 pts)

The machine in Problem 1 has a \$3,000 salvage value and 7-year life. Compute annual straight-line depreciation and book value after 3 years.

3. (4 pts)

If the machine was bought on October 1, what is the first year's straight-line depreciation (December year-end)?

4. (8 pts)

Compute DDB depreciation for years 1–3 for an asset costing \$40,000, salvage \$4,000, life 5 years.

5. (5 pts)

A truck costing \$70,000 with salvage \$10,000 is expected to run 300,000 miles. Year 1: 72,000 miles. Depreciation?

6. (6 pts)

Equipment costing \$60,000 with accumulated depreciation \$45,000 is sold for \$12,000. Journalize.

7. (8 pts)

A \$24,000, 9%, 8-month note is signed September 1. Journalize the December 31 accrual and the payment at maturity (May 1).

8. (6 pts)

A \$15,000 loan at 5% is repaid in 2 equal annual payments of about \$8,067.07. Build the schedule.

9. (6 pts)

An employee earns \$24 an hour and works 45 hours. Compute gross pay, Social Security and Medicare withheld.

10. (8 pts)

For Problem 9, federal withholding is \$110, state \$40, and health insurance \$50. Compute net pay and journalize the payroll.

11. (5 pts)

Compute the employer's payroll taxes on the \$1,140 (FUTA 0.6%, SUTA 2.7%).

12. **6 pts**

Bonds of \$300,000, 7%, 10 years, semiannual interest, are issued at face. Journalize the issue and one interest payment.

13. **5 pts**

Bonds of \$80,000 sell for \$78,000 with 16 interest periods and a 6% stated rate. Interest expense per period (straight-line)?

14. **6 pts**

A 3-year lease requires \$8,000 at the end of each year at 6%. Compute the initial lease liability and the first year's interest.

15. **16 pts**

Essay: Using Fugger's loans to Charles V, Ford's \$5 day and the railroad bonds of the 1870s, explain how long-term obligations, to lenders and to workers, should shape a business's decisions. Include Proverbs 22:7 or Leviticus 19:13.

ANSWER KEY

1. \$38,000 (insurance is an expense).
2. $35,000 \div 7 = \$5,000$; book value $38,000 - 15,000 = \$23,000$.
3. $5,000 \times 3/12 = \$1,250$.
4. Rate 40%: 16,000; 9,600; 5,760 (book value 8,640).
5. Rate \$0.20; \$14,400.
6. Book value 15,000; loss 3,000. Dr Cash 12,000, Accumulated Depreciation 45,000, Loss 3,000; Cr Equipment 60,000.
7. Dec 31: $24,000 \times 0.09 \times 4/12 = 720$; Dr Interest Expense 720, Cr Interest Payable 720. May 1: total interest 1,440; Dr Notes Payable 24,000, Interest Payable 720, Interest Expense 720; Cr Cash 25,440.
8. Year 1: interest 750.00, principal 7,317.07, balance 7,682.93. Year 2: interest 384.15, principal 7,682.93 (payment 8,067.08 with rounding), balance 0.
9. $960 + 5 \times 36 = 1,140$; SS 70.68; Medicare 16.53.
10. Net = $1,140 - 110 - 40 - 70.68 - 16.53 - 50 = 852.79$. Dr Wages Expense 1,140; Cr Federal Income Tax Payable 110, State 40, SS Payable 70.68, Medicare Payable 16.53, Health Insurance Payable 50, Cash 852.79.
11. $70.68 + 16.53 + 6.84 + 30.78 = \$124.83$.
12. Dr Cash 300,000, Cr Bonds Payable 300,000. Dr Interest Expense 10,500, Cr Cash 10,500.
13. Cash 2,400 + discount amortization 125 = \$2,525.
14. PV $\approx 21,384.10$; interest $\approx 1,283.05$.
15. A strong answer explains that loans and bonds bind future cash to fixed payments, that lenders protect themselves with security and that borrowers must plan repayment from real income; that wages are an obligation of justice to be paid fully and on time; that Ford's higher wages rested on productivity; and applies the verse sensibly.

PORTFOLIO PIECE: LONG-TERM PLANNING FOR A SMALL BUSINESS

For a small business (invented or real with permission) that needs a \$40,000 piece of equipment, prepare: the asset's cost and three depreciation schedules with a recommended method; an amortization schedule for a loan to buy it and a lease schedule as an alternative; a weekly payroll register for three employees with the employer's taxes; and a two-page memo to the owner comparing buying with borrowing versus leasing, showing the effect of each on the balance sheet and on cash, and including a note on the business's duty to pay its workers and lenders faithfully.

LOOK FOR	WHAT IT MEANS
Depreciation	Correct cost and three schedules that total cost minus salvage; reasoned recommendation.
Financing	Correct loan amortization and lease present value schedules ending at zero.
Payroll	Accurate gross pay, withholdings, net pay and employer taxes, with balanced entries.
Memo	Clear comparison of buy-and-borrow versus lease, with balance-sheet and cash effects and a thoughtful note on obligations.

7.1 PLANT ASSETS AND STRAIGHT-LINE DEPRECIATION: ARKWRIGHT'S MILL

OBJECTIVES

- Determine the cost of a plant asset, including all costs to get it ready for use.
- Compute straight-line depreciation for full and partial years, and book value.
- Record the disposal of a plant asset with a gain or loss.

Warm-up. A family buys a \$1,200 lawn mower expected to last 8 years. Is the mower an expense of the year it was bought, or of each of the 8 years? Write how you would spread its cost and why.

WATCH

STRAIGHT LINE Method of Depreciation in 3 Steps!

Accounting Stuff • 6:51

<https://www.youtube.com/watch?v=iruD9KTnNc>

WHEN TO WATCH

After the big idea and before the worked examples.

BACKUP VIDEO

Straight Line Depreciation Method

Edspira • 8:17

https://www.youtube.com/watch?v=RHo_3kWaiJo

Before the practice set.

KEY TERMS

plant assets (property, plant and equipment)

Long-lived, tangible assets used in operations: land, buildings, machinery, vehicles, furniture.

capital expenditure

A cost that is recorded as part of an asset because it benefits several periods (purchase price, freight, installation, testing).

depreciation

The allocation of a plant asset's cost, less its salvage value, to expense over its useful life. It is cost allocation, not a measure of market value.

salvage (residual) value

The amount the business expects to receive for an asset at the end of its useful life.

useful life

The period (or number of units) over which the asset is expected to be used.

gain or loss on disposal

The difference between what is received for an asset and its book value when it is sold or scrapped.

CORE IDEAS

The story. In 1771 Richard Arkwright, a barber and wig-maker turned inventor, built a cotton-spinning mill at Cromford in Derbyshire, England, powered by a water wheel and filled with his water frames and carding machines. It was one of the first true factories: a large building full of costly machinery that worked day and night. Arkwright and his partners spent thousands of pounds before a single thread was sold. They had to ask a question merchants had rarely faced: if a machine costs a great sum and lasts many years, how much of its cost belongs to each year's profit?

How they figured it out. Early mill owners often charged the whole cost of a machine to the year it was bought, making that year look terrible and later years look much too good. Others ignored wear entirely, until a worn-out machine had to be replaced and there was no money set aside. Over the 1800s, mill owners, railways and their accountants worked out the idea of **depreciation**: spread the cost of a long-lived asset over the years it is used, so each year bears its share, as the matching principle requires.

The big idea. First find the asset's **cost**: everything needed to get it in place and ready for use (price, freight, installation, testing). Then choose a method. **Straight-line** depreciation charges the same amount each year: $(\text{cost} - \text{salvage value}) \div \text{useful life}$. For an asset bought partway through a year, take the fraction of the year it was used. Each year's entry debits Depreciation Expense and credits Accumulated Depreciation. Book value is cost minus accumulated depreciation. When the asset is sold, remove both its cost and its accumulated depreciation; the difference between cash received and book value is a gain or loss. Land is not depreciated, because it does not wear out.

In business today. Every company depreciates its buildings, machines, vehicles and computers. Depreciation is often one of a company's largest expenses, yet it uses no cash in the year it is recorded (Lesson 4.4). Managers use the accumulated depreciation to see how old their equipment is and to plan replacements. Tax rules have their own depreciation schedules, so many businesses keep two sets of depreciation records: one for the financial statements and one for the tax return, both legal and both disclosed.

Who gained? Arkwright's mills made cotton thread cheaper and better than hand spinning, served customers well and made Arkwright rich. Workers had steady wages, though long hours, and children worked in his mills, as in most mills of the period, a practice the Factory Acts later restricted. The community of Cromford grew around the mill, with housing, a chapel and a market that Arkwright built.

PICTURE STUDY



Sir Richard Arkwright, Joseph Wright of Derby, 1789–1790 · Oil on canvas · Private collection (several versions in British museums)

Image: [Wikimedia Commons](#), public domain

Joseph Wright, who lived near Cromford, painted Arkwright late in life, when he owned mills across Derbyshire and Lancashire and had been knighted for his success.

Look closely

- Look at his size and confident pose. What do they suggest?
- Look at his clothes and posture. What do they say about him?
- Look at his face. What kind of man does Wright show?
- Notice the plain background.

Talk about it

1. Arkwright's spinning machines cost a great deal and lasted many years. How should their cost be spread over those years?
2. Which of Arkwright's assets would be depreciated, and which (his land) would not?
3. Who besides Arkwright depended on his mills earning a profit?

PROJECT

A Depreciation Schedule for a Real Asset

You will build a depreciation schedule for a real long-lived asset your family or a local business owns, and record a sale.

You will need

- Information about one real asset (a car, a lawn tractor, a computer) with a parent's help, or the machine from the worked examples
- Spreadsheet

Steps

1. Choose an asset and find (or estimate) its purchase price, delivery and setup costs, purchase date, expected useful life and salvage value.
2. Compute its cost and annual straight-line depreciation.
3. Build a schedule in a spreadsheet: Year, Depreciation Expense, Accumulated Depreciation, Book Value. Include a partial first year if it was not bought in January.
4. Look up what similar used items sell for today (with a parent). Compare that market price with your book value.
5. Suppose the asset is sold today at that market price. Journalize the sale and compute the gain or loss.
6. Write a paragraph: why book value and market value differ, and why accountants still use book value.

Tips

- Use formulas so changing the useful life updates the whole schedule.
- Do not share the family's private information; round numbers are fine.

Check your work

- ☐ My cost includes all costs to get the asset ready to use.
- ☐ My schedule ends at the salvage value.
- ☐ My sale entry removes both the asset's cost and its accumulated depreciation and balances.

LEDGER NOTEBOOK

1. Draw a line graph of book value over the machine's life under straight-line depreciation.
2. Copy the disposal entry with a gain and with a loss.
3. Write a stakeholder scorecard for Arkwright's Cromford mill.

KEY FORMULAS

$$\text{Annual straight-line depreciation} = \frac{\text{Cost} - \text{Salvage value}}{\text{Useful life (years)}}$$

$$\text{Book value} = \text{Cost} - \text{Accumulated depreciation}$$

$$\text{Gain (loss)} = \text{Cash received} - \text{Book value}$$

From history. Arkwright's Cromford Mills still stand and are part of the Derwent Valley Mills World Heritage Site. Arkwright was knighted in 1786 and died one of the richest commoners in England.

WORKED EXAMPLES

Example 1. On January 1, a mill buys a carding machine for \$48,000, pays \$1,200 to ship it and \$800 to install it. It expects to use the machine for 5 years and sell it then for \$5,000. Find its cost, annual straight-line depreciation, and book value after 3 years.

Show solution

1. $\text{Cost} = 48,000 + 1,200 + 800 = \$50,000.$
2. $\text{Depreciable cost} = 50,000 - 5,000 = \$45,000.$
3. $\text{Annual depreciation} = 45,000 \div 5 = \$9,000.$ Entry each year: Debit Depreciation Expense \$9,000; credit Accumulated Depreciation–Equipment \$9,000.
4. After 3 years: accumulated depreciation 27,000; book value $50,000 - 27,000 = \$23,000.$

Answer: Cost \$50,000; \$9,000 a year; book value \$23,000 after 3 years.

Example 2. If the same machine had been bought on April 1 instead of January 1, what is the first year's depreciation (year ending December 31)?

Show solution

1. Months used in the first year: April through December = 9 months.
 2. Depreciation = $9,000 \times 9/12 = \$6,750$.
-

Answer: \$6,750 for the first year.

Example 3. At the end of year 3 (book value \$23,000), the mill sells the machine for \$25,000 cash. Journalize. What if it had sold for \$20,000?

Show solution

1. Gain = $25,000 - 23,000 = \$2,000$. Debit Cash \$25,000; Debit Accumulated Depreciation–Equipment \$27,000; credit Equipment \$50,000; credit Gain on Sale of Equipment \$2,000.
 2. At \$20,000: loss = $20,000 - 23,000 = -\$3,000$. Debit Cash \$20,000; Debit Accumulated Depreciation–Equipment \$27,000; Debit Loss on Sale of Equipment \$3,000; credit Equipment \$50,000.
-

Answer: Sale at \$25,000: gain \$2,000. Sale at \$20,000: loss \$3,000.

PRACTICE

1. Easy Which of these are part of a machine's cost: price, shipping, installation, a repair after it was dropped by careless workers, first-year insurance?

Show answer

Price, shipping and installation. The careless-damage repair and ongoing insurance are expenses.

2. Easy Why is land not depreciated?

Show answer

It does not wear out or get used up.

3. Easy Cost \$30,000; salvage \$2,000; life 7 years. Annual straight-line depreciation?

Show answer

\$4,000.

4. **Medium** Same asset, bought July 1. First-year depreciation (December year-end)?

Show answer

\$2,000.

5. **Medium** Cost \$84,000; salvage \$6,000; life 6 years. Book value after 4 years?

Show answer

Annual 13,000; accumulated 52,000; book value \$32,000.

6. **Medium** Journalize the sale of equipment costing \$40,000 with accumulated depreciation of \$31,000 for \$7,500 cash.

Show answer

Book value 9,000; loss 1,500. Dr Cash 7,500, Accumulated Depreciation 31,000, Loss 1,500; Cr Equipment 40,000.

7. **Medium** Journalize scrapping fully depreciated equipment that cost \$12,000 with no salvage.

Show answer

Dr Accumulated Depreciation 12,000; Cr Equipment 12,000.

8. **Hard** A building cost \$600,000 including \$150,000 for the land under it. The building has a 40-year life and \$50,000 salvage value. Annual depreciation?

Show answer

Depreciable building cost: $450,000 - 50,000 = 400,000$; $\div 40 = \$10,000$ (land not depreciated).

9. **Hard** Why did charging a whole machine to the year of purchase distort early mill owners' profits?

Show answer

The purchase year showed a huge expense and low profit, while later years that used the machine showed no cost and inflated profit; matching was violated.

10. **Hard** A company's plant assets have cost \$2.4 million and accumulated depreciation of \$2.0 million. What might this tell a lender?

Show answer

The assets are mostly worn out (about 83% depreciated); large replacement spending may be needed soon.

11. **Challenge** After 2 years of straight-line depreciation on a \$50,000 machine (5-year life, \$5,000 salvage), the company decides the machine will last 4 more years with a \$2,000 salvage. What is the new annual depreciation?

Show answer

Book value after 2 years: $50,000 - 18,000 = 32,000$. New annual: $(32,000 - 2,000) \div 4 = \$7,500$.

COMMON MISTAKES

- Depreciating land.
- Forgetting to subtract salvage value.
- Removing only the asset's cost, not its accumulated depreciation, when it is sold.

Make it a game • Asset Appraisal Challenge. Choose a real household asset, such as a bicycle or a laptop. Estimate its cost, salvage value and useful life, then compute straight-line depreciation and the book value at the end of year three. Your parent challenges your estimates like Arkwright's investors would. Write a partial-year example too. Defend your numbers without notes.

7.2 DECLINING-BALANCE AND UNITS-OF-PRODUCTION DEPRECIATION

OBJECTIVES

- Compute double-declining-balance depreciation and stop at salvage value.
- Compute units-of-production depreciation from actual use.
- Compare methods and explain when each best matches an asset's pattern of use.

Warm-up. A new car loses value much faster in its first two years than in its eighth and ninth. A delivery truck wears out by the mile, not by the year. What does each fact suggest about how depreciation should be spread?

WATCH

DOUBLE DECLINING BALANCE Method of Depreciation

Accounting Stuff • 5:59

<https://www.youtube.com/watch?v=M-VzJ51zZoM>

WHEN TO WATCH

After the big idea.

BACKUP VIDEO

FA 37 - Units of Production Depreciation Example

Tony Bell • 4:30

<https://www.youtube.com/watch?v=OmUyb6DjyQE>

Before the units-of-production worked example.

KEY TERMS

double-declining-balance (DDB)

An accelerated method: each year's depreciation is twice the straight-line rate times the asset's book value at the start of the year, never going below salvage value.

accelerated depreciation

Any method that charges more depreciation in early years and less in later years.

units-of-production

Depreciation per unit (cost – salvage) ÷ total expected units, multiplied by the units actually produced or used each year.

straight-line rate

$1 \div \text{useful life}$, as a percent (a 5-year life is 20% a year).

CORE IDEAS

The story. In 1913 Henry Ford’s engineers at the Highland Park plant in Michigan installed the first moving assembly lines, starting with flywheel magnetos. Machines were run hard, two and three shifts, and Ford replaced them quickly whenever a better machine was invented. The railroads before him faced the same problem on a huge scale: locomotives and cars wore out by the mile, and tracks by the ton of freight carried. In 1907 the Interstate Commerce Commission required railroads to account for depreciation on their equipment, so that their reported profits would not hide the cost of wearing out their rolling stock.

How they figured it out. Straight-line depreciation assumes an asset is used up evenly. Many assets are not. Some lose most of their usefulness early: they are most productive when new and become less efficient and more costly to repair, or are replaced by better machines. Others wear out with use, not time: a machine that runs three shifts wears out three times as fast as one that runs one shift. Accountants developed methods to fit each pattern.

The big idea. Double-declining-balance: $\text{rate} = 2 \times (1 \div \text{life})$; each year, $\text{depreciation} = \text{rate} \times \text{beginning book value}$ (ignore salvage in the multiplication, but never depreciate below salvage). **Units-of-production:** $\text{rate per unit} = (\text{cost} - \text{salvage}) \div \text{total expected units}$; each year, $\text{depreciation} = \text{rate} \times \text{units used}$. All methods depreciate the same total over the asset’s life, (cost – salvage); they differ only in timing. Choose the method that best matches how the asset’s benefits are used up, disclose it, and apply it consistently.

In business today. Trucking companies and airlines often depreciate engines by hours or miles. Manufacturers with heavy machinery may use units of production. Many companies use straight-line for their financial statements and an accelerated method for taxes, because U.S. tax law allows faster depreciation, which lowers taxes in early years. The difference is tracked and disclosed.

Think it through. Depreciation is an estimate built on judgments about life and salvage. Honest estimates use real experience with similar assets; changing them to make a bad year look better is a misuse of the method.

PICTURE STUDY



The Magneto Assembly Line at Highland Park, Ford Motor Company photographer, 1913 · Photograph · Highland Park, Michigan

Image: [Wikimedia Commons](#), public domain

This photograph shows Ford's first moving assembly line, for flywheel magnetos, in 1913. Each worker did one step; the parts moved along the bench. The line cut the time to build a magneto from about twenty minutes to about five.

Look closely

- Count the workers along the line.
- Find the parts on the bench. Which way are they moving?
- Look for machines, tools and belts. Which are plant assets?
- Look at the building: windows, columns, light.

Talk about it

1. The line ran long hours. Which depreciation method would best match how its equipment wore out?
2. Ford often replaced machines with better ones before they wore out. How does that affect useful life?
3. What would happen to reported profit if the cost of this line were never depreciated?

PROJECT

Three Methods, One Asset

You will compare the three depreciation methods for one asset in a spreadsheet and recommend a method.

You will need

- Spreadsheet
- Ledger notebook

Steps

1. Choose a business asset (a bakery oven, a delivery van, a printing press) and set its cost, salvage, life in years and total expected units of use.
2. Estimate units used each year (they should not be equal).
3. Build schedules for straight-line, DDB (with a rule that stops at salvage) and units of production.
4. Check that each method totals cost minus salvage.
5. Chart depreciation by year for all three methods on one graph.
6. Assume income before depreciation is the same each year; compute net income under each method.
7. Write a recommendation to the owner: which method best matches the asset's use, and why. Mention consistency and disclosure.

Tips

- For DDB, use $\text{=MIN}(\text{rate} \times \text{beginning book value}, \text{beginning book value} - \text{salvage})$ so it never goes below salvage.
- Units-of-production should end exactly at salvage if total units equal the estimate.

Check your work

- ☐ All three schedules total cost minus salvage.
- ☐ My DDB never goes below salvage.
- ☐ My recommendation is tied to how the asset is actually used.

LEDGER NOTEBOOK

1. Sketch the three depreciation patterns on one graph.
2. Copy the DDB schedule from Worked Example 1.
3. Write one sentence on why depreciation is an estimate.

KEY FORMULAS

$$\text{DDB rate} = \frac{2}{\text{Useful life}}, \quad \text{DDB depreciation} = \text{Rate} \times \text{Beginning book value}$$
$$\text{Units-of-production rate} = \frac{\text{Cost} - \text{Salvage}}{\text{Total expected units}}$$

From history. Ford's Highland Park plant, designed by the architect Albert Kahn and opened in 1910, used huge windows for daylight and was called the "Crystal Palace." Its moving lines cut the time to assemble a Model T chassis from about twelve hours to about an hour and a half.

WORKED EXAMPLES

Example 1. Use double-declining-balance for the \$50,000 machine from Lesson 7.1 (5-year life, \$5,000 salvage). Show each year.

Show solution

1. Rate = $2 \times 20\% = 40\%$.
2. Year 1: $0.40 \times 50,000 = 20,000$; book value 30,000.
3. Year 2: $0.40 \times 30,000 = 12,000$; book value 18,000.
4. Year 3: $0.40 \times 18,000 = 7,200$; book value 10,800.
5. Year 4: $0.40 \times 10,800 = 4,320$; book value 6,480.
6. Year 5: $0.40 \times 6,480 = 2,592$ would take book value below salvage, so depreciate only $6,480 - 5,000 = 1,480$; book value 5,000.
7. Total: $20,000 + 12,000 + 7,200 + 4,320 + 1,480 = \$45,000$, the same as straight-line.

Answer: DDB: \$20,000, \$12,000, \$7,200, \$4,320, \$1,480; total \$45,000.

Example 2. A delivery truck costs \$90,000, has a \$10,000 salvage value and is expected to be driven 400,000 miles. It is driven 85,000 miles in year 1 and 110,000 in year 2. Compute depreciation by units of production.

Show solution

1. Rate = $(90,000 - 10,000) \div 400,000 = \$0.20$ per mile.
 2. Year 1: $85,000 \times 0.20 = \$17,000$.
 3. Year 2: $110,000 \times 0.20 = \$22,000$.
 4. Book value after year 2: $90,000 - 39,000 = \$51,000$.
-

Answer: \$17,000 and \$22,000; book value \$51,000.

Example 3. Compare first-year net income under straight-line (\$9,000) and DDB (\$20,000) for a company whose income before depreciation is \$60,000. Which method gives a higher book value at the end of year 1?

Show solution

1. Straight-line: net income $60,000 - 9,000 = \$51,000$; book value 41,000.
 2. DDB: net income $60,000 - 20,000 = \$40,000$; book value 30,000.
 3. Straight-line shows higher income and higher book value in early years; DDB shows them in later years.
-

Answer: Straight-line: \$51,000 income, \$41,000 book value. DDB: \$40,000 income, \$30,000 book value.

PRACTICE

1. Easy What is the DDB rate for an asset with a 4-year life? An 8-year life?

Show answer

50%; 25%.

2. Easy Do all depreciation methods depreciate the same total amount over the asset's life?

Show answer

Yes: cost minus salvage.

3. **Easy** Why did the ICC require railroads to account for depreciation in 1907?

Show answer

So their reported profits would include the cost of wearing out locomotives and cars instead of hiding it.

4. **Medium** Cost \$20,000; salvage \$2,000; 4-year life. DDB for years 1 and 2?

Show answer

Year 1: 10,000; year 2: 5,000.

5. **Medium** Same asset: DDB for years 3 and 4?

Show answer

Year 3: $0.5 \times 5,000 = 2,500$ (book value 2,500); year 4: only 500 to reach salvage 2,000.

6. **Medium** A machine costs \$66,000, salvage \$6,000, expected output 300,000 units. Year 1 output 72,000 units. Depreciation?

Show answer

Rate \$0.20; \$14,400.

7. **Medium** Which method best fits: (a) a taxi; (b) an office building; (c) a computer that becomes outdated quickly?

Show answer

(a) units of production (miles); (b) straight-line; (c) an accelerated method such as DDB.

8. **Hard** Cost \$45,000; salvage \$5,000; 5 years. Compute DDB for all five years.

Show answer

18,000; 10,800; 6,480; 3,888; 832 (to reach 5,000). Total 40,000.

9. **Hard** Why might a company use straight-line for its reports to owners and an accelerated method for taxes?

Show answer

Straight-line gives an even, fair picture of performance; accelerated tax depreciation is allowed by law and lowers taxes in early years, keeping more cash in the business.

10. **Hard** A truck under units of production (rate \$0.25/mile) is driven only 10,000 miles in a slow year instead of the usual 60,000. Effect on depreciation compared with straight-line?

Show answer

Units-of-production depreciation falls to \$2,500 (from \$15,000 in a normal year), matching the low use; straight-line would charge the same amount regardless.

11. **Challenge** Build a table comparing straight-line, DDB and units of production for an asset costing \$36,000, salvage \$4,000, 4-year life, 160,000 units (40,000; 55,000; 35,000; 30,000 by year).

Show answer

SL: 8,000 each year. DDB: 18,000; 9,000; 4,500; 500. UOP rate 0.20: 8,000; 11,000; 7,000; 6,000. Each totals 32,000.

COMMON MISTAKES

- Subtracting salvage before multiplying in DDB.
- Letting DDB take book value below salvage.
- Thinking the methods produce different totals.

Make it a game • Three Methods Race. Your parent names an asset costing 10,000 with a salvage value of 1,000 and a five-year life. Compute double-declining-balance depreciation for each year, stopping at salvage value, then straight-line for comparison. For units-of-production, roll a die each year to set miles driven. Time the whole table and look for the crossover year.

7.3 NOTES AND INTEREST: FUGGER LENDS TO AN EMPEROR

OBJECTIVES

- Record notes payable and receivable, accrued interest and payment at maturity.
- Compute simple interest using $P \times r \times t$, and prepare an installment loan amortization schedule.
- Explain the risks of borrowing and lending, from Jakob Fugger's loans to Charles V to modern business loans.

Warm-up. If you borrow \$100 from a friend and agree to repay \$105 in six months, what is the interest rate per year? Write your calculation.

WATCH

Journal Entries for Note Issued at Face Value

Edspira • 4:36

<https://www.youtube.com/watch?v=p9GZOEYSGBU>

WHEN TO WATCH

After the big idea and before the worked examples.

KEY TERMS

promissory note

A written promise to pay a stated sum (principal) on a stated date, usually with interest.

principal

The amount borrowed, on which interest is computed.

maturity date

The date the note must be repaid.

simple interest

Interest = principal $\times$ annual rate $\times$ time in years.

amortization schedule

A table showing each loan payment divided into interest and principal, and the balance remaining.

current portion of long-term debt

The principal of a long-term loan due within the next year; shown as a current liability.

CORE IDEAS

The story. In 1519 the Holy Roman Emperor Maximilian died, and seven German princes had to choose his successor. Two candidates, King Charles of Spain and King Francis I of France, competed for their votes, and the princes expected large payments. Jakob Fugger of Augsburg, the banker you met in Lesson 1.4, lent Charles more than half of the roughly 850,000 florins he spent, and Charles was elected as Emperor Charles V. Repayment was slow. In 1523 Fugger wrote the emperor a famous, blunt letter reminding him that he could not have won the imperial crown without Fugger's help, and asking that the money be repaid with interest.

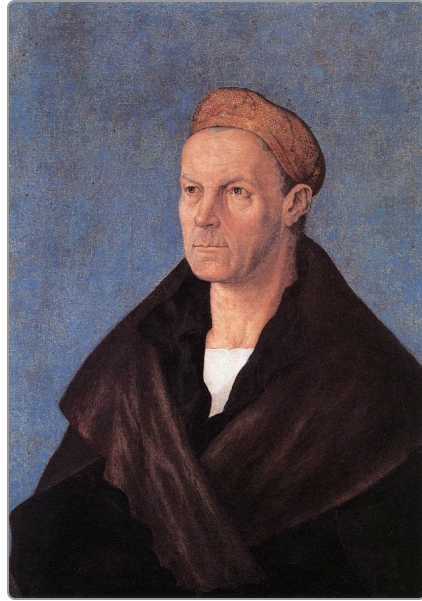
How they figured it out. Lending to rulers was profitable and dangerous: they borrowed large sums and could pay high interest, but no court could force a king to pay. Fugger protected himself by taking security, the income of Spanish silver and mercury mines and lands of the military orders, so he could collect from the source. His accounts recorded each loan, the interest accruing, and the security pledged. The lesson for every lender since: know the borrower, secure the loan, and record what is owed as it grows.

The big idea. A **note payable** is recorded at its principal when signed: debit Cash, credit Notes Payable. Interest = $P \times r \times t$, where t is in years. At the end of each period, accrue interest owed but not yet paid (debit Interest Expense, credit Interest Payable). At maturity, pay principal and interest. A lender records the mirror image: Notes Receivable and Interest Revenue. Many business loans are **installment loans** with equal payments; each payment covers the interest on the balance, and the rest reduces the principal, as shown in an **amortization schedule**.

In business today. Businesses borrow to buy equipment, build stores and smooth out seasonal cash needs. Banks study the borrower's statements, cash flow and security before lending, just as Fugger looked to the mines. On the balance sheet, the part of a loan due within a year is a current liability and the rest is long-term. Borrowing can help a business grow, but every loan must be repaid from future cash flow.

Think it through. "The borrower is servant to the lender" (Proverbs 22:7). Even an emperor found that debt limited his freedom: Charles V's later reign was shaped by his obligations to his bankers. Borrow only for what will repay the cost, and with a clear plan to repay.

PICTURE STUDY



Portrait of Jakob Fugger the Rich, Albrecht Dürer, about 1518–1520 · Oil on canvas (mounted on panel) · Staatsgalerie Altdeutsche Meister, Augsburg
Image: [Wikimedia Commons](#), public domain

Dürer painted Fugger around the time of the contest for the imperial crown in 1519, when Fugger was the most powerful banker in Europe. The plain gold cap he wore became his trademark.

Look closely

- Look at his face and eyes. What kind of man does Dürer show?
- Look at his clothes. Are they showy?
- Notice the background. What does Dürer leave out?
- Compare this with the 1516 picture of Fugger in his counting room (Lesson 1.4).

Talk about it

1. Why would a man who lent to emperors want to be painted so plainly?
2. What did Fugger risk by lending to a ruler no court could force to pay?
3. How does Proverbs 22:7 apply to Charles V and Fugger?

PROJECT

Amortize a Real Loan

You will build an amortization schedule for a realistic loan and compare total interest under different terms.

You will need

- Spreadsheet
- Optionally, a real loan statement shared by a parent (with private details hidden)

Steps

1. Choose a realistic business or family loan: for example, \$25,000 for a delivery van at 7% a year.
2. Compute the annual (or monthly) payment with the formula or the spreadsheet's PMT function, for 3 years and for 5 years.
3. Build a schedule for each: period, beginning balance, payment, interest, principal, ending balance.
4. Check that the last ending balance is zero (within a cent or two of rounding).
5. Compute total interest paid under each term.
6. Write the journal entry for the first payment of the 3-year loan.
7. Show how the loan would appear on a balance sheet at the end of year 1 (current and long-term portions).
8. Write a paragraph: which term would you choose, and what does Proverbs 22:7 suggest about how to think about the decision?

Tips

- For monthly payments use $r/12$ and $n \times 12$.
- PMT returns a negative number in most spreadsheets; that is just the sign convention for a payment.

Check your work

- ☐ Both schedules end at zero.
- ☐ My first-payment entry splits interest and principal correctly.

- My balance sheet presentation splits the current and long-term portions.

LEDGER NOTEBOOK

1. Draw a bar for each payment of a 3-year loan, shaded to show interest shrinking and principal growing.
2. Copy the note entries from Worked Example 1.
3. Write Proverbs 22:7 and a sentence on wise borrowing for a business.

KEY FORMULAS

$$\text{Interest} = P \times r \times t$$

$$\text{Installment payment} = \frac{P \cdot r}{1 - (1 + r)^{-n}}$$

From history. Fugger's letter of 1523 to Charles V survives. Charles did eventually grant him rights to Spanish revenues, and the Fugger firm continued to lend to the Habsburgs for decades, until royal defaults in the later 1500s cost it heavily.

WORKED EXAMPLES

Example 1. On November 1, a company borrows \$12,000 on a 6-month, 8% note. Journalize the borrowing, the December 31 accrual, and payment at maturity on May 1.

Show solution

1. Nov 1: Debit Cash \$12,000; credit Notes Payable \$12,000.
2. Dec 31: interest for 2 months = $12,000 \times 0.08 \times \frac{2}{12} = 160$. Debit Interest Expense \$160; credit Interest Payable \$160.
3. May 1: total interest = $12,000 \times 0.08 \times \frac{6}{12} = 480$; 160 already accrued, 320 for January–April.
4. May 1: Debit Notes Payable \$12,000; Debit Interest Payable \$160; Debit Interest Expense \$320; credit Cash \$12,480.

Answer: Repayment \$12,480: principal \$12,000 and interest \$480 (\$160 last year, \$320 this year).

Example 2. A \$10,000 equipment loan at 6% a year is repaid in 3 equal annual payments. Find the payment and build the amortization schedule.

Show solution

1. $\text{Payment} = \frac{10,000 \times 0.06}{1 - 1.06^{-3}} \approx 3,741.10.$
2. Year 1: interest $10,000 \times 0.06 = 600.00$; principal $3,741.10 - 600.00 = 3,141.10$; balance 6,858.90.
3. Year 2: interest $6,858.90 \times 0.06 = 411.53$; principal 3,329.57; balance 3,529.33.
4. Year 3: interest $3,529.33 \times 0.06 = 211.76$; principal 3,529.33; final payment 3,741.09 (one cent less because of rounding); balance 0.
5. Year 1 payment entry: Debit Notes Payable \$3,141.10; Debit Interest Expense \$600; credit Cash \$3,741.10.

Answer: Payment about \$3,741.10; total interest $600.00 + 411.53 + 211.76 = \$1,223.29.$

Example 3. A bank lends \$50,000 to a farmer on a 9-month, 7% note dated April

1. Record the bank's entries at April 1 and at maturity, January 1 of the next year (ignore the bank's year-end accrual).

Show solution

1. Apr 1: Debit Notes Receivable \$50,000; credit Cash \$50,000.
2. Interest = $50,000 \times 0.07 \times \frac{9}{12} = 2,625.$
3. Jan 1: Debit Cash \$52,625; credit Notes Receivable \$50,000; credit Interest Revenue \$2,625.

Answer: The bank collects \$52,625.

PRACTICE

1. Easy Interest on \$8,000 at 5% for one year?

Show answer

\$400.

2. Easy Interest on \$8,000 at 5% for 3 months?

Show answer

\$100.

3. Easy Journalize borrowing \$15,000 on a note.

Show answer

Debit Cash \$15,000; credit Notes Payable \$15,000.

4. Medium A \$9,000, 6%, 4-month note is signed December 1. Journalize the December 31 accrual.

Show answer

$9,000 \times 0.06 \times 1/12 = 45$. Dr Interest Expense 45; Cr Interest Payable 45.

5. Medium Journalize payment of the note in Problem 4 at maturity (April 1).

Show answer

Total interest 180; Dr Notes Payable 9,000, Interest Payable 45, Interest Expense 135; Cr Cash 9,180.

6. Medium You borrow \$100 and repay \$105 after 6 months. Annual simple interest rate?

Show answer

$5 \div 100 \div 0.5 = 10\%$.

7. Medium A \$40,000 loan requires \$8,000 of principal payments next year. How is it shown on the balance sheet?

Show answer

Current liability \$8,000; long-term liability \$32,000.

8. Hard How did Fugger protect his loans to Charles V?

Show answer

He took security in Spanish revenues (silver and mercury mines, lands of the military orders) so he could collect from the source.

9. **Hard** A \$20,000, 2-year installment loan at 8% has annual payments of about \$11,215.38. Build the schedule.

Show answer

Year 1: interest 1,600.00, principal 9,615.38, balance 10,384.62. Year 2: interest 830.77, principal 10,384.61, balance about 0.

10. **Hard** Why must interest be accrued at year-end even though it is not paid until later?

Show answer

The interest expense was incurred during this year (matching), and the company owes it; omitting it understates expenses and liabilities.

11. **Challenge** A business can buy a \$30,000 machine with a 3-year loan at 7% (annual payments about \$11,431.55) or lease it. If the machine saves \$12,500 a year in labor for 3 years, is borrowing to buy it worthwhile, ignoring taxes?

Show answer

Payments total about 34,294.65; savings total 37,500; the savings exceed the payments by about \$3,205, so the loan is repaid from the savings with something left over (plus the machine's remaining value).

COMMON MISTAKES

- Using the annual rate without multiplying by the fraction of a year.
- Forgetting the interest already accrued when the note is paid.
- Treating the whole loan payment as an expense.

Make it a game • Interest in Your Head. Your parent calls a principal, a rate and a number of months. Give the simple interest, using $P \times r \times t$, within fifteen seconds. After eight rounds, write the first three lines of an amortization schedule for a small loan, showing principal and interest in each payment. Mention how Fugger's loans to an emperor carried interest and risk.

Scripture. "The rich ruleth over the poor, and the borrower is servant to the lender." (Proverbs 22:7, KJV)

Even an emperor found that debt bound him to his banker. A wise business borrows only for what will repay the cost, with a clear plan to repay.

7.4 PAYROLL AND PAYROLL TAXES: FORD'S \$5 DAY

OBJECTIVES

- Compute gross pay, including overtime, and net pay after withholdings.
- Compute the employer's payroll taxes and journalize the payroll and the employer's taxes.
- Explain how Ford's \$5 day, Social Security and income-tax withholding shaped modern payroll accounting.

Warm-up. If you have had a paying job, look at a pay stub (or ask a parent to show you one, with private numbers hidden). List every item between “gross pay” and “net pay.” Which surprised you?

WATCH

Payroll Accounting

Edspira • 6:48

<https://www.youtube.com/watch?v=9yRopn1WWzw>

WHEN TO WATCH

After the big idea and before the worked examples.

KEY TERMS

gross pay

Total earnings before deductions: hours × rate, plus overtime, salary, commissions or bonuses.

FICA taxes

Social Security (6.2% on wages up to an annual limit) and Medicare (1.45% on all wages), paid by both the employee (withheld) and the employer (matched).

net pay

Take-home pay: gross pay minus withholdings and voluntary deductions.

withholding

Income taxes the employer deducts from pay and sends to the government on the employee's behalf.

unemployment taxes (FUTA and SUTA)

Taxes paid by the employer (not withheld from pay) on the first part of each employee's wages, to fund unemployment benefits.

overtime

Under the Fair Labor Standards Act (1938), hourly employees covered by the law must be paid at least 1½ times their regular rate for hours over 40 in a workweek.

CORE IDEAS

The story. On January 5, 1914, the Ford Motor Company announced it would pay most of its workers \$5 for an eight-hour day, about double the usual wage in the industry. The next morning thousands of men crowded the gates of the Highland Park plant. Part of the \$5 was a share of profits paid to workers who met the company's standards. Ford's turnover of workers fell sharply, productivity rose, and the company's profits grew. Ford's payroll office, already huge, had to track every worker's hours, rate, eligibility and pay, week after week.

How they figured it out. Payroll grew more complex as laws were added. The Social Security Act of 1935 created old-age insurance funded by a payroll tax on both workers and employers, collected from 1937. The Fair Labor Standards Act of 1938 set the lowest hourly pay allowed for covered workers and required overtime pay above 40 hours. And in 1943, during the Second World War, Congress required employers to withhold income tax from each paycheck rather than having workers pay once a year. From then on, every employer became a collector of taxes, and payroll accounting a serious responsibility.

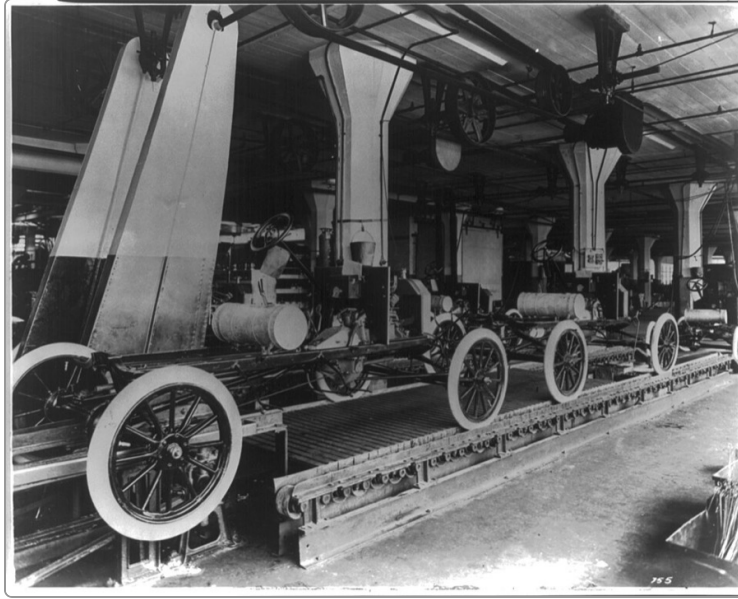
The big idea. **Gross pay** = regular hours × rate + overtime hours × 1.5 × rate. From it the employer withholds federal (and often state) income tax, the employee's Social Security (6.2%) and Medicare (1.45%), and any voluntary deductions such as health insurance. **Net pay** is what is left. The payroll entry debits Wages Expense for gross pay and credits a liability for each withholding and Cash (or Wages Payable) for net pay. The employer also owes its own taxes: a matching 6.2% and 1.45%, plus federal and state unemployment taxes. These are a separate expense: debit Payroll Tax Expense, credit the tax liabilities. Withheld taxes are not the employer's money; they must be sent to the government on time.

In business today. Most businesses use payroll software or a payroll service, but the owner remains responsible. Failing to send in withheld taxes is one of the most

serious mistakes a small business can make, because that money belongs to the employees and the government. Scripture is plain about wages: “the wages of him that is hired shall not abide with thee all night until the morning” (Leviticus 19:13). Paying workers accurately and on time is a matter of justice.

Who gained? Score Ford’s \$5 day. Workers: 5, double pay and shorter hours, though Ford’s “Sociological Department” inspected workers’ homes and habits to decide who qualified, which many resented. Customers: 4, efficient production let the Model T’s price keep falling. Risk-takers: 5, profits rose. Builders: 4, a stable workforce. Financiers: 4. Community: 4, Detroit grew, though the rush of job-seekers strained it. A wage policy can serve every stakeholder when it rests on real productivity.

PICTURE STUDY



Assembly Line at the Ford Motor Company's Highland Park Plant, Unknown photographer, about 1913–1914 · Photograph · Library of Congress, Prints and Photographs Division

Image: [Wikimedia Commons](#), public domain

These were the workers whose pay doubled with the \$5 day in 1914. Every one of them had a time card, an hourly or daily rate and a weekly pay envelope prepared by Ford's payroll clerks.

Look closely

- Find the chassis on the track. Which way are they moving?
- Find the overhead chutes. What might come down them?
- Look for any worker or tool you can see.
- Look at the size of the hall. How many workers might the whole plant have had?

Talk about it

1. What records did the payroll office need for each of these men?
2. Why did doubling wages lower Ford's costs of turnover and training?
3. What does Leviticus 19:13 require of an employer like Ford?

PROJECT

Run a Payroll Register

You will prepare a weekly payroll register for a small business with four employees, journalize it, and compute the employer's taxes.

You will need

- Spreadsheet
- Ledger notebook

Steps

1. Create four employees with hourly rates between \$15 and \$28 and hours worked between 32 and 48 for the week.
2. Compute regular pay, overtime pay and gross pay for each.
3. Assume federal withholding of 10% of gross pay and state withholding of 3% (simplified); compute Social Security (6.2%) and Medicare (1.45%).
4. Add one voluntary deduction for two employees (health insurance \$35 or retirement savings 4%).
5. Compute net pay for each and total every column.
6. Journalize the payroll from the column totals; check that debits equal credits.
7. Compute and journalize the employer's payroll taxes (match FICA, FUTA 0.6%, SUTA 2.7%).
8. Write a paragraph: what does each employee cost the business beyond gross pay, and why must withheld taxes be sent on time?

Tips

- Round each tax to the cent for each employee, then total.
- Real withholding uses IRS tables or software; the 10% here is a teaching simplification.

Check your work

- ☐ Each employee's net pay = gross – deductions.
- ☐ My payroll entry and employer-tax entry balance.

- ☐ I can explain the difference between employee withholdings and employer taxes.

LEDGER NOTEBOOK

1. Draw a pay stub and label gross pay, each deduction and net pay.
2. Make a timeline: 1914 Ford \$5 day; 1935 Social Security Act; 1937 payroll tax collection; 1938 FLSA; 1943 withholding.
3. Write the Ford \$5 day stakeholder scorecard.

KEY FORMULAS

$$\text{Gross pay} = h_{\text{reg}} \times \text{rate} + h_{\text{OT}} \times 1.5 \times \text{rate}$$

$$\text{Net pay} = \text{Gross pay} - \text{Withholdings} - \text{Voluntary deductions}$$

$$\text{FICA} = 6.2\% (\text{Social Security}) + 1.45\% (\text{Medicare})$$

From history. Ford's \$5 day also shortened the shift to eight hours, allowing three shifts a day. Other employers soon raised wages and shortened hours to compete for workers.

WORKED EXAMPLES

Example 1. An employee earns \$22 an hour and works 46 hours in a week. Compute gross pay.

Show solution

1. Regular: $40 \times 22 = \$880$.
2. Overtime: $6 \times 1.5 \times 22 = 6 \times 33 = \$198$.
3. Gross pay = $880 + 198 = \$1,078$.

Answer: Gross pay \$1,078.

Example 2. An employee's gross pay for the week is \$1,000. Withholdings: federal income tax \$82; state income tax \$30; Social Security 6.2%; Medicare 1.45%; health insurance \$40. Compute net pay and journalize the payroll.

Show solution

1. Social Security = $1,000 \times 0.062 = \$62.00$. Medicare = $1,000 \times 0.0145 = \$14.50$.
2. Total deductions = $82 + 30 + 62 + 14.50 + 40 = \$228.50$. Net pay = \$771.50.
3. Debit Wages Expense \$1,000; credit Federal Income Tax Payable \$82; credit State Income Tax Payable \$30; credit Social Security Tax Payable \$62; credit Medicare Tax Payable \$14.50; credit Health Insurance Payable \$40; credit Cash \$771.50.

Answer: Net pay \$771.50.

Example 3. For the same \$1,000 payroll, the employer owes matching Social Security and Medicare, federal unemployment tax of 0.6% and state unemployment tax of 2.7% (the employee has not yet reached the \$7,000 wage limit). Journalize the employer's taxes and find the employer's total cost of this week's pay.

Show solution

1. Social Security \$62.00; Medicare \$14.50; FUTA $1,000 \times 0.006 = \$6.00$; SUTA $1,000 \times 0.027 = \$27.00$. Total \$109.50.
2. Debit Payroll Tax Expense \$109.50; credit Social Security Tax Payable \$62; credit Medicare Tax Payable \$14.50; credit FUTA Payable \$6; credit SUTA Payable \$27.
3. Total cost to employer = $1,000 + 109.50 = \$1,109.50$ (plus any employer share of benefits).

Answer: Employer payroll taxes \$109.50; total cost \$1,109.50.

PRACTICE

1. Easy What did Ford announce on January 5, 1914?

Show answer

A \$5 pay for an eight-hour day for most workers, about double the usual wage.

2. **Easy** Which law required income-tax withholding from paychecks, and when?

Show answer

The Current Tax Payment Act of 1943.

3. **Easy** Gross pay for 40 hours at \$18.50?

Show answer

\$740.

4. **Medium** Gross pay for 44 hours at \$20?

Show answer

$800 + 4 \times 30 = \$920$.

5. **Medium** Social Security and Medicare withheld on \$920?

Show answer

\$57.04 and \$13.34.

6. **Medium** Gross \$920; federal withholding \$68; state \$25; FICA from Problem 5; retirement savings \$46. Net pay?

Show answer

$920 - 68 - 25 - 57.04 - 13.34 - 46 = \$710.62$.

7. **Medium** Why are withheld taxes liabilities, not expenses, of the employer?

Show answer

The money belongs to the employees and the government; the employer only holds it until it is paid over.

8. **Hard** Employer taxes on \$920 of wages with FUTA 0.6% and SUTA 3.0%?

Show answer

$SS\ 57.04 + Medicare\ 13.34 + FUTA\ 5.52 + SUTA\ 27.60 = \$103.50$.

9. **Hard** A business has a weekly payroll of \$18,000 (all below the unemployment wage limits). Using the rates in Worked Example 3, what are its weekly employer payroll taxes?

Show answer

$18,000 \times (0.062 + 0.0145 + 0.006 + 0.027) = 18,000 \times 0.1095 = \$1,971$.

10. **Hard** Apply Leviticus 19:13 to an employer who pays workers late or keeps withheld taxes to cover a cash shortage.

Show answer

Wages and withheld money belong to others; delaying or diverting them wrongs the workers and the government, and is forbidden in Scripture as well as in law.

11. **Challenge** Give a stakeholder scorecard for Ford's \$5 day with a reason for each group, including one honest weakness.

Show answer

Sample: workers 5 (double pay, shorter hours; but home inspections by the Sociological Department); customers 4 (falling prices); owners 5 (higher profits); builders 4 (stable workforce); financiers 4; community 4 (growth, but crowding and strain).

COMMON MISTAKES

- Computing overtime at $1.5 \times$ the rate for all hours instead of hours over 40.
- Treating withheld taxes as the employer's expense.
- Forgetting the employer's matching FICA.

Make it a game • Payday in Five Minutes. Your parent gives hours and an hourly wage for three pretend employees, with Ford's five-dollar day as a model. Calculate gross pay with time and a half after 40 hours, subtract a stated withholding, and use 7.65 percent for employee FICA. Then find the employer's matching tax and journalize one payroll. Finish before the five-minute timer.

Scripture. "Thou shalt not defraud thy neighbour, neither rob him: the wages of him that is hired shall not abide with thee all night until the morning." (Leviticus 19:13, KJV)

Paying workers accurately and on time is a command, not merely a courtesy. Payroll accounting is one of the ways an employer obeys it.

7.5 BONDS AND LEASES, SIMPLY

OBJECTIVES

- Explain what bonds are and record bonds issued at face value, with semiannual interest.
- Record bonds issued at a discount or premium with straight-line amortization.
- Explain how a lease is recorded as a right-of-use asset and a lease liability, and compute the first year's interest.

Warm-up. A town wants to build a \$2 million bridge that will last 50 years. Should today's taxpayers pay for it all at once, or should it be paid over many years by the people who will use it? Write a reason for each side.

WATCH

FA39 – What Are Bonds? - Intro to Liabilities in Accounting

Tony Bell · 11:05

https://www.youtube.com/watch?v=T92po_4bnN4

WHEN TO WATCH

After the story and before the worked examples.

BACKUP VIDEO

Lease Accounting Overview (the new lease rule)

Edspira · 7:16

<https://www.youtube.com/watch?v=X1AMT1hWaM>

Before the lease worked example.

KEY TERMS

bond

A long-term debt security: the issuer borrows a face amount from investors, pays interest (usually every six months) at a stated rate, and repays the face amount at maturity.

face (par) value

The amount repaid at maturity, on which the stated interest is computed.

discount / premium

When bonds sell below face value (discount) or above it (premium) because the market rate is higher or lower than the stated rate.

lease

A contract to use an asset for a period in exchange for payments. Under current U.S. GAAP, most leases longer than a year are recorded as a right-of-use asset and a lease liability.

present value

What a series of future payments is worth today at a given interest rate (Lesson 10.4).

CORE IDEAS

The story. American railroads were built largely with borrowed money. From the 1840s to the 1890s they sold bonds to investors in the eastern cities, Britain and the Netherlands, promising interest every six months and repayment in twenty, thirty or more years. In 1873 the banking house of Jay Cooke & Company, which had sold millions of dollars of Northern Pacific Railroad bonds, could not raise more money to keep building the line. On September 18, 1873, Cooke's firm closed its doors, setting off the Panic of 1873. The railroad's bondholders waited years to be repaid, and many railroads of that era went through bankruptcy and reorganization.

How they figured it out. Bonds let a company borrow from thousands of investors at once, for a long time, at a fixed rate. They are cheaper than giving up ownership, and the interest is fixed no matter how well the business does. But the interest must be paid in bad years as well as good, and the principal must be repaid at maturity. A company that borrows too much, as many railroads did, can be ruined by one bad year.

The big idea. Bonds issued at face: debit Cash, credit Bonds Payable. Each interest date: debit Interest Expense, credit Cash for $\text{face} \times \text{stated rate} \times \frac{1}{2}$. If bonds are sold at a **discount** (below face), the discount is extra interest spread over the bond's life; at a **premium**, the premium reduces interest. (This course uses straight-line amortization; later courses use the more exact effective-interest method.) A **lease** longer than a year is recorded at the present value of its payments: debit Right-of-Use Asset, credit Lease Liability. Each payment covers interest on the liability and reduces the principal, like a loan.

In business today. Corporations, cities, states and the federal government all borrow by issuing bonds. Investors compare bonds' interest rates and the issuer's ability to pay. Since 2019, U.S. GAAP has required most leases to be shown on the balance sheet, so that a company that leases its stores, trucks or airplanes shows those obligations as liabilities, just as if it had borrowed to buy them.

Think it through. The warm-up's bridge shows why long-term borrowing can be wise: an asset that serves for decades can fairly be paid for over decades. The danger is borrowing for things that will not last as long as the debt, or more than future income can repay.

PICTURE STUDY



Jay Cooke, Unknown photographer, published 1892 · Halftone print of a photograph · From a book by S. F. Hotchkin (1892)

Image: [Wikimedia Commons](#), public domain

Jay Cooke of Philadelphia sold government bonds to ordinary citizens during the Civil War and then the bonds of the Northern Pacific Railroad. When his firm failed in 1873, it set off a national panic.

Look closely

- Look at his face and beard. What age is he here?
- Look at his clothes. What do they say about him?
- Notice the dotted texture of a photograph printed in a book.
- Compare this portrait with the portraits of Fugger and the Medici in this course.

Talk about it

1. Why did investors trust Cooke's bonds so readily?
2. What happens to a company that must pay fixed interest when its income falls?
3. What should bondholders have looked for in the railroad's accounts?

PROJECT

A Bond and a Lease in a Spreadsheet

You will build a straight-line bond amortization table and a lease schedule, and compare borrowing with leasing.

You will need

- Spreadsheet

Steps

1. Set up a bond: \$100,000 face, 5 years, 6% stated rate, semiannual interest, sold for \$97,500.
2. Build a table for 10 periods: cash interest, discount amortization, interest expense, unamortized discount, carrying value.
3. Check that the carrying value ends at exactly \$100,000.
4. Set up a lease for a piece of equipment: 4 annual payments of \$12,000 at the end of each year, 6% rate.
5. Compute its present value and build a schedule: beginning liability, interest, payment, principal reduction, ending liability.
6. Check that the liability ends at zero (within rounding).
7. Write a paragraph comparing the total cost of the bond financing and the lease, and what each obligation means for the company's future cash.

Tips

- Use the PV function to check your lease present value.
- Keep cents; round only for display.

Check your work

- ☐ My bond table ends with carrying value \$100,000 and total interest expense \$32,500.
- ☐ My lease present value is about \$41,581.27 and the schedule ends at zero.
- ☐ My comparison explains fixed obligations.

LEDGER NOTEBOOK

1. Draw a timeline of a 10-year bond: issue, 20 interest payments, repayment of face.

2. Copy the discount entries from Worked Example 2.
3. Write two sentences on the Panic of 1873 and the danger of heavy borrowing.

KEY FORMULAS

$$\text{Semiannual interest} = \text{Face} \times \text{Stated rate} \times \frac{1}{2}$$

$$\text{Interest expense per period} = \text{Cash interest} + \frac{\text{Discount}}{\text{Number of periods}}$$

$$PV = \text{Payment} \times \frac{1 - (1 + r)^{-n}}{r}$$

From history. Jay Cooke had earlier sold hundreds of millions of dollars of U.S. government bonds to ordinary citizens during the Civil War, through newspaper advertising and thousands of local agents. His firm's failure in 1873 shocked the country partly because he had been so trusted.

WORKED EXAMPLES

Example 1. On January 1, a company issues \$100,000 of 10-year, 6% bonds at face value, with interest paid June 30 and December 31. Journalize the issue and the first interest payment.

Show solution

1. Jan 1: Debit Cash \$100,000; credit Bonds Payable \$100,000.
2. Semiannual interest = $100,000 \times 0.06 \times \frac{1}{2} = \$3,000$.
3. Jun 30: Debit Interest Expense \$3,000; credit Cash \$3,000.

Answer: Cash interest \$3,000 every six months; \$6,000 a year.

Example 2. Suppose instead the bonds sell for \$98,000 (a \$2,000 discount). Using straight-line amortization over 20 interest periods, journalize the issue and each interest payment.

Show solution

1. Issue: Debit Cash \$98,000; Debit Discount on Bonds Payable \$2,000; credit Bonds Payable \$100,000.
2. Discount amortized per period = $2,000 \div 20 = \$100$.
3. Each interest date: Debit Interest Expense \$3,100; credit Discount on Bonds Payable \$100; credit Cash \$3,000.
4. Over 10 years: cash interest 60,000 + discount 2,000 = total interest expense \$62,000.

Answer: Interest expense \$3,100 each period; the carrying value rises by \$100 each time until it reaches \$100,000.

Example 3. A company leases a delivery van for 3 years with payments of \$10,000 at the end of each year. The interest rate is 5%. Record the lease and the first payment.

Show solution

1. Present value = $10,000 \times \frac{1 - 1.05^{-3}}{0.05} \approx 27,232.48$.
2. Start: Debit Right-of-Use Asset \$27,232.48; credit Lease Liability \$27,232.48.
3. Year 1 interest = $27,232.48 \times 0.05 = \$1,361.62$; principal reduction = $10,000 - 1,361.62 = \$8,638.38$.
4. Payment: Debit Interest Expense \$1,361.62; Debit Lease Liability \$8,638.38; credit Cash \$10,000.
5. Remaining liability: $27,232.48 - 8,638.38 = \$18,594.10$. (The right-of-use asset is also amortized each year, like depreciation.)

Answer: Lease liability \$27,232.48 at the start; \$18,594.10 after the first payment.

PRACTICE

1. Easy What is a bond?

Show answer

A long-term debt security: the issuer borrows face value, pays periodic interest and repays face at maturity.

2. Easy Semiannual interest on \$500,000 of 8% bonds?

Show answer

\$20,000.

3. Easy What set off the Panic of 1873?

Show answer

The failure of Jay Cooke & Company, which could not keep financing the Northern Pacific Railroad with bond sales.

4. Medium Journalize issuing \$200,000 of bonds at face.

Show answer

Debit Cash \$200,000; credit Bonds Payable \$200,000.

5. Medium Bonds with face \$50,000 sell for \$48,800; 5-year term, semiannual interest. Discount amortized per period (straight-line)?

Show answer

$1,200 \div 10 = \$120.$

6. Medium In Problem 5 the stated rate is 7%. Interest expense each period?

Show answer

Cash interest $1,750 + 120 = \$1,870.$

7. Medium Why do bonds sell at a discount?

Show answer

The stated rate is lower than the market rate, so investors pay less to earn the market return.

8. **Hard** Bonds of \$100,000 at 8% sell for \$104,000 (premium) with 20 interest periods. Interest expense each period (straight-line)?

Show answer

Cash interest 4,000 – premium amortization 200 = \$3,800.

9. **Hard** A 4-year lease has payments of \$5,000 at the end of each year at 6%. Present value?

Show answer

$5,000 \times (1 - 1.06^{-4})/0.06 \approx \$17,325.53$.

10. **Hard** Why did GAAP begin requiring most leases on the balance sheet?

Show answer

Lease payments are obligations like debt; leaving them off hid large liabilities from readers.

11. **Challenge** A railroad earns \$900,000 a year before interest in good years and \$300,000 in bad years. It has \$8 million of 6% bonds. Can it pay its interest in a bad year? What does this teach?

Show answer

Interest = 480,000. Good year: yes. Bad year: no; it falls 180,000 short. Fixed interest must be paid in bad years too, so heavy borrowing is dangerous when income varies.

COMMON MISTAKES

- Using the annual rate for a semiannual interest payment.
- Forgetting to amortize a discount or premium.
- Treating the whole lease payment as rent expense under current GAAP.

Make it a game • Bond Entries From Memory. Write on a card: a 1,000-dollar bond with a 6 percent coupon issued at 960 for ten years. From memory, journalize the issue, the first semiannual interest payment and the straight-line discount amortization. Your parent checks your work and asks how the entry changes at a premium. Explain how a lease resembles a bond.

LONG-TERM ASSETS AND LIABILITIES

Businesses invest in assets that last for years, and many borrow for years to pay for them. This unit begins with Richard Arkwright's cotton mill at Cromford and Henry Ford's assembly lines, to teach how the cost of plant assets is spread over their useful lives by straight-line, declining-balance and units-of-production depreciation, and how to record their sale.

Then it turns to liabilities: Jakob Fugger's loans to the Emperor Charles V and the arithmetic of notes, interest and installment loans; Ford's \$5 day and the payroll taxes and withholding that every employer now handles; and the railroad bonds of the 1800s, the Panic of 1873, and the modern rule that puts leases on the balance sheet.

PREREQUISITES

- Adjusting entries and accumulated depreciation (Unit 3)
- The balance sheet's current and long-term sections (Unit 4)
- Percents, exponents and spreadsheet formulas

MASTERY CHECKLIST

- ☐ I can determine the cost of a plant asset and compute straight-line, DDB and units-of-production depreciation.
- ☐ I can record the sale or disposal of a plant asset with a gain or loss.
- ☐ I can record notes, accrue interest and build an installment loan amortization schedule.
- ☐ I can compute gross and net pay, employee withholdings and employer payroll taxes, and journalize a payroll.
- ☐ I can record bonds at face, discount or premium, and record a lease at present value.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Principles of Accounting, Volume 1 (OpenStax), Chapters 11–13**: Free. Long-term assets, current liabilities (including payroll) and long-term liabilities, with more exercises.
- **IRS Publication 15 (Circular E), Employer’s Tax Guide**: Free from the Internal Revenue Service. The official guide to withholding and payroll taxes. Skim the table of contents with Lesson 7.4 to see what an employer must handle. Ages 16 and up.
- **IRS Publication 946, How to Depreciate Property**: Free. The tax rules for depreciation, which differ from the financial-statement methods taught here. For students who want to see the tax side.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

7.1 Plant Assets and Straight-Line Depreciation: Arkwright’s Mill

3 sessions of 50 minutes

7.2 Declining-Balance and Units-of-Production Depreciation

3 sessions of 50 minutes

7.3 Notes and Interest: Fugger Lends to an Emperor

3 sessions of 50 minutes

7.4 Payroll and Payroll Taxes: Ford’s \$5 Day

3 sessions of 50 minutes

7.5 Bonds and Leases, Simply

3 sessions of 50 minutes

UNIT 7 TEST

Calculators are allowed. Show your work. Every journal entry must balance. Answer concept questions and the essay in complete sentences. The test is worth 100 points.

1. **5 pts**

A machine’s price is \$36,000; freight \$900; installation \$1,100; first-year insurance \$600. What is its cost?

2. (6 pts)

The machine in Problem 1 has a \$3,000 salvage value and 7-year life. Compute annual straight-line depreciation and book value after 3 years.

3. (4 pts)

If the machine was bought on October 1, what is the first year's straight-line depreciation (December year-end)?

4. (8 pts)

Compute DDB depreciation for years 1–3 for an asset costing \$40,000, salvage \$4,000, life 5 years.

5. (5 pts)

A truck costing \$70,000 with salvage \$10,000 is expected to run 300,000 miles. Year 1: 72,000 miles. Depreciation?

6. (6 pts)

Equipment costing \$60,000 with accumulated depreciation \$45,000 is sold for \$12,000. Journalize.

7. (8 pts)

A \$24,000, 9%, 8-month note is signed September 1. Journalize the December 31 accrual and the payment at maturity (May 1).

8. (6 pts)

A \$15,000 loan at 5% is repaid in 2 equal annual payments of about \$8,067.07. Build the schedule.

9. (6 pts)

An employee earns \$24 an hour and works 45 hours. Compute gross pay, Social Security and Medicare withheld.

10. (8 pts)

For Problem 9, federal withholding is \$110, state \$40, and health insurance \$50. Compute net pay and journalize the payroll.

11. (5 pts)

Compute the employer's payroll taxes on the \$1,140 (FUTA 0.6%, SUTA 2.7%).

12. **6 pts**

Bonds of \$300,000, 7%, 10 years, semiannual interest, are issued at face. Journalize the issue and one interest payment.

13. **5 pts**

Bonds of \$80,000 sell for \$78,000 with 16 interest periods and a 6% stated rate. Interest expense per period (straight-line)?

14. **6 pts**

A 3-year lease requires \$8,000 at the end of each year at 6%. Compute the initial lease liability and the first year's interest.

15. **16 pts**

Essay: Using Fugger's loans to Charles V, Ford's \$5 day and the railroad bonds of the 1870s, explain how long-term obligations, to lenders and to workers, should shape a business's decisions. Include Proverbs 22:7 or Leviticus 19:13.

ANSWER KEY

1. \$38,000 (insurance is an expense).
2. $35,000 \div 7 = \$5,000$; book value $38,000 - 15,000 = \$23,000$.
3. $5,000 \times 3/12 = \$1,250$.
4. Rate 40%: 16,000; 9,600; 5,760 (book value 8,640).
5. Rate \$0.20; \$14,400.
6. Book value 15,000; loss 3,000. Dr Cash 12,000, Accumulated Depreciation 45,000, Loss 3,000; Cr Equipment 60,000.
7. Dec 31: $24,000 \times 0.09 \times 4/12 = 720$; Dr Interest Expense 720, Cr Interest Payable 720. May 1: total interest 1,440; Dr Notes Payable 24,000, Interest Payable 720, Interest Expense 720; Cr Cash 25,440.
8. Year 1: interest 750.00, principal 7,317.07, balance 7,682.93. Year 2: interest 384.15, principal 7,682.93 (payment 8,067.08 with rounding), balance 0.
9. $960 + 5 \times 36 = 1,140$; SS 70.68; Medicare 16.53.
10. Net = $1,140 - 110 - 40 - 70.68 - 16.53 - 50 = 852.79$. Dr Wages Expense 1,140; Cr Federal Income Tax Payable 110, State 40, SS Payable 70.68, Medicare Payable 16.53, Health Insurance Payable 50, Cash 852.79.
11. $70.68 + 16.53 + 6.84 + 30.78 = \$124.83$.
12. Dr Cash 300,000, Cr Bonds Payable 300,000. Dr Interest Expense 10,500, Cr Cash 10,500.
13. Cash 2,400 + discount amortization 125 = \$2,525.
14. PV $\approx 21,384.10$; interest $\approx 1,283.05$.
15. A strong answer explains that loans and bonds bind future cash to fixed payments, that lenders protect themselves with security and that borrowers must plan repayment from real income; that wages are an obligation of justice to be paid fully and on time; that Ford's higher wages rested on productivity; and applies the verse sensibly.

PORTFOLIO PIECE: LONG-TERM PLANNING FOR A SMALL BUSINESS

For a small business (invented or real with permission) that needs a \$40,000 piece of equipment, prepare: the asset's cost and three depreciation schedules with a recommended method; an amortization schedule for a loan to buy it and a lease schedule as an alternative; a weekly payroll register for three employees with the employer's taxes; and a two-page memo to the owner comparing buying with borrowing versus leasing, showing the effect of each on the balance sheet and on cash, and including a note on the business's duty to pay its workers and lenders faithfully.

LOOK FOR	WHAT IT MEANS
Depreciation	Correct cost and three schedules that total cost minus salvage; reasoned recommendation.
Financing	Correct loan amortization and lease present value schedules ending at zero.
Payroll	Accurate gross pay, withholdings, net pay and employer taxes, with balanced entries.
Memo	Clear comparison of buy-and-borrow versus lease, with balance-sheet and cash effects and a thoughtful note on obligations.

PARTNERSHIPS AND CORPORATIONS

Businesses are owned in different ways, and each form of ownership needs its own accounting. This unit begins with the partnerships of the Medici Bank, whose branch managers shared in the profits under written agreements, and teaches how partnerships record capital and divide income. Then it turns to the corporation, from the Dutch East India Company of 1602, the first company with permanent, freely traded shares, to the corporations of today, and to the stock traded since the Buttonwood Agreement of 1792.

You will issue stock, compute preferred dividends, declare and pay dividends, and prepare a statement of retained earnings, with the famous case of Henry Ford and the Dodge brothers (1919) as a study in whether to pay out profits or reinvest them. The unit ends with nonprofit and church accounting and the example of George Müller, who cared for thousands of orphans without asking anyone for money and published an exact account of every gift.

PREREQUISITES

- The statement of owner's equity and closing entries (Units 3–4)
- Percents and ratios

MASTERY CHECKLIST

- ☐ I can record partners' investments and divide partnership income using salaries, interest and a ratio.
- ☐ I can explain the features of a corporation and present stockholders' equity.
- ☐ I can journalize stock issues and compute cumulative preferred dividends.
- ☐ I can journalize dividends and prepare a statement of retained earnings.
- ☐ I can record restricted and unrestricted contributions and prepare a simple statement of activities.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- ***Principles of Accounting, Volume 1 (OpenStax), Chapters 14–15***: Free. Corporation accounting and partnership accounting, with additional problems.
- ***A Narrative of Some of the Lord's Dealings with George Müller***: Free on Project Gutenberg (four parts). Müller's own account of the orphan work, including the yearly reports of gifts and expenses. Read a few pages with Lesson 8.5. Ages 13 and up.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

8.1 Partnerships: The Medici Model

3 sessions of 50 minutes

8.2 The Corporation: From the Dutch East India Company to Today

3 sessions of 50 minutes

8.3 Stock: Issuing Shares from Buttonwood to Today

3 sessions of 50 minutes

8.4 Dividends and Retained Earnings: Ford versus the Dodge Brothers

3 sessions of 50 minutes

8.5 Nonprofit and Church Accounting: George Müller's Reports

3 sessions of 50 minutes

UNIT 8 TEST

Calculators are allowed. Show your work. Every journal entry must balance. Answer concept questions and the essay in complete sentences. The test is worth 100 points.

1. **5 pts**

Name three differences between a general partnership and a corporation.

2. **5 pts**

Journalize: Kay invests \$30,000 cash and a truck worth \$18,000 in a new partnership.

3. **8 pts**
Partners X and Y: salaries \$20,000 and \$16,000; 10% interest on capitals of \$50,000 and \$30,000; remainder 2:1. Net income \$62,000. Divide it.
4. **6 pts**
Same agreement, net income \$35,000. Divide it.
5. **5 pts**
What made the VOC's capital and shares new in 1602?
6. **6 pts**
Journalize issuing 20,000 shares of \$2 par common at \$12.
7. **5 pts**
Journalize issuing 5,000 shares of \$1 par common for land with a fair value of \$60,000.
8. **8 pts**
6,000 shares of 7%, \$100 par cumulative preferred; dividends one year in arrears; \$100,000 declared this year. Divide between preferred and common.
9. **6 pts**
Journalize declaring a \$0.30 dividend on 300,000 shares, and its payment.
10. **6 pts**
Beginning RE \$310,000; net income \$120,000; dividends \$90,000. Prepare the calculation for the statement of retained earnings.
11. **6 pts**
Prepare total stockholders' equity: common stock \$60,000; APIC \$540,000; retained earnings \$340,000. Book value per share for 60,000 shares?
12. **4 pts**
What did the court decide in Dodge v. Ford (1919)?
13. **6 pts**
A ministry receives \$12,000 restricted for Bibles and spends \$9,000 on Bibles. Journalize the receipt, the expense and the release.

14. **6 pts**

Unrestricted contributions \$150,000; restricted \$30,000; released \$22,000; expenses \$165,000. Change in each class of net assets?

15. **18 pts**

Essay: Compare the Medici partnerships, the VOC and George Müller's orphan work as three ways of organizing money for a purpose. For each, explain how the accounts were meant to protect the people who supplied the money, and where that protection succeeded or failed.

ANSWER KEY

1. Liability (unlimited vs limited); transferability of ownership; life (ends with a partner's departure vs continuous); taxation (partners taxed vs entity and dividends taxed); management (partners vs board and officers).
2. Dr Cash 30,000; Dr Truck 18,000; Cr Kay, Capital 48,000.
3. Salaries 36,000; interest $5,000 + 3,000$; remainder 18,000 split $12,000 / 6,000$. X: 37,000; Y: 25,000.
4. Remainder $35,000 - 44,000 = -9,000$; $-6,000 / -3,000$. X: 19,000; Y: 16,000.
5. The capital was permanent, and shares could be transferred to other investors on the Amsterdam Exchange; investors had limited liability.
6. Dr Cash 240,000; Cr Common Stock 40,000; Cr APIC 200,000.
7. Dr Land 60,000; Cr Common Stock 5,000; Cr APIC 55,000.
8. Annual 42,000; preferred get 84,000; common 16,000.
9. Dr Retained Earnings 90,000, Cr Dividends Payable 90,000; later Dr Dividends Payable 90,000, Cr Cash 90,000.
10. $310,000 + 120,000 - 90,000 = \$340,000$.
11. Total \$940,000; \$15.67 per share.
12. It ordered a special dividend of about \$19 million but allowed Ford's expansion, deferring to the directors' business judgment.
13. Dr Cash 12,000, Cr Contributions-With Donor Restrictions 12,000. Dr Bible Expense 9,000, Cr Cash 9,000. Dr Net Assets Released-With 9,000, Cr Net Assets Released-Without 9,000.
14. Without: $150,000 + 22,000 - 165,000 = +7,000$. With: $30,000 - 22,000 = +8,000$. Total +15,000.
15. A strong answer explains Medici partnership agreements and capital accounts (protecting the family's capital, failing when managers lent to rulers); the VOC's permanent capital and transferable shares (protecting investors' liability, but with little disclosure and grave wrongs in Asia); and Müller's published accounts (honoring donors' intent and building trust, a success); and draws a conclusion about honest reporting.

PORTFOLIO PIECE: FROM PARTNERSHIP TO CORPORATION

Follow a small business through two forms. In year 1 it is a partnership of two or three partners: write a short agreement, record their investments and divide a year's net income. In year 2 the partners incorporate: issue common and preferred stock in exchange for their capital and new investors' cash, record a year's net income, declare a dividend, and prepare a statement of retained earnings and the stockholders' equity section. Add a one-page appendix that applies the same honesty to a nonprofit the business supports, with a simple statement of activities for a restricted gift.

LOOK FOR	WHAT IT MEANS
Partnership	Clear agreement; correct investment entries and income division.
Incorporation	Correct stock issue entries for cash and noncash contributions; proper equity section.
Dividends and retained earnings	Correct declaration and payment entries and statement of retained earnings.
Nonprofit appendix	Restricted gift recorded and released correctly; brief, honest report.

8.1 PARTNERSHIPS: THE MEDICI MODEL

OBJECTIVES

- Describe the features of a partnership and the importance of a written partnership agreement.
- Record partners' investments and divide net income using salary allowances, interest on capital and a profit-sharing ratio.
- Explain how the Medici Bank used partnerships to run its branches.

Warm-up. Two friends start a lawn-care business. One puts in \$600 for a mower; the other does most of the work. If they earn \$3,000 this summer, how should they split it? Write a fair rule and your reasons.

WATCH

Partnerships | Advantages and Disadvantages

Edspira • 6:20

<https://www.youtube.com/watch?v=TMnZGaZoNsl>

WHEN TO WATCH

After the big idea.

KEY TERMS

partnership

An association of two or more persons who carry on a business as co-owners for profit.

unlimited liability

In a general partnership, each partner can be held personally responsible for all the firm's debts.

partnership agreement

The written contract that sets out each partner's capital, duties, share of profits and losses, and what happens if a partner leaves or dies.

mutual agency

Each partner can bind the partnership to contracts within the normal scope of its business.

salary allowance and interest allowance

Amounts used in dividing net income to reward partners for their work and for the capital they have invested; they are not expenses of the firm.

CORE IDEAS

The story. Giovanni di Bicci de' Medici founded the Medici Bank in Florence in 1397. It grew under his son Cosimo into the greatest bank in Europe, with branches in Rome, Venice, Geneva, Bruges, London, Avignon and Milan. Yet it was not one company. Each branch was a separate partnership: the Medici family put up most of the capital, and the branch manager put up a smaller share and became a junior partner, receiving a share of the profits rather than only a salary. A partnership agreement set out each partner's capital, share of profit, duties and the length of the partnership, often five years. The Medici in Florence acted as a holding partnership over the whole network.

How they figured it out. The arrangement solved two problems. A manager who shared in the profits had a reason to work hard and lend carefully. And because each branch was a separate partnership, a disaster in one, such as the London branch's royal loans, did not automatically make the others liable. Partners kept their capital accounts in the branch's books, and at the end of each period the profit was divided according to the agreement. The scheme worked well under Cosimo, who watched his managers closely; under his less attentive successors, managers took risks the agreements were meant to prevent.

The big idea. A partnership keeps a **capital account** and a **drawing account** for each partner. Investments are recorded at their fair value when contributed. Net income is closed to the partners' capital accounts according to the agreement. If the agreement says nothing, income is divided equally. A common formula: first give each partner a **salary allowance** for work, then **interest** on capital, then divide the remainder (positive or negative) in an agreed ratio. These allowances are a way of dividing net income, not expenses of the business.

In business today. Many law firms, medical practices, accounting firms and family businesses are partnerships. Most choose a form with limited liability, such as a limited liability partnership (LLP) or limited liability company (LLC), so that

partners are not personally liable for one another's mistakes. Every partnership needs a clear written agreement; disputes over money break more partnerships than any other cause.

Think it through. “Two are better than one; because they have a good reward for their labour” (Ecclesiastes 4:9). A partnership multiplies strength when both partners deal honestly and the agreement is clear.

PICTURE STUDY



Giovanni di Bicci de' Medici, Agnolo Bronzino (workshop), about 1560 (after earlier likenesses) · Oil on tin or panel · Uffizi Gallery, Florence

Image: [Wikimedia Commons](#), public domain

Giovanni di Bicci (about 1360–1429) founded the Medici Bank in 1397. This portrait belongs to a series of famous Medici painted for the family long after his death.

Look closely

- Read the name painted at the top. Look at his red robe; what might it say about his status in Florence?
- Look at his face. What qualities does the painter suggest?
- Notice the dark background.
- Compare him with Jakob Fugger in Dürer's portrait (Lesson 7.3).

Talk about it

1. Why might a banker organize branches as separate partnerships instead of one company?
2. What would you want in a partnership agreement if you were a branch manager? If you were the Medici?
3. What does Ecclesiastes 4:9 say about why partnerships can succeed?

PROJECT

Write a Partnership Agreement and Divide the Profits

You will write a short partnership agreement for a realistic small business and model how it divides income in good and bad years.

You will need

- Ledger notebook
- Spreadsheet

Steps

1. Choose a two- or three-person business (a landscaping service, a bakery, a tutoring company).
2. Write a one-page agreement: names, business purpose, each partner's capital and duties, salary and interest allowances, the profit-and-loss ratio, drawing limits, and what happens if a partner leaves.
3. Journalize each partner's initial investment.
4. Build a spreadsheet that divides net income under your agreement for any net income entered.
5. Show the division for a good year, an average year and a loss year.
6. Journalize the closing entry for the average year.
7. Write a paragraph: is your agreement fair to each partner in all three years? What would you change?

Tips

- Fair does not always mean equal; think about who brings capital, who brings work, and who takes risk.
- Include a dispute clause: how will partners settle disagreements?

Check your work

- ☐ My agreement covers capital, duties, allowances, ratio, drawings and withdrawal of a partner.
- ☐ My spreadsheet divides any net income so the shares total net income.
- ☐ My closing entry balances.

LEDGER NOTEBOOK

1. Draw the Medici network as a central partnership in Florence with branch partnerships around it.
2. Copy the income division from Worked Example 2 as a table.
3. Write Ecclesiastes 4:9.

KEY FORMULAS

$\text{Remainder} = \text{Net income} - \text{Salary allowances} - \text{Interest allowances}$

From history. Many Medici partnership agreements survive in Florentine archives. They name the partners, their capital, their shares of profit and the length of the partnership, and they forbid branch managers to lend to princes or nobles beyond set limits, rules that were not always obeyed.

WORKED EXAMPLES

Example 1. Ana Ruiz and Ben Cole form a partnership. Ana invests \$40,000 cash and equipment with a fair value of \$20,000; Ben invests \$40,000 cash. Journalize.

Show solution

1. Ana: Debit Cash \$40,000; Debit Equipment \$20,000; credit Ana Ruiz, Capital \$60,000.
2. Ben: Debit Cash \$40,000; credit Ben Cole, Capital \$40,000.

Answer: Capital: Ana \$60,000; Ben \$40,000.

Example 2. Their agreement gives salary allowances of \$30,000 to Ana and \$20,000 to Ben, 10% interest on beginning capital, and divides the remainder equally. Net income is \$90,000. Divide it and journalize the closing of Income Summary.

Show solution

1. Salaries: Ana 30,000; Ben 20,000; total 50,000.
 2. Interest: Ana $10\% \times 60,000 = 6,000$; Ben $10\% \times 40,000 = 4,000$; total 10,000.
 3. Remainder: $90,000 - 50,000 - 10,000 = 30,000$; equally, 15,000 each.
 4. Ana: $30,000 + 6,000 + 15,000 = \$51,000$. Ben: $20,000 + 4,000 + 15,000 = \$39,000$.
Total 90,000.
 5. Debit Income Summary \$90,000; credit Ana Ruiz, Capital \$51,000; credit Ben Cole, Capital \$39,000.
-

Answer: Ana \$51,000; Ben \$39,000.

Example 3. Suppose net income is only \$50,000. Divide it under the same agreement.

Show solution

1. Salaries and interest still total 60,000.
 2. Remainder: $50,000 - 60,000 = -10,000$; equally, -5,000 each.
 3. Ana: $30,000 + 6,000 - 5,000 = \$31,000$. Ben: $20,000 + 4,000 - 5,000 = \$19,000$.
Total 50,000.
-

Answer: Ana \$31,000; Ben \$19,000. Allowances are applied in full and the shortfall is shared.

PRACTICE

1. Easy Name three features of a general partnership.

Show answer

Unlimited liability, mutual agency, limited life (it ends when a partner leaves), co-ownership of property, no separate income tax.

2. **Easy** If the agreement does not say how to divide income, how is it divided?

Show answer

Equally.

3. **Easy** How was each Medici branch organized?

Show answer

As a separate partnership, with the Medici holding most of the capital and the branch manager as a junior partner sharing in profits.

4. **Medium** Journalize a partner investing land worth \$75,000 (it cost him \$50,000 years ago).

Show answer

Debit Land \$75,000; credit Partner, Capital \$75,000 (fair value).

5. **Medium** Net income \$60,000 divided in a 3:2 ratio. Each share?

Show answer

\$36,000 and \$24,000.

6. **Medium** Capital: Kim \$50,000, Lee \$30,000. Income \$48,000 divided in the ratio of capital. Each share?

Show answer

Kim \$30,000; Lee \$18,000.

7. **Medium** Why are salary allowances not expenses of the partnership?

Show answer

They are a method of dividing the owners' net income among themselves, not payments to outside employees.

8. **Hard** Salary allowances \$25,000 and \$15,000; interest 8% on capitals of \$40,000 and \$60,000; remainder 1:1. Net income \$64,000. Divide it.

Show answer

Interest 3,200 and 4,800; remainder $64,000 - 40,000 - 8,000 = 16,000$; 8,000 each.
Partner 1: 36,200; Partner 2: 27,800.

9. **Hard** Same agreement, net income \$40,000. Divide it.

Show answer

Remainder $40,000 - 48,000 = -8,000$; $-4,000$ each. Partner 1: 24,200; Partner 2: 15,800.

10. **Hard** A partnership has capital of \$100,000 (two equal partners). Carla invests \$50,000 for a one-third interest. Is there a bonus? Journalize.

Show answer

Total capital 150,000; one-third = 50,000 = her investment, so no bonus. Debit Cash \$50,000; credit Carla, Capital \$50,000.

11. **Challenge** Why did the Medici give branch managers a share of profits rather than only a salary, and what went wrong under later Medici?

Show answer

Profit-sharing gave managers a reason to work hard and lend prudently; under less watchful later Medici, managers made risky loans (to rulers) that the agreements and oversight failed to prevent.

COMMON MISTAKES

- Treating partners' salary allowances as expenses on the income statement.
- Recording noncash investments at the partner's original cost instead of fair value.
- Forgetting to apply allowances in full when net income is less than the allowances.

Make it a game • Divide the Profit Negotiation. You and your parent are Medici-style partners. Net income is 60,000. Write a short agreement: salary allowances, interest on capital and a profit ratio. Calculate each partner's share. Then your parent plays a partner who claims there was no written agreement. Explain what the law presumes, and why unlimited liability and mutual agency matter.

Scripture. "Two are better than one; because they have a good reward for their labour." (Ecclesiastes 4:9, KJV)

Partners can accomplish together what neither could alone, when their agreement is clear and their dealing honest.

8.2 THE CORPORATION: FROM THE DUTCH EAST INDIA COMPANY TO TODAY

OBJECTIVES

- Describe the features of a corporation: separate legal entity, limited liability, transferable shares, continuous life, and separate taxation and regulation.
- Explain how the Dutch East India Company (VOC, 1602) pioneered permanent capital and publicly traded shares.
- Compare the equity sections of a proprietorship, a partnership and a corporation.

Warm-up. If you bought a share of a company and the company went bankrupt owing \$1 million more than it owned, how much could you lose? Write your guess, then check it in the big idea.

WATCH

Corporations and limited liability | Taxes | Finance & Capital Markets | Khan Academy

Khan Academy • 9:57

<https://www.youtube.com/watch?v=VnTIKcligyY>

WHEN TO WATCH

After the story, before the big idea: why people form corporations and what limited liability means.

Note: Sal Khan mentions the tax treatment of corporations briefly; the lesson covers it in Worked Example 3.

KEY TERMS

corporation

A legal entity separate from its owners, created under state law, that can own property, make contracts, sue and be sued in its own name.

limited liability

Stockholders can lose only what they invested; they are not personally liable for the corporation's debts.

stockholders' (shareholders') equity

The owners' claim in a corporation: paid-in capital (what stockholders invested) plus retained earnings (profits kept in the business).

board of directors

The group elected by stockholders to oversee management and declare dividends.

double taxation

A corporation pays income tax on its profits, and stockholders pay tax again on dividends they receive.

CORE IDEAS

The story. In 1602 the States General of the Netherlands chartered the United East India Company (Vereenigde Oostindische Compagnie, VOC), merging the competing Dutch companies that had been sending fleets to Asia. Unlike the old voyage partnerships, the VOC raised capital from anyone who wished to invest, about 6.4 million guilders in all, with more than 1,100 investors in the Amsterdam chamber alone, including merchants, craftsmen and servants. Shares could not be cashed in, but they could be sold to someone else, and a market for them soon grew up at the Amsterdam Exchange, the first regular stock market. Investors' risk was limited to what they had paid in. The VOC became the largest trading company of its age.

How they figured it out. Long voyages and permanent trading posts needed permanent capital that could not be pulled out after every voyage. The solution was to make the capital permanent and the shares transferable: an investor who wanted money back sold his share to another investor instead of taking cash out of the company. Limited liability made it safe for people of modest means to invest. These features, together with a board of directors and paid managers, are still the core of the modern corporation. The VOC also showed the corporation's dangers. Its directors gave shareholders little information, its trading monopolies were enforced by force, and in Asia and at the Cape it bought and used enslaved people, a grave evil, since people made in God's image are never property.

The big idea. A corporation is a separate legal entity. Its owners (stockholders) have **limited liability**, can **transfer** shares without the company's consent, and the corporation has **continuous life** regardless of who owns its shares. Management is separate from ownership: stockholders elect a **board of directors**, which appoints

officers. Corporations pay their own income tax, and dividends are taxed again to stockholders. In accounting, the owners' equity section is called **stockholders' equity** and is divided into **paid-in capital** (what stockholders invested) and **retained earnings** (profits kept in the business). There are no drawing accounts; owners receive dividends declared by the board.

In business today. Most large businesses are corporations, from family-held companies to giants owned by millions of stockholders. Public corporations must publish audited statements (Unit 4). Many small businesses choose an LLC, which combines limited liability with simpler taxation. The question the VOC first raised remains: how can owners who are many and far away be sure that managers run the company honestly in their interest? Accounting, audits and boards of directors are a large part of the answer.

Who gained? VOC scorecard. Financiers: 4, investors earned large dividends for many decades. Risk-takers: 4, merchants who founded it prospered. Builders: 4, shipwrights and navigators advanced their crafts. Workers: 2, sailors faced deadly voyages and harsh discipline. Customers: 3, Europeans got spices, though at monopoly prices. Community: 1 in Asia, where the company used force and slavery; higher in Amsterdam, which grew rich. The company was dissolved in 1799, deep in debt.

PICTURE STUDY



The Courtyard of the Old Exchange in Amsterdam, Emanuel de Witte, 1653 · Oil on canvas · Museum Boijmans Van Beuningen, Rotterdam
Image: [Wikimedia Commons](#), public domain

The Amsterdam Exchange (Beurs) opened in 1611. Merchants met here daily at set hours, and shares of the VOC changed hands among them, the beginning of the stock market.

Look closely

- Find the clock tower. Why would merchants care about the time?
- Look at the groups of merchants. What are they doing?
- Find the arches and the open sky.
- Look for any children, dogs or beggars among the merchants.

Talk about it

1. How could a VOC shareholder who needed cash get his money back without the company paying it out?
2. Why did a permanent, open marketplace matter for transferable shares?
3. Who in this scene might be a financier, a risk-taker or a customer?

PROJECT

Choose a Business Form

You will compare the business forms for a realistic small business and recommend one, with the accounting each would require.

You will need

- Ledger notebook
- Spreadsheet

Steps

1. Choose a business that two or three people might start (a bakery, an engine-repair shop, a farm stand).
2. Make a table comparing a sole proprietorship, a general partnership, an LLC and a corporation on: liability, ease of raising money, taxation, paperwork, continuity and control.
3. Prepare the equity section of the balance sheet as it would look under a partnership and under a corporation, for the same \$120,000 of equity.
4. Using assumed tax rates (state them), compare what the owners would keep from \$80,000 of profit as a partnership and as a corporation paying out all profits.
5. Write a stakeholder note: how would your choice affect lenders, customers and any employees?
6. Write a one-page recommendation to the founders, noting that they should consult a lawyer and accountant before choosing.

Tips

- Tax rates change over time and differ by state; say clearly that yours are assumptions.
- Liability protection is only as good as the owners' honesty and separation of personal and business affairs.

Check your work

- ☐ My comparison table covers all four forms and six features.
- ☐ My two equity sections both total \$120,000.

- My recommendation gives reasons and admits the limits of a student's analysis.

LEDGER NOTEBOOK

1. Draw a timeline: 1397 Medici partnerships; 1600 English East India Company; 1602 VOC; 1611 Amsterdam Exchange opens; 1792 Buttonwood Agreement; today's corporations.
2. Copy the three equity sections from Worked Example 1.
3. Write the VOC stakeholder scorecard.

KEY FORMULAS

Stockholders' equity = Paid-in capital + Retained earnings

From history. The English East India Company was chartered two years earlier, in 1600, but at first raised money voyage by voyage. The VOC's permanent, tradable capital was the more important model for later corporations.

WORKED EXAMPLES

Example 1. Compare the equity sections of three businesses, each with assets of \$500,000 and liabilities of \$200,000: a proprietorship owned by Lee; a partnership of Lee and Park (capital \$180,000 and \$120,000); a corporation whose stockholders invested \$220,000 and which has kept \$80,000 of profits.

Show solution

1. Equity in each = $500,000 - 200,000 = \$300,000$.
2. Proprietorship: Lee, Capital \$300,000.
3. Partnership: Lee, Capital \$180,000; Park, Capital \$120,000; total \$300,000.
4. Corporation: Paid-in capital \$220,000; Retained earnings \$80,000; total stockholders' equity \$300,000.

Answer: Same total equity, \$300,000, presented three ways.

Example 2. A corporation owes \$1,800,000 and its assets can be sold for only \$1,200,000 when it fails. Mrs. Hale owns 1% of its shares, for which she paid \$15,000. What can she lose? Compare with a general partner owning 1% of a partnership in the same situation.

Show solution

1. Stockholder: limited liability; her loss is at most her \$15,000 investment. Creditors bear the \$600,000 shortfall.
2. General partner: unlimited liability; if the other partners cannot pay, creditors can pursue her personal assets for the whole \$600,000 shortfall.

Answer: Stockholder loses at most \$15,000; a general partner could lose much more.

Example 3. A corporation earns \$100,000 before income tax. Assume a corporate tax rate of 21% and that all after-tax profit is paid out as dividends, taxed to stockholders at 15%. How much reaches the stockholders after both taxes? Compare with a partnership whose partners pay 24% on the same \$100,000.

Show solution

1. Corporate tax: $100,000 \times 0.21 = 21,000$; after-tax profit 79,000.
2. Dividend tax: $79,000 \times 0.15 = 11,850$; stockholders keep 67,150.
3. Partnership (no entity tax): partners pay $100,000 \times 0.24 = 24,000$ and keep 76,000.
4. The difference illustrates double taxation; rates are assumed for illustration.

Answer: Stockholders keep \$67,150; partners keep \$76,000 under these assumed rates.

PRACTICE

1. Easy When was the VOC chartered, and what was new about its shares?

Show answer

1602; its capital was permanent and its shares could be transferred (sold) to others, creating the first regular stock market.

2. Easy Name five features of a corporation.

Show answer

Separate legal entity, limited liability, transferable shares, continuous life, separation of ownership and management (plus separate taxation and regulation).

3. Easy What two main parts make up stockholders' equity?

Show answer

Paid-in capital and retained earnings.

4. Medium Why can a corporation not have a drawing account?

Show answer

Owners do not take assets out at will; distributions to stockholders are dividends declared by the board.

5. Medium Assets \$750,000; liabilities \$310,000; paid-in capital \$300,000. Retained earnings?

Show answer

\$140,000.

6. Medium Give one advantage and one disadvantage of the corporate form for a small family business.

Show answer

Advantage: limited liability or easier to raise capital. Disadvantage: double taxation, more regulation and paperwork.

7. Medium Why was transferability of shares so important to the VOC?

Show answer

It let the company keep permanent capital for long voyages while investors could still get their money back by selling to others.

8. **Hard** Using assumed rates (corporate 21%, dividends 15%), what does \$250,000 of pre-tax corporate income yield to stockholders if all is paid as dividends?

Show answer

After corporate tax 197,500; after dividend tax 167,875.

9. **Hard** What governance problem did the VOC's shareholders face, and how do modern corporations address it?

Show answer

Managers controlled the company with little reporting to owners; today audited statements, independent directors and securities laws require disclosure and oversight.

10. **Hard** Explain in two or three sentences why the VOC's scorecard is mixed.

Show answer

It created enormous wealth for investors and Amsterdam and advanced shipping, but it used monopoly and force in Asia and bought and used enslaved people, harming communities and workers; great size is not the same as greatness.

11. **Challenge** A corporation with 1,000,000 shares has stockholders' equity of \$24 million. What is book value per share? Why might the shares trade at \$40?

Show answer

\$24 per share; the market values expected future earnings and assets at more than their recorded cost.

COMMON MISTAKES

- Thinking limited liability means a corporation's creditors are never paid; it means stockholders are not personally liable beyond their investment.
- Using a drawing account for a corporation.
- Confusing book value per share with market price.

Make it a game • Which Form Am I. Your parent describes a business with clues: owners are personally liable, shares can be sold freely, there is double taxation, or the founders must agree on every decision. Name the form (sole proprietorship, partnership or corporation) and the clue that gave it away. Then explain what the VOC of 1602 pioneered. Swap roles and write your own clues.

8.3 STOCK: ISSUING SHARES FROM BUTTONWOOD TO TODAY

OBJECTIVES

- Distinguish common and preferred stock, and authorized, issued and outstanding shares.
- Journalize the issue of par-value and no-par stock for cash and for noncash assets.
- Compute dividends for cumulative preferred stock.

Warm-up. If a company sells new shares to investors, does the company receive money? If you sell your shares to a friend, does the company receive anything? Write your answers.

WATCH

Common Stock (what it is and how to record it)

Edspira • 6:39

<https://www.youtube.com/watch?v=HaIJWGhjgnc>

WHEN TO WATCH

After the big idea and before the worked examples.

BACKUP VIDEO

FA 43 - Shareholders' Equity

Tony Bell • 7:58

<https://www.youtube.com/watch?v=HKB7kX09hKg>

Before the practice set.

KEY TERMS

common stock

The basic ownership shares of a corporation, usually with the right to choose the directors and to share in dividends and residual assets.

preferred stock

Shares with priority over common stock for dividends (usually a fixed rate) and in liquidation, usually without a say in choosing the directors.

par value

An arbitrary amount per share set in the corporate charter, often very small; it has nothing to do with market value.

additional paid-in capital

The amount received for stock above its par (or stated) value.

authorized, issued and outstanding

The number of shares the charter allows; the number sold so far; and the number issued still held by stockholders (issued minus any bought back).

cumulative preferred

Preferred stock whose missed dividends (dividends in arrears) must be paid before any common dividend.

CORE IDEAS

The story. On May 17, 1792, twenty-four stockbrokers and merchants met, by tradition under a buttonwood (sycamore) tree on Wall Street in New York, and signed a short agreement to trade securities only among themselves and at a fixed commission. The Buttonwood Agreement is counted as the founding of the New York Stock Exchange. The securities they traded were mostly government bonds and the shares of a few banks and insurance companies, such as the Bank of New York. Over the next century the exchange grew to trade the stocks of railroads, steel companies and every kind of industry.

How they figured it out. Investors need confidence that a share is what it claims to be: that the company really received the money, that its shares are not secretly multiplied, and that dividends are paid fairly. Corporate charters therefore state how many shares may be issued (authorized), and the corporation's books record every share issued and the money received. Stock certificates once carried printed numbers and were recorded in a stock ledger; today shares are recorded electronically, but the accounting is the same.

The big idea. When a corporation issues stock for cash, debit Cash for the amount received; credit Common Stock for $\text{par value} \times \text{shares}$; credit Additional Paid-in Capital for the excess. No-par stock with no stated value is credited entirely to Common Stock. Stock issued for land or equipment is recorded at the fair value of what is received (or of the stock, if clearer). **Preferred** stock gets its dividend first; if it is **cumulative**, any missed dividends must be paid before common stockholders

receive anything. Trading among investors on an exchange does not change the corporation's books at all; only issuing shares (or buying them back) does.

In business today. Companies raise money by an initial public offering (IPO) and later offerings; afterward, almost all trading is between investors. A company's market value (share price $\times$ shares outstanding) can be far above or below its book value. A student should never confuse a stock's price today with the money the company received when it issued the shares, or with what it is worth on its books.

Think it through. Owning a share means owning a small part of a real business, with its risks. This course studies stock to understand accounting, not to recommend any investment; any real investing is for adults, with care and a parent's or professional's counsel.

PICTURE STUDY



Automatic Ticker Apparatus, New York Stock Exchange, Unknown photographer, about 1900–1910 · Photograph · Library of Congress, Prints and Photographs Division
Image: [Wikimedia Commons](#), public domain

The stock ticker, improved by Thomas Edison and others after 1867, sent each trade's price over telegraph wires to brokers' offices. The stations on the exchange floor recorded and transmitted the trades.

Look closely

- Find the stations and their equipment.
- Imagine the floor full of brokers. Where would they stand?
- Look at the building's windows and ceiling.
- Look for any boards or posted prices.

Talk about it

1. When a share traded on this floor, did the company that issued it receive any money? Why or why not?
2. Why did investors need fast, accurate price information?
3. What records would a corporation keep to know who its stockholders were?

PROJECT

Form a Corporation on Paper

You will form a small, imaginary corporation, issue its stock and prepare its stockholders' equity section.

You will need

- Ledger notebook
- Spreadsheet

Steps

1. Invent a corporation: its business, name and charter. Authorize 1,000,000 shares of \$1 par common stock and 20,000 shares of 5%, \$50 par cumulative preferred.
2. Journalize the issue of 200,000 common shares at \$8 to the founders and investors.
3. Journalize the issue of 10,000 common shares to a founder in exchange for equipment with a fair value of \$85,000.
4. Journalize the issue of 4,000 preferred shares at \$52.
5. Prepare the paid-in capital section of the balance sheet.
6. Assume no dividends are paid in year 1 and \$25,000 is declared in year 2. Divide it between preferred and common.
7. Write a one-paragraph explanation for a new investor of the difference between the shares' par value, issue price, book value and market price.

Tips

- Keep each class of stock and its APIC separate.
- Book value per common share uses common equity only.

Check your work

- ☐ My entries balance and record noncash assets at fair value.
- ☐ Paid-in capital totals $\$1,600,000 + \$85,000 + \$208,000 = \$1,893,000$.
- ☐ Year-2 dividends: preferred \$20,000 (two years at \$10,000), common \$5,000.

LEDGER NOTEBOOK

1. Draw the paid-in capital section with each line labeled.
2. Copy the cumulative preferred example from Worked Example 3.
3. Write one sentence on the Buttonwood Agreement.

KEY FORMULAS

$$\text{APIC} = (\text{Issue price} - \text{Par}) \times \text{Shares}$$

$$\text{Preferred dividend per year} = \text{Par} \times \text{Dividend rate} \times \text{Shares}$$

From history. The New York Stock Exchange met in the Tontine Coffee House and other rented rooms for decades before moving into its own building. Its present building on Broad Street, with its columned front, opened in 1903.

WORKED EXAMPLES

Example 1. A corporation issues 10,000 shares of \$1 par common stock at \$15 a share. Journalize.

Show solution

1. Cash = $10,000 \times 15 = \$150,000$. Common Stock = $10,000 \times 1 = \$10,000$. APIC = \$140,000.
2. Debit Cash \$150,000; credit Common Stock \$10,000; credit Additional Paid-in Capital–Common \$140,000.

Answer: Cash \$150,000; Common Stock \$10,000; APIC \$140,000.

Example 2. The corporation issues 2,000 shares of \$1 par common stock to the owner of a building lot appraised at \$34,000 (the stock is not yet traded). Journalize.

Show solution

1. Record at the fair value of the land, \$34,000.
2. Debit Land \$34,000; credit Common Stock \$2,000; credit Additional Paid-in Capital–Common \$32,000.

Answer: Land \$34,000; Common Stock \$2,000; APIC \$32,000.

Example 3. A corporation has 5,000 shares of 6%, \$100 par cumulative preferred stock and 50,000 common shares. No dividends were paid last year. This year the board declares \$70,000 of dividends. How much goes to each class?

Show solution

1. Annual preferred dividend = $5,000 \times 100 \times 0.06 = \$30,000$.
2. Arrears from last year: \$30,000. This year's: \$30,000. Preferred receive \$60,000.
3. Common receive $70,000 - 60,000 = \$10,000$, or \$0.20 a share.

Answer: Preferred \$60,000; common \$10,000.

PRACTICE

1. Easy What was signed on May 17, 1792, and why does it matter?

Show answer

The Buttonwood Agreement among 24 brokers, counted as the founding of the New York Stock Exchange.

2. Easy Does the corporation's cash change when one investor sells shares to another on an exchange?

Show answer

No; only issuing or repurchasing shares changes the corporation's books.

3. Easy What is par value?

Show answer

An arbitrary legal amount per share in the charter, unrelated to market value.

4. Medium Issue 4,000 shares of \$5 par common at \$22. Journalize.

Show answer

Dr Cash 88,000; Cr Common Stock 20,000; Cr APIC 68,000.

5. Medium Issue 3,000 shares of no-par common (no stated value) at \$18. Journalize.

Show answer

Dr Cash 54,000; Cr Common Stock 54,000.

6. **Medium** Authorized 500,000; issued 120,000; bought back 5,000. How many outstanding?

Show answer

115,000.

7. **Medium** Issue 1,000 shares of 5%, \$100 par preferred at \$104. Journalize.

Show answer

Dr Cash 104,000; Cr Preferred Stock 100,000; Cr APIC–Preferred 4,000.

8. **Hard** 8,000 shares of 5%, \$50 par cumulative preferred; no dividends for two years; this year \$55,000 is declared. Preferred and common shares?

Show answer

Annual 20,000; arrears 40,000 + current 20,000 = 60,000 > 55,000, so preferred get all \$55,000 (and \$5,000 remains in arrears); common get nothing.

9. **Hard** Same as Problem 8 but noncumulative. Division?

Show answer

Preferred get only this year's 20,000; common get 35,000.

10. **Hard** Prepare the paid-in capital section: Preferred stock \$100,000; APIC–Preferred \$4,000; Common stock \$30,000; APIC–Common \$202,000.

Show answer

Total paid-in capital \$336,000, with each item listed under its class.

11. **Challenge** A company has 2 million shares outstanding at a market price of \$35 and stockholders' equity of \$28 million. Compare market value and book value and explain the difference.

Show answer

Market value \$70 million; book value \$28 million (\$14 a share). Investors value expected future earnings, brand and other unrecorded strengths above recorded cost.

COMMON MISTAKES

- Crediting the whole issue price to Common Stock when the stock has a par value.
- Recording trades between investors in the corporation's books.
- Forgetting dividends in arrears on cumulative preferred stock.

Make it a game • Shares on Paper. Form a paper corporation with 1,000 authorized shares at 5 dollars par. Your parent buys 400 shares at 12 dollars each. Journalize the issue, separating common stock from additional paid-in capital. Then state authorized, issued and outstanding shares. Add a no-par example and a preferred share with a cumulative dividend, and have your parent check each entry.

8.4 DIVIDENDS AND RETAINED EARNINGS: FORD VERSUS THE DODGE BROTHERS

OBJECTIVES

- Journalize the declaration and payment of cash dividends and explain the key dates.
- Prepare a statement of retained earnings.
- Explain the board's choice between paying dividends and retaining earnings, using Dodge v. Ford Motor Co. (1919).

Warm-up. If a business you owned with a partner earned \$100,000, would you rather take the money home or use it to build a bigger shop? Write what you would want to know before deciding.

WATCH

Journal Entry for Dividends

Edspira · 4:45

<https://www.youtube.com/watch?v=zGJC-lDE5sk>

WHEN TO WATCH

After the big idea.

BACKUP VIDEO

FA 44 - Shareholders' Equity Example Problem

Tony Bell · 14:21

<https://www.youtube.com/watch?v=0RknX2fPF-U>

Before the practice set, for a full stockholders' equity example.

KEY TERMS

retained earnings

The total of a corporation's net income since it began, minus net losses and dividends: profits kept in the business.

dividend

A distribution of a corporation's earnings to its stockholders, declared by the board of directors.

declaration, record and payment dates

The date the board declares the dividend (a liability is created), the date that determines who receives it, and the date it is paid.

statement of retained earnings

Beginning retained earnings + net income – dividends = ending retained earnings.

stock dividend

A distribution of additional shares instead of cash; it moves an amount from retained earnings to paid-in capital without changing total equity.

CORE IDEAS

The story. By 1916 the Ford Motor Company was enormously profitable and had a huge cash surplus. Henry Ford, who controlled the company, announced that he would stop paying special dividends and instead use the profits to build the giant River Rouge plant, hire more workers and keep cutting the Model T's price. John and Horace Dodge, who owned about a tenth of Ford's stock and were starting their own car company, sued. In 1919 the Michigan Supreme Court ruled in *Dodge v. Ford Motor Co.* that a business corporation exists chiefly for the profit of its stockholders, and ordered Ford to pay a special dividend of about \$19 million. But the court also let Ford go ahead with the River Rouge expansion, saying judges should not second-guess the directors' business judgment.

How they figured it out. The case put a question every corporation faces into sharp focus: should profits be paid out to stockholders or kept to grow the business? Ford argued that low prices, high wages and expansion served everyone, including stockholders in the long run. The Dodges argued that the stockholders' money was being used for other purposes without their consent. Accounting keeps the record of that choice in **retained earnings**: every dollar of profit is either paid out as dividends or retained.

The big idea. Net income is closed to Retained Earnings (not to a capital account). Dividends have three dates. On the **declaration date**, the board creates a liability: debit Retained Earnings (or a Dividends account closed to it), credit Dividends Payable. The **record date** determines who receives it (no entry). On the **payment date**, debit Dividends Payable, credit Cash. The **statement of retained earnings**

shows beginning retained earnings + net income – dividends = ending retained earnings. A corporation needs both retained earnings and cash to pay a cash dividend; retained earnings are not a pile of cash.

In business today. Mature companies often pay steady dividends; young, growing companies often pay none and reinvest everything. Boards weigh stockholders' desire for income, the company's need for cash, lenders' restrictions, and opportunities to invest. Today many companies also return cash by buying back their own shares. Courts still generally defer to directors' business judgment, as the Michigan court did on the River Rouge plant.

Who gained? Ford's plan scored well for customers (lower prices), workers (more jobs at high wages) and the community (Detroit's growth), while the Dodges, as minority financiers, wanted their share. The court tried to protect both: it ordered a dividend and let the expansion proceed. A well-run company serves its owners by serving its customers and workers well over the long run.

PICTURE STUDY



A Family Drive in a Model T, Unknown photographer, about 1910 · Photograph · University of Washington Libraries, Special Collections

Image: [Wikimedia Commons](#), public domain

Ford sold more than fifteen million Model Ts between 1908 and 1927. Henry Ford's plan to retain profits and keep cutting the price was meant to put a car within reach of families like this one.

Look closely

- Count the passengers. Who is driving?
- Look at the car: the top, the wheels, the lamps.
- Look at the road and the countryside.
- Look at the clothes. What season might it be?

Talk about it

1. Ford wanted to use profits to lower the Model T's price. Which stakeholders would gain from that, and which would gain from a larger dividend?
2. Why did the court order a dividend but still allow the expansion?
3. Where in the accounts does the choice between dividends and reinvestment appear?

PROJECT

A Board Meeting on Dividends

You will play the board of a small corporation deciding whether to pay a dividend, using its statements.

You will need

- Spreadsheet
- Ledger notebook

Steps

1. Use this corporation: 100,000 common shares outstanding; retained earnings \$420,000; cash \$180,000; net income this year \$150,000; a planned equipment purchase next year of \$200,000; a bank loan agreement that requires cash of at least \$50,000.
2. List the options: no dividend; \$0.50 a share; \$1.00 a share; a 5% stock dividend.
3. For each option, show the effect on cash, retained earnings and total equity.
4. Check each option against the loan requirement and the equipment plan.
5. Prepare the statement of retained earnings for the option you choose.
6. Journalize the declaration and payment of your chosen dividend.
7. Write the board's resolution and a short letter to stockholders explaining the decision and how it serves the company's stakeholders.

Tips

- A cash dividend reduces cash; a stock dividend does not.
- Remember Dodge v. Ford: the board must have a sound business reason.

Check your work

- ☐ My comparison shows cash, retained earnings and equity for all four options.
- ☐ My chosen option keeps cash at or above the loan requirement.
- ☐ My letter explains the decision honestly and clearly.

LEDGER NOTEBOOK

1. Draw a timeline of the three dividend dates with the entry (or no entry) for each.
2. Copy the statement of retained earnings.
3. Write the Ford stakeholder scorecard.

KEY FORMULAS

Ending RE = Beginning RE + Net income – Dividends

From history. The Dodge brothers had supplied engines and chassis for Ford's earliest cars and were paid partly in Ford stock. After the lawsuit, Henry Ford bought out all the minority stockholders in 1919, and the company was owned by the Ford family until it sold shares to the public in 1956.

WORKED EXAMPLES

Example 1. On March 1 a board declares a \$0.40 per share cash dividend on 250,000 shares outstanding, to stockholders of record on March 15, payable April 1. Journalize.

Show solution

1. Dividend = $250,000 \times 0.40 = \$100,000$.
2. Mar 1: Debit Retained Earnings \$100,000; credit Dividends Payable \$100,000.
3. Mar 15: no entry (record date).
4. Apr 1: Debit Dividends Payable \$100,000; credit Cash \$100,000.

Answer: A \$100,000 liability on March 1, paid April 1.

Example 2. Prepare a statement of retained earnings: beginning retained earnings \$240,000; net income \$85,000; preferred dividends \$10,000; common dividends \$20,000.

Show solution

1. Heading: Company / Statement of Retained Earnings / For the Year Ended December 31, 20—.
 2. Beginning \$240,000 + net income \$85,000 = \$325,000.
 3. Less dividends: 10,000 + 20,000 = \$30,000.
 4. Ending retained earnings: \$295,000.
-

Answer: Ending retained earnings \$295,000.

Example 3. Prepare the stockholders' equity section: preferred stock \$100,000; APIC–preferred \$4,000; common stock \$50,000; APIC–common \$350,000; retained earnings \$295,000. Then compute book value per common share if 50,000 common shares are outstanding and preferred has no arrears.

Show solution

1. Paid-in capital: $100,000 + 4,000 + 50,000 + 350,000 = \$504,000$.
 2. Total stockholders' equity: $504,000 + 295,000 = \$799,000$.
 3. Common equity = total equity – preferred claim (par \$100,000) = $799,000 - 100,000 = \$699,000$.
 4. Book value per common share = $699,000 \div 50,000 = \$13.98$.
-

Answer: Total equity \$799,000; book value per common share \$13.98.

PRACTICE

1. Easy What did the court decide in Dodge v. Ford Motor Co. (1919)?

Show answer

That a corporation exists chiefly for stockholders' profit; it ordered a special dividend of about \$19 million but let Ford proceed with expansion under the business judgment rule.

2. Easy Which date creates the dividend liability?

Show answer

The declaration date.

3. Easy Beginning RE \$80,000; net income \$30,000; dividends \$12,000. Ending RE?

Show answer

\$98,000.

4. Medium Journalize declaring a \$0.25 dividend on 400,000 shares.

Show answer

Dr Retained Earnings 100,000; Cr Dividends Payable 100,000.

5. Medium Journalize closing net income of \$150,000 for a corporation.

Show answer

Dr Income Summary 150,000; Cr Retained Earnings 150,000.

6. Medium Ending RE \$410,000; net income \$95,000; dividends \$40,000. Beginning RE?

Show answer

\$355,000.

7. Medium A company has \$2 million of retained earnings but only \$50,000 of cash. Can it pay a \$500,000 cash dividend? Explain.

Show answer

Not without raising cash; retained earnings are not cash, they are mostly invested in other assets.

8. Hard Net loss of \$60,000; dividends \$25,000; beginning RE \$70,000. Ending RE?

Show answer

$70,000 - 60,000 - 25,000 = -15,000$ (a deficit).

9. **Hard** A 10% stock dividend on 100,000 shares of \$1 par stock when the market price is \$20. How many shares are issued, and what happens to total equity? (Record at market value.)

Show answer

10,000 shares; Dr Retained Earnings 200,000; Cr Common Stock 10,000, APIC 190,000; total equity unchanged.

10. **Hard** Give two reasons a board might retain earnings instead of paying dividends, and one reason stockholders might object.

Show answer

To fund growth or repay debt, or to keep a cash cushion; stockholders may object if they need income or doubt the reinvestment will earn a good return.

11. **Challenge** Write a stakeholder scorecard for Ford's decision to retain profits for River Rouge and lower prices.

Show answer

Sample: customers 5 (lower prices); workers 5 (jobs at high wages); community 4 (growth); builders 5; risk-taker Ford 5; minority financiers (the Dodges) 2, who wanted dividends, which the court partly restored.

COMMON MISTAKES

- Thinking retained earnings are cash.
- Making an entry on the record date.
- Treating dividends as an expense on the income statement.

Make it a game • Board Meeting on Dividends. Chair a board meeting. Your parent plays a Dodge brother demanding a dividend, and you plan to reinvest. Settle on an amount per share. Then journalize the declaration date, state the record date, and journalize the payment date, saying what changes on each. Compute retained earnings after the dividend. Beat the clock with all three entries.

8.5 NONPROFIT AND CHURCH ACCOUNTING: GEORGE MÜLLER'S REPORTS

OBJECTIVES

- Explain how nonprofit accounting differs from business accounting: net assets with and without donor restrictions, and the statement of activities.
- Record contributions, restricted gifts and the release of restrictions.
- Describe how George Müller's published reports built trust in a ministry that never asked anyone for money.

Warm-up. If you gave \$50 to your church specifically for missions, how would you want to know it was used for missions? Write what a church would need to record and report.

WATCH

The ABC's of Nonprofit Financial Statements - Ten Minute Talks

DeKalb County Nonprofit Partnership · 6:28

<https://www.youtube.com/watch?v=KKMLk69s03Q>

WHEN TO WATCH

After the big idea.

BACKUP VIDEO

Greatest Heroes of Church History: George Müller (1805-1898)

John Barnett Online Teaching · 5:55

<https://www.youtube.com/watch?v=4Yw2g0xwt84>

With the story: a visit to Müller's grave and the museum in Bristol, including his handwritten record books.

KEY TERMS

nonprofit organization

An organization that exists for a charitable, religious, educational or other public purpose; it has no owners, and any surplus is used for its mission.

donor restriction

A limit set by a donor on how or when a gift may be used (for example, “for missions” or “for the building fund”).

statement of activities

A nonprofit’s version of the income statement, showing revenues, expenses and the change in net assets by class.

net assets

A nonprofit’s assets minus liabilities (in place of owners’ equity), divided into net assets without donor restrictions and net assets with donor restrictions.

board designation

A limit set by the organization’s own board, not by a donor; the funds remain without donor restrictions.

CORE IDEAS

The story. George Müller (1805–1898), a German-born pastor in Bristol, England, opened a home for orphan children in 1836. He resolved never to ask anyone for money, but to pray and to trust God to provide, and to publish an exact account of every gift received and every penny spent. His orphan houses on Ashley Down, the first opened in 1849, grew to five large buildings caring for about two thousand children at a time, and over his lifetime more than ten thousand orphans were cared for and educated. Every year Müller published a report listing the gifts (without donors’ names, unless they wished) and the expenses, so that anyone could see how the money had been used.

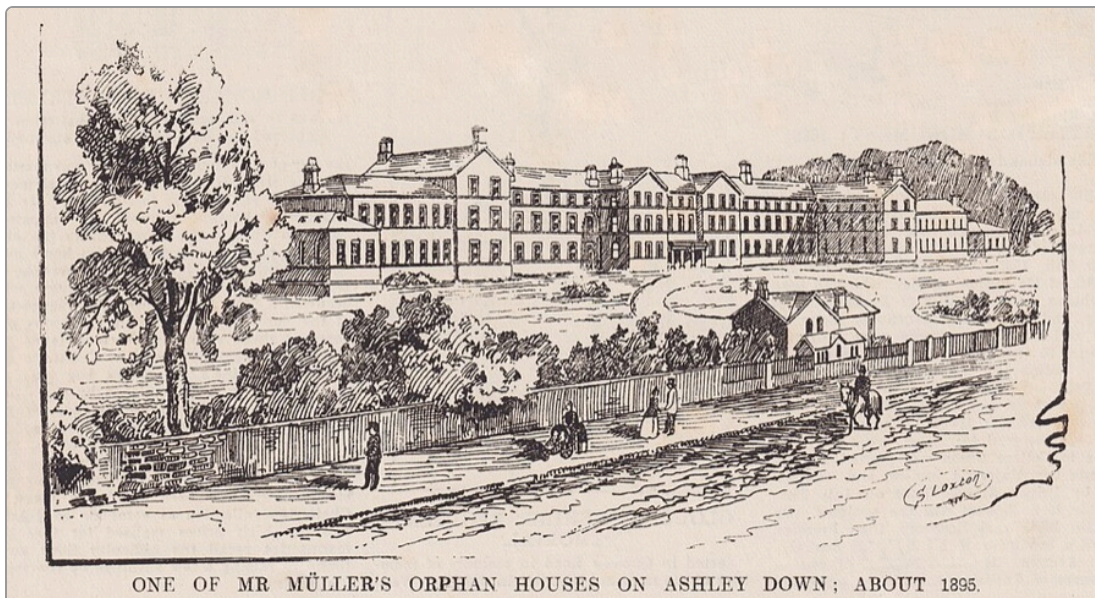
How they figured it out. Müller understood that a ministry that depends on gifts must be above suspicion. His reports showed that gifts designated for a purpose (the orphans, Bible distribution, missionaries, schools) were used for that purpose, and that no debts were run up. The reports themselves became a testimony that encouraged further giving. Modern nonprofit accounting rests on the same two principles: honor the donor’s intent, and report openly.

The big idea. Nonprofits have no owners, so instead of equity they report **net assets**, in two classes: **without donor restrictions** (available for any purpose of the organization, including board-designated funds) and **with donor restrictions** (limited by the donor to a purpose or time). A restricted gift is recorded as revenue with donor restrictions when received. When it is spent for its purpose, the restriction is released: it moves from “with” to “without” restrictions to match the expense. The **statement of activities** shows revenues, expenses and the change in each class of net assets, and the **statement of financial position** replaces the balance sheet. Many churches also keep **fund accounting**, with separate balances for each designated fund.

In business today. Charities, churches, schools and hospitals all keep nonprofit accounts. Donors and watchdog groups look at how much of each dollar goes to the mission rather than to administration and fundraising. A church treasurer who keeps restricted funds separate, reports clearly to the congregation and has the books reviewed each year follows Müller’s example, and Paul’s (Lesson 5.3).

Think it through. “Every man according as he purposeth in his heart, so let him give; not grudgingly, or of necessity: for God loveth a cheerful giver” (2 Corinthians 9:7). Cheerful givers are helped by faithful treasurers: honest accounts let people give with confidence.

PICTURE STUDY



The Müller Orphan Houses, Ashley Down, Bristol, Samuel Loxton, 1895 · Drawing (reproduced in print) · Bristol, England

Image: [Wikimedia Commons](#), public domain

By the 1870s Müller's five orphan houses on Ashley Down housed about two thousand children. Each building was paid for, without debt, from gifts recorded and reported in his annual accounts.

Look closely

- Count the buildings and their windows.
- Look at the grounds. Where might children play or work in gardens?
- Notice how plain the buildings are.
- Find the walls and gates.

Talk about it

1. What records would Müller need to show that gifts for the orphans were used for the orphans?
2. Why would publishing every year's accounts encourage people to keep giving?
3. How is a church treasurer today a steward in the same way?

PROJECT

Statements for a Church or Ministry

You will prepare a year's statement of activities and statement of financial position for a small church or ministry, using real published figures (with permission) or the sample.

You will need

- A church's or charity's published annual report or budget summary, with a parent's help, or the sample in the steps
- Spreadsheet

Steps

1. If your church publishes an annual financial summary, ask permission to use it. Otherwise use the sample: general offerings \$240,000; gifts for missions \$40,000; gifts for the building fund \$60,000; missions spending \$35,000; building repairs paid from the fund \$45,000; salaries \$130,000; utilities and maintenance \$42,000; programs \$28,000; administration \$14,000; beginning net assets: without restrictions \$50,000, with restrictions \$20,000.
2. Record the year's activity in summary entries, including the release of restrictions.
3. Prepare a statement of activities with columns for without and with donor restrictions.
4. Compute ending net assets in each class.
5. Compute the share of total expenses that went to programs and missions.
6. Write a one-page report to the congregation, in the spirit of Müller's reports: what was given, how it was used, and what remains restricted.
7. If you used real figures, show your work to the treasurer only if invited, and keep it private.

Tips

- Releases move net assets between classes; they are not new revenue in total.
- Keep the donors' purposes front and center in your report.

Check your work

- ☐ For the sample: change without restrictions = $240,000 + 80,000 \text{ released} - 294,000 \text{ expenses} = +26,000$; with restrictions = $100,000 - 80,000 = +20,000$.
- ☐ Ending net assets: without \$76,000; with \$40,000; total \$116,000.
- ☐ My report explains clearly how restricted gifts were used.

LEDGER NOTEBOOK

1. Draw the two classes of net assets as two buckets, with an arrow for released restrictions.
2. Copy the statement of activities from Worked Example 2.
3. Write 2 Corinthians 9:7.

KEY FORMULAS

Net assets = Assets – Liabilities

Change in net assets = Revenues and gains – Expenses

From history. Müller's published narratives were read around the world and have never gone out of print. His orphan houses on Ashley Down served as children's homes until 1958; the George Müller Charitable Trust continues his work in Bristol today.

WORKED EXAMPLES

Example 1. A church receives \$180,000 of general offerings and \$25,000 given for missions during the year. It spends \$20,000 of the missions gifts on missionary support. Journalize (in summary) and show the effect on each class of net assets.

Show solution

1. General offerings: Debit Cash \$180,000; credit Contributions–Without Donor Restrictions \$180,000.
2. Missions gifts: Debit Cash \$25,000; credit Contributions–With Donor Restrictions \$25,000.
3. Missions spending: Debit Missions Expense \$20,000; credit Cash \$20,000.
4. Release of restriction: Debit Net Assets Released–With Donor Restrictions \$20,000; credit Net Assets Released–Without Donor Restrictions \$20,000.
5. With donor restrictions: $+25,000 - 20,000 \text{ released} = +\$5,000$ remaining for missions.

Answer: \$5,000 of missions gifts remain restricted; \$20,000 was released to match the missions expense.

Example 2. The church's other expenses for the year are: salaries \$95,000; building and utilities \$38,000; ministry programs \$22,000; administration \$9,000. Prepare a simple statement of activities.

Show solution

1. Without donor restrictions: contributions $180,000 + \text{released } 20,000 = \$200,000$. Expenses: missions $20,000 + \text{salaries } 95,000 + \text{building } 38,000 + \text{programs } 22,000 + \text{administration } 9,000 = \$184,000$. Change: $+\$16,000$.
2. With donor restrictions: contributions $25,000 - \text{released } 20,000 = +\$5,000$.
3. Total change in net assets: $16,000 + 5,000 = \$21,000$.

Answer: Change in net assets: $+\$16,000$ without restrictions, $+\$5,000$ with restrictions; total $+\$21,000$.

Example 3. The church board sets aside \$30,000 of unrestricted money as a “roof fund.” A donor separately gives \$10,000 “for the new roof only.” How is each classified?

Show solution

1. The board’s \$30,000 is a board designation: still net assets without donor restrictions (the board could change its mind).
2. The donor’s \$10,000 is net assets with donor restrictions until spent on the roof.

Answer: Board-designated \$30,000 stays unrestricted; the donor’s \$10,000 is restricted.

PRACTICE

1. **Easy** What replaces owners’ equity in nonprofit statements?

Show answer

Net assets.

2. **Easy** Name the two classes of net assets.

Show answer

Without donor restrictions and with donor restrictions.

3. **Easy** What did George Müller publish each year, and why?

Show answer

An exact account of gifts received and money spent, so anyone could see how the gifts were used and the work stayed above suspicion.

4. **Medium** Journalize receiving a \$5,000 gift restricted to the youth camp.

Show answer

Dr Cash 5,000; Cr Contributions–With Donor Restrictions 5,000.

5. **Medium** The camp spends \$3,500 of that gift. Journalize the expense and the release.

Show answer

Dr Camp Expense 3,500, Cr Cash 3,500; Dr Net Assets Released–With Restrictions 3,500, Cr Net Assets Released–Without Restrictions 3,500.

6. **Medium** What is the difference between a board designation and a donor restriction?

Show answer

A designation is set by the board and can be changed by it (still unrestricted); a restriction is set by the donor and binds the organization.

7. **Medium** A charity's expenses are programs \$640,000, administration \$90,000, fundraising \$70,000. What percent goes to programs?

Show answer

$640 \div 800 = 80\%$.

8. **Hard** Unrestricted contributions \$300,000; restricted contributions \$60,000; restrictions released \$45,000; expenses \$320,000. Change in each class of net assets?

Show answer

Without: $300,000 + 45,000 - 320,000 = +25,000$. With: $60,000 - 45,000 = +15,000$.
Total +40,000.

9. **Hard** A treasurer uses \$8,000 of building-fund gifts (donor-restricted) to cover a shortfall in salaries. What is wrong, and what should be done?

Show answer

It violates the donors' restriction; the money must be restored to the building fund and the board and donors informed; future shortfalls must be met honestly (cut costs or appeal openly).

10. **Hard** Why are nonprofits often judged by the share of spending that goes to programs, and what is a limit of that measure?

Show answer

It shows how much reaches the mission; but some administration is necessary for good stewardship, and a very low figure can mean poor controls.

11. **Challenge** Explain how 2 Corinthians 9:7 and 2 Corinthians 8:20-21 together describe the duties of givers and of treasurers.

Show answer

Givers should give willingly and cheerfully; treasurers should handle gifts so that no one can blame them, honest before God and men; faithful accounting serves cheerful giving.

COMMON MISTAKES

- Treating a board designation as a donor restriction.
- Spending restricted gifts on other needs.
- Forgetting the release entry when restricted gifts are spent.

Make it a game • Release the Restriction. Make two envelopes, net assets without and with donor restrictions. Your parent hands you gifts marked unrestricted, for the building fund, or board-designated. Sort each and record it. Then spend a restricted gift for its purpose and journalize the release of restriction. Finish with a short statement of activities, in the spirit of George Müller's published reports.

Scripture. “Every man according as he purposeth in his heart, so let him give; not grudgingly, or of necessity: for God loveth a cheerful giver.” (2 Corinthians 9:7, KJV)

Givers who give cheerfully are served by treasurers who account faithfully; honest records let people give with confidence.

PARTNERSHIPS AND CORPORATIONS

Businesses are owned in different ways, and each form of ownership needs its own accounting. This unit begins with the partnerships of the Medici Bank, whose branch managers shared in the profits under written agreements, and teaches how partnerships record capital and divide income. Then it turns to the corporation, from the Dutch East India Company of 1602, the first company with permanent, freely traded shares, to the corporations of today, and to the stock traded since the Buttonwood Agreement of 1792.

You will issue stock, compute preferred dividends, declare and pay dividends, and prepare a statement of retained earnings, with the famous case of Henry Ford and the Dodge brothers (1919) as a study in whether to pay out profits or reinvest them. The unit ends with nonprofit and church accounting and the example of George Müller, who cared for thousands of orphans without asking anyone for money and published an exact account of every gift.

PREREQUISITES

- The statement of owner's equity and closing entries (Units 3–4)
- Percents and ratios

MASTERY CHECKLIST

- ☐ I can record partners' investments and divide partnership income using salaries, interest and a ratio.
- ☐ I can explain the features of a corporation and present stockholders' equity.
- ☐ I can journalize stock issues and compute cumulative preferred dividends.
- ☐ I can journalize dividends and prepare a statement of retained earnings.
- ☐ I can record restricted and unrestricted contributions and prepare a simple statement of activities.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- ***Principles of Accounting, Volume 1 (OpenStax), Chapters 14–15***: Free. Corporation accounting and partnership accounting, with additional problems.
- ***A Narrative of Some of the Lord's Dealings with George Müller***: Free on Project Gutenberg (four parts). Müller's own account of the orphan work, including the yearly reports of gifts and expenses. Read a few pages with Lesson 8.5. Ages 13 and up.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

8.1 Partnerships: The Medici Model

3 sessions of 50 minutes

8.2 The Corporation: From the Dutch East India Company to Today

3 sessions of 50 minutes

8.3 Stock: Issuing Shares from Buttonwood to Today

3 sessions of 50 minutes

8.4 Dividends and Retained Earnings: Ford versus the Dodge Brothers

3 sessions of 50 minutes

8.5 Nonprofit and Church Accounting: George Müller's Reports

3 sessions of 50 minutes

UNIT 8 TEST

Calculators are allowed. Show your work. Every journal entry must balance. Answer concept questions and the essay in complete sentences. The test is worth 100 points.

1. **5 pts**

Name three differences between a general partnership and a corporation.

2. **5 pts**

Journalize: Kay invests \$30,000 cash and a truck worth \$18,000 in a new partnership.

3. **8 pts**
Partners X and Y: salaries \$20,000 and \$16,000; 10% interest on capitals of \$50,000 and \$30,000; remainder 2:1. Net income \$62,000. Divide it.
4. **6 pts**
Same agreement, net income \$35,000. Divide it.
5. **5 pts**
What made the VOC's capital and shares new in 1602?
6. **6 pts**
Journalize issuing 20,000 shares of \$2 par common at \$12.
7. **5 pts**
Journalize issuing 5,000 shares of \$1 par common for land with a fair value of \$60,000.
8. **8 pts**
6,000 shares of 7%, \$100 par cumulative preferred; dividends one year in arrears; \$100,000 declared this year. Divide between preferred and common.
9. **6 pts**
Journalize declaring a \$0.30 dividend on 300,000 shares, and its payment.
10. **6 pts**
Beginning RE \$310,000; net income \$120,000; dividends \$90,000. Prepare the calculation for the statement of retained earnings.
11. **6 pts**
Prepare total stockholders' equity: common stock \$60,000; APIC \$540,000; retained earnings \$340,000. Book value per share for 60,000 shares?
12. **4 pts**
What did the court decide in Dodge v. Ford (1919)?
13. **6 pts**
A ministry receives \$12,000 restricted for Bibles and spends \$9,000 on Bibles. Journalize the receipt, the expense and the release.

14. **6 pts**

Unrestricted contributions \$150,000; restricted \$30,000; released \$22,000; expenses \$165,000. Change in each class of net assets?

15. **18 pts**

Essay: Compare the Medici partnerships, the VOC and George Müller's orphan work as three ways of organizing money for a purpose. For each, explain how the accounts were meant to protect the people who supplied the money, and where that protection succeeded or failed.

ANSWER KEY

1. Liability (unlimited vs limited); transferability of ownership; life (ends with a partner's departure vs continuous); taxation (partners taxed vs entity and dividends taxed); management (partners vs board and officers).
2. Dr Cash 30,000; Dr Truck 18,000; Cr Kay, Capital 48,000.
3. Salaries 36,000; interest $5,000 + 3,000$; remainder 18,000 split $12,000 / 6,000$. X: 37,000; Y: 25,000.
4. Remainder $35,000 - 44,000 = -9,000$; $-6,000 / -3,000$. X: 19,000; Y: 16,000.
5. The capital was permanent, and shares could be transferred to other investors on the Amsterdam Exchange; investors had limited liability.
6. Dr Cash 240,000; Cr Common Stock 40,000; Cr APIC 200,000.
7. Dr Land 60,000; Cr Common Stock 5,000; Cr APIC 55,000.
8. Annual 42,000; preferred get 84,000; common 16,000.
9. Dr Retained Earnings 90,000, Cr Dividends Payable 90,000; later Dr Dividends Payable 90,000, Cr Cash 90,000.
10. $310,000 + 120,000 - 90,000 = \$340,000$.
11. Total \$940,000; \$15.67 per share.
12. It ordered a special dividend of about \$19 million but allowed Ford's expansion, deferring to the directors' business judgment.
13. Dr Cash 12,000, Cr Contributions-With Donor Restrictions 12,000. Dr Bible Expense 9,000, Cr Cash 9,000. Dr Net Assets Released-With 9,000, Cr Net Assets Released-Without 9,000.
14. Without: $150,000 + 22,000 - 165,000 = +7,000$. With: $30,000 - 22,000 = +8,000$. Total +15,000.
15. A strong answer explains Medici partnership agreements and capital accounts (protecting the family's capital, failing when managers lent to rulers); the VOC's permanent capital and transferable shares (protecting investors' liability, but with little disclosure and grave wrongs in Asia); and Müller's published accounts (honoring donors' intent and building trust, a success); and draws a conclusion about honest reporting.

PORTFOLIO PIECE: FROM PARTNERSHIP TO CORPORATION

Follow a small business through two forms. In year 1 it is a partnership of two or three partners: write a short agreement, record their investments and divide a year's net income. In year 2 the partners incorporate: issue common and preferred stock in exchange for their capital and new investors' cash, record a year's net income, declare a dividend, and prepare a statement of retained earnings and the stockholders' equity section. Add a one-page appendix that applies the same honesty to a nonprofit the business supports, with a simple statement of activities for a restricted gift.

LOOK FOR	WHAT IT MEANS
Partnership	Clear agreement; correct investment entries and income division.
Incorporation	Correct stock issue entries for cash and noncash contributions; proper equity section.
Dividends and retained earnings	Correct declaration and payment entries and statement of retained earnings.
Nonprofit appendix	Restricted gift recorded and released correctly; brief, honest report.

UNIT 9

ANALYSIS AND AUDITING

Financial statements are only useful if readers can interpret them and trust them. This unit teaches both. You will analyze statements with ratios, following Benjamin Graham, who taught Wall Street after 1929 to read balance sheets instead of rumors, and Donaldson Brown of DuPont, whose 1914 formula breaks return on investment into margin, turnover and leverage.

Then you will study the people who make statements trustworthy: auditors. The McKesson & Robbins fraud of 1938, with its warehouses that did not exist, led auditors to observe inventory and confirm receivables. The Enron collapse of 2001 and the fall of Arthur Andersen led to the Sarbanes-Oxley Act of 2002. The unit ends with careers in accounting, from the first woman CPA in 1899 to the work of accountants today.

PREREQUISITES

- The four financial statements (Unit 4)
- Receivables and inventory (Unit 6)
- Stockholders' equity (Unit 8)
- Ethics and internal control (Unit 5)

MASTERY CHECKLIST

- ☐ I can compute and interpret liquidity and solvency ratios.
- ☐ I can compute profitability ratios and break ROE into the DuPont factors.
- ☐ I can describe the audit process, materiality, confirmation and observation, and the four opinions.
- ☐ I can explain how Enron hid debt and how the Sarbanes-Oxley Act responded.
- ☐ I can describe accounting careers and credentials and make a personal plan.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Occupational Outlook Handbook: Accountants and Auditors (U.S. Bureau of Labor Statistics, at [bls.gov](https://www.bls.gov)):** Free government guide to the occupation's duties, education, pay and outlook. Use with Lesson 9.5.
- **Principles of Accounting, Volume 1 (OpenStax), Chapter 16 and Appendix:** Free. Statement analysis and ratios, with more practice.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

9.1	Ratio Analysis: Liquidity and Solvency	3 sessions of 50 minutes
9.2	Profitability and the DuPont Formula	3 sessions of 50 minutes
9.3	Auditing and the CPA: The McKesson & Robbins Case	3 sessions of 50 minutes
9.4	Enron, Arthur Andersen and the 2002 Reforms	3 sessions of 50 minutes
9.5	Careers in Accounting	3 sessions of 50 minutes

UNIT 9 TEST

Calculators are allowed. Show your work, including each formula. Answer concept questions and the essay in complete sentences. The test is worth 100 points.

1. **6 pts**
Current assets \$150,000 (cash 30,000; receivables 45,000; inventory 70,000; prepaid 5,000); current liabilities \$100,000. Current and quick ratios?
2. **6 pts**
Net sales \$900,000; receivables \$70,000 and \$80,000. Receivables turnover and days' sales?
3. **6 pts**
COGS \$600,000; inventory \$110,000 and \$130,000. Inventory turnover and days?

4. **6 pts**
Total liabilities \$420,000; total assets \$700,000. Debt ratio and debt-to-equity?
5. **4 pts**
Operating income \$150,000; interest \$30,000. Times interest earned?
6. **8 pts**
Net income \$84,000; sales \$1,200,000; average assets \$600,000; average equity \$350,000. Compute margin, asset turnover, ROA, equity multiplier and ROE, and show the DuPont product.
7. **5 pts**
Net income \$2,000,000; preferred dividends \$200,000; 900,000 common shares; price \$30. EPS and P/E?
8. **5 pts**
What did Benjamin Graham and Donaldson Brown each contribute to financial analysis?
9. **6 pts**
Income before taxes \$3,200,000; materiality 5%. A sample of receivables worth \$400,000 contains \$12,000 of overstatement; total receivables \$2,500,000. Is the projected misstatement material?
10. **6 pts**
What happened at McKesson & Robbins, and what two audit procedures followed?
11. **4 pts**
Name and define the four kinds of audit opinion.
12. **6 pts**
Reported assets \$50 billion and liabilities \$35 billion; controlled entities hold \$12 billion of debt and \$5 billion of assets. Consolidated debt ratio and equity?
13. **6 pts**
Name four provisions of the Sarbanes-Oxley Act and the problem each addressed.

14. **4 pts**

Name four accounting career paths and one credential.

15. **16 pts**

Essay: Using McKesson & Robbins and Enron, explain why auditors must be independent and must seek evidence from outside the company. Include a stakeholder view of who was harmed, and connect your answer to 2 Kings 12:15 or Proverbs 22:29.

16. **6 pts**

Explain why a current ratio alone can mislead, with an example.

ANSWER KEY

1. 1.5; $75,000 \div 100,000 = 0.75$.
2. Average 75,000; turnover 12; about 30.4 days.
3. Average 120,000; turnover 5; 73 days.
4. 60%; $420,000 \div 280,000 = 1.5$.
5. 5.0.
6. 7%; 2.0; 14%; about 1.714; 24%. $0.07 \times 2.0 \times 1.714 \approx 0.24$.
7. \$2.00; 15.
8. Graham (with Dodd, *Security Analysis*, 1934) taught investors to judge companies by their statements and ratios; Brown (1914) showed return on investment = margin $\times$ turnover, the DuPont formula.
9. Materiality 160,000; projected misstatement $3\% \times 2,500,000 = 75,000$; not material by itself, but must be combined with other errors and investigated.
10. Officers created fictitious inventory and receivables (about \$19 million); auditors relied on forged documents. Afterwards auditors were required to observe inventory counts and confirm receivables.
11. Unqualified (fair); qualified (fair except for a matter); adverse (not fair); disclaimer (no opinion).
12. Assets 55, liabilities 47; debt ratio $\approx 85.5\%$; equity 8 (versus reported 15).
13. PCAOB (unsupervised auditors); CEO/CFO certification (executives denying knowledge); internal control reports (weak controls); auditor independence limits (consulting conflicts); whistleblower protection (silenced employees); audit committees (weak oversight).
14. Public accounting, management accounting, government, nonprofit, forensic, bookkeeping; CPA, CMA, CIA or EA.
15. A strong answer explains that forged or company-produced documents can deceive, so confirmation and observation are needed; that auditors with financial ties to clients may fail to challenge them (Andersen); lists harms to investors, workers, customers and communities; and connects faithful dealing and diligent, honest work to the verse.
16. It counts all current assets alike; a company whose current assets are mostly slow-moving inventory may have a good current ratio but a poor quick ratio and

be unable to pay bills; year-end window dressing can also improve it temporarily.

PORTFOLIO PIECE: AN ANALYST'S AND AUDITOR'S REPORT ON A REAL COMPANY

Choose a real public company (with a parent) and prepare a 3–5 page report: two years of liquidity, solvency and profitability ratios with a DuPont breakdown; a comparison with one competitor; a summary of the auditor's report and two notes to the statements; a list of the three largest risks named in the 10-K; and a stakeholder scorecard. End with what you would want to examine further if you were the company's auditor. This is a study, not an investment recommendation.

LOOK FOR	WHAT IT MEANS
Ratios	Liquidity, solvency and profitability ratios correct for two years, with DuPont factors.
Comparison	Meaningful comparison with a competitor, citing numbers.
Audit perspective	Accurate summary of the auditor's opinion and notes; sensible areas for further audit work.
Stakeholders and writing	Scorecard with reasons and evidence; clear, honest writing that admits limits.

9.1 RATIO ANALYSIS: LIQUIDITY AND SOLVENCY

OBJECTIVES

- Compute and interpret liquidity ratios: the current ratio, quick ratio, receivables turnover and days' sales, and inventory turnover and days' inventory.
- Compute and interpret solvency ratios: the debt ratio, debt-to-equity and times interest earned.
- Explain how Benjamin Graham taught investors and lenders to read balance sheets with ratios.

Warm-up. Two neighbors each owe \$10,000. One has \$15,000 in the bank; the other has \$2,000 in the bank and a \$300,000 house. Which can pay a bill due next week more easily? Which is richer? Write why those are different questions.

WATCH

FINANCIAL RATIOS: How to Analyze Financial Statements

Accounting Stuff • 23:56

https://www.youtube.com/watch?v=3W_LwpeG8c8

WHEN TO WATCH

After the big idea; watch the liquidity and solvency sections now and the profitability section with Lesson 9.2.

BACKUP VIDEO

3 Liquidity Ratios You Should Know

Accounting Stuff • 5:37

https://www.youtube.com/watch?v=4_GoWaMLGHI

Before the practice set, for the three liquidity ratios.

KEY TERMS

liquidity

The ability to pay debts as they come due in the near term.

solvency

The ability to survive over the long term: to carry and repay long-term debt.

quick (acid-test) ratio

(Cash + short-term investments + receivables) ÷ current liabilities: liquidity without counting inventory and prepaid items.

debt ratio

Total liabilities ÷ total assets: the share of assets financed by creditors.

times interest earned

Operating income (earnings before interest and taxes) ÷ interest expense: how many times interest is covered.

turnover

How many times a year an asset is converted: receivables collected, or inventory sold and replaced.

CORE IDEAS

The story. Benjamin Graham was a young analyst on Wall Street in the 1910s and 1920s, when most investors bought stocks on tips and rumors. Graham studied companies' financial statements instead, line by line. After the crash of 1929 he and David Dodd, both teaching at Columbia University, published *Security Analysis* (1934), which taught investors and lenders to judge a company by its accounts: how much it owned, how much it owed, how much it earned, and whether it could pay its debts. Graham suggested, for example, that an industrial company's current assets should usually be at least twice its current liabilities.

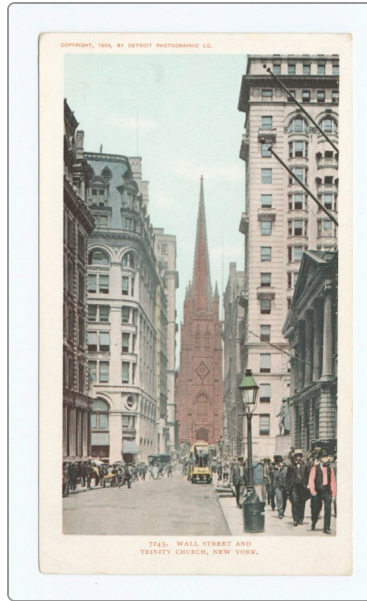
How they figured it out. Raw numbers mean little by themselves. A company with \$1 million of current liabilities might be in danger or perfectly safe, depending on its current assets. Analysts therefore compare figures as **ratios**, and compare the ratios with the same company's past and with similar companies. Ratios turn a balance sheet and income statement into answers: Can it pay this year's bills? Can it carry its debts? How quickly does it collect and sell?

The big idea. **Liquidity:** current ratio = current assets ÷ current liabilities; quick ratio = (cash + short-term investments + receivables) ÷ current liabilities; receivables turnover = net sales ÷ average receivables (days' sales in receivables = 365 ÷ turnover); inventory turnover = COGS ÷ average inventory (days' inventory = 365 ÷ turnover). **Solvency:** debt ratio = total liabilities ÷ total assets; debt-to-equity = total liabilities ÷ total equity; times interest earned = operating income ÷ interest expense. Averages use the beginning and ending balances.

In business today. Loan agreements often require a borrower to keep certain ratios, such as a current ratio above 1.5 or a debt-to-equity ratio below 2; breaking such a promise (a covenant) lets the bank demand repayment. Credit analysts, investors and managers all use ratios. But ratios differ by industry: a grocery chain turns its inventory far faster than a jeweler, and a utility carries more debt than a software company. Compare like with like.

Think it through. Ratios are tools, not verdicts. They point to questions; the notes, the cash-flow statement and a visit to the business answer them. Graham himself warned against trusting any single number.

PICTURE STUDY



Wall Street and Trinity Church, New York, Unknown photographer, about 1900–1915 · Photograph (print) · New York Public Library

Image: [Wikimedia Commons](#), public domain

Wall Street runs from the East River to Trinity Church. Benjamin Graham began his career here in 1914, in a world of tips and rumors, and taught a generation to read the financial statements instead.

Look closely

- Find the church spire at the end of the street.
- Look at the office buildings. What businesses might be inside?
- Look at the people. What are they doing?
- Notice how narrow the street is.

Talk about it

1. What does it mean that the street of finance ends at a church?
2. Why would an analyst trust a company's audited statements more than a tip heard on this street?
3. Which ratios would a lender in one of these buildings check first before a short-term loan?

PROJECT

Ratio Analysis of Two Real Companies

You will compute liquidity and solvency ratios for two real public companies in the same industry from their annual reports and compare them. This is a study, not an investment recommendation.

You will need

- Two annual reports or 10-Ks (with a parent's help, from the companies' websites or the SEC's EDGAR)
- Spreadsheet

Steps

1. Choose two companies in the same industry (two grocery chains, two railroads, two hardware retailers).
2. From each balance sheet (two years) and income statement, copy the figures needed for the seven ratios in this lesson.
3. Compute each ratio for both companies for the latest year, and the current ratio and debt ratio for the prior year too.
4. Make a comparison table and a bar chart.
5. For each ratio, write one sentence on which company looks stronger and why.
6. Read the liquidity section of each company's MD&A and note anything that explains the differences.
7. Write a one-page memo as a lender: to which company would you rather make a short-term loan, and why?

Tips

- Use the same definitions for both companies.
- Watch the units (thousands or millions).

Check your work

- ☐ All seven ratios are computed correctly for both companies.
- ☐ My comparison sentences cite the numbers.

- My memo uses at least four ratios and one fact from MD&A.

LEDGER NOTEBOOK

1. Make a ratio card: each ratio's formula, what it measures and a "healthy" range, with a note that ranges vary by industry.
2. Copy Greenleaf's ratios.
3. Write Graham's rule of thumb for the current ratio.

KEY FORMULAS

$$\begin{aligned}\text{Current ratio} &= \frac{CA}{CL}, & \text{Quick ratio} &= \frac{\text{Cash} + \text{ST inv.} + \text{AR}}{CL} \\ \text{Receivables turnover} &= \frac{\text{Net sales}}{\text{Avg. AR}}, & \text{Days} &= \frac{365}{\text{Turnover}} \\ \text{Inventory turnover} &= \frac{\text{COGS}}{\text{Avg. inventory}} \\ \text{Debt ratio} &= \frac{TL}{TA}, & \frac{D}{E} &= \frac{TL}{TE}, & \text{TIE} &= \frac{\text{Operating income}}{\text{Interest expense}}\end{aligned}$$

From history. Graham taught at Columbia University for nearly thirty years, and several of his students became well-known investors who credited him with teaching them to study a company's statements before buying its shares.

WORKED EXAMPLES

Example 1. Compute Greenleaf Hardware's liquidity ratios. Greenleaf Hardware (Unit 4): current assets \$64,400 (cash 19,800; receivables 9,600; inventory 32,500; prepaid 1,800; supplies 700); current liabilities \$22,000; total liabilities \$82,000; total assets \$191,400 (last year \$181,900); equity \$109,400 (last year \$96,000); receivables last year \$8,100; inventory last year \$29,000; sales \$310,000; cost of goods sold \$186,000; operating income \$48,200; interest expense \$4,800; net income \$43,400.

Show solution

1. Current ratio = $64,400 \div 22,000 \approx 2.93$.
2. Quick ratio = $(19,800 + 9,600) \div 22,000 = 29,400 \div 22,000 \approx 1.34$.
3. Average receivables = $(8,100 + 9,600) \div 2 = 8,850$; receivables turnover = $310,000 \div 8,850 \approx 35.0$; days' sales $\approx 365 \div 35.0 \approx 10.4$ days (most sales are for cash).
4. Average inventory = $(29,000 + 32,500) \div 2 = 30,750$; inventory turnover = $186,000 \div 30,750 \approx 6.05$; days' inventory ≈ 60.3 days.

Answer: Current 2.93; quick 1.34; receivables collected in about 10 days; inventory held about 60 days.

Example 2. Compute Greenleaf's solvency ratios.

Show solution

1. Debt ratio = $82,000 \div 191,400 \approx 0.428$, or 42.8%.
2. Debt-to-equity = $82,000 \div 109,400 \approx 0.75$.
3. Times interest earned = $48,200 \div 4,800 \approx 10.0$.
4. Creditors finance about 43% of assets, and operating income covers interest ten times: a sound position.

Answer: Debt ratio 42.8%; D/E 0.75; TIE 10.0.

Example 3. Two hardware stores each have a current ratio of 2.0. Store A's current assets are mostly cash and receivables; Store B's are 80% inventory, some of it unsold for over a year. Which is more liquid?

Show solution

1. Store A's quick ratio is close to 2.0.
2. Store B's quick ratio is about $2.0 \times 0.20 = 0.4$, and much of its inventory is slow-moving.
3. Store A is far more liquid. The current ratio alone hides the difference.

Answer: Store A; always look at the quick ratio and turnover too.

PRACTICE

1. **Easy** Current assets \$90,000; current liabilities \$60,000. Current ratio?

Show answer

1.5.

2. **Easy** Cash \$12,000; receivables \$18,000; inventory \$40,000; current liabilities \$25,000. Quick ratio?

Show answer

1.2.

3. **Easy** Who wrote *Security Analysis* (1934)?

Show answer

Benjamin Graham and David Dodd.

4. **Medium** Net sales \$720,000; receivables \$55,000 at the start and \$65,000 at the end. Receivables turnover and days' sales?

Show answer

Average 60,000; turnover 12; about 30.4 days.

5. **Medium** COGS \$480,000; inventory \$70,000 and \$90,000. Inventory turnover and days?

Show answer

Average 80,000; turnover 6; about 60.8 days.

6. **Medium** Total liabilities \$350,000; total assets \$500,000. Debt ratio and debt-to-equity?

Show answer

70%; $350,000 \div 150,000 \approx 2.33$.

7. **Medium** Operating income \$84,000; interest \$21,000. Times interest earned?

Show answer

4.0.

8. **Hard** A loan covenant requires a current ratio of at least 1.5. Current assets \$300,000; current liabilities \$210,000. Is the covenant met? What could the company do without dishonesty?

Show answer

1.43, not met. It could collect receivables, convert some short-term debt to long-term by agreement, raise equity or reduce current liabilities by paying them with new long-term financing, and should tell the bank.

9. **Hard** Days' sales in receivables rose from 32 to 51 days while credit terms stayed n/30. What might it mean?

Show answer

Customers are paying more slowly; some receivables may be uncollectible; credit policy or collection may need attention.

10. **Hard** Why might a utility's high debt ratio be less worrying than the same ratio for a restaurant?

Show answer

A utility's revenue is steady and regulated, so it can carry more debt safely; a restaurant's income varies more.

11. **Challenge** A company pays off \$20,000 of current liabilities with cash just before year-end. Current assets were \$100,000 and current liabilities \$80,000. What happens to the current ratio, and why might an analyst be suspicious?

Show answer

Before 1.25; after $80,000 \div 60,000 \approx 1.33$. The improvement is cosmetic ("window dressing"); an analyst would look at ratios across the year and the cash-flow statement.

COMMON MISTAKES

- Using ending balances when averages are called for.
- Including inventory in the quick ratio.
- Judging a ratio without comparing it to the industry or the company's own history.

Make it a game • Liquidity and Solvency Duel. Your parent writes a mini balance sheet and income figures. Both of you race to compute the current ratio, quick ratio, debt ratio and times interest earned. Whoever finishes correctly first earns two points, second earns one. Then each of you explains aloud what the numbers say about the company's ability to pay short-term and long-term debts.

9.2 PROFITABILITY AND THE DUPONT FORMULA

OBJECTIVES

- Compute profit margin, asset turnover, return on assets, return on equity and earnings per share.
- Break return on equity into margin, turnover and leverage with the DuPont formula, as Donaldson Brown did in 1914.
- Compare companies with different business models using these ratios.

Warm-up. A jeweler earns 30¢ on each dollar of sales; a grocery store earns 2¢. Which is the better business? Write what else you would need to know.

WATCH

DuPont analysis explained

The Finance Storyteller • 6:20

<https://www.youtube.com/watch?v=bhbDDSoHJ84>

WHEN TO WATCH

After the story and before the worked examples.

BACKUP VIDEO

6 Profitability Ratios You Should Know

Accounting Stuff • 9:45

<https://www.youtube.com/watch?v=YxUK0nzf6eg>

Before the practice set.

KEY TERMS

net profit margin

Net income ÷ net sales.

asset turnover

Net sales ÷ average total assets: sales generated per dollar of assets.

return on assets (ROA)

Net income ÷ average total assets.

return on equity (ROE)

Net income ÷ average owners' equity: the return earned on the owners' investment.

equity multiplier (leverage)

Average total assets ÷ average equity:
how much of the assets are financed
with debt rather than equity.

earnings per share (EPS)

(Net income – preferred dividends) ÷
weighted-average common shares
outstanding.

CORE IDEAS

The story. In 1914 a young electrical engineer working in the treasurer’s office of the DuPont company, Donaldson Brown, was asked to explain why some of the company’s many operations earned more than others. He noticed that the return on the money invested in a business depends on two things multiplied together: how much profit it earns on each dollar of sales, and how many dollars of sales it produces from each dollar invested. His chart, later called the DuPont formula, let managers see exactly where a business was strong or weak. When DuPont took a large stake in General Motors after 1917, Brown moved to GM, where his methods became central to the company’s management under Alfred Sloan.

How they figured it out. Brown’s insight explains the warm-up. A jeweler may earn 30¢ on a dollar of sales but sell its inventory only once or twice a year; a grocer earns 2¢ but turns its inventory every few weeks. Return on investment = margin × turnover. A business can succeed with high margins and low turnover, or low margins and high turnover. A third factor was added later: **leverage**, the use of borrowed money, which magnifies the return to owners (and the risk).

The big idea. $ROE = \frac{NI}{Sales} \times \frac{Sales}{Avg. assets} \times \frac{Avg. assets}{Avg. equity}$: profit margin × asset turnover × equity multiplier. The first two together give return on assets. A high ROE can come from good margins, efficient use of assets, or heavy borrowing; the DuPont breakdown shows which. For corporations, **earnings per share** and the **price-earnings ratio** (market price ÷ EPS) are also widely reported.

In business today. Managers use the DuPont breakdown to set goals: a store can raise its ROE by improving margins (better buying, fewer markdowns), by improving turnover (less idle inventory, faster collection), or by borrowing. Analysts compare the parts across competitors. A rising ROE driven only by more debt deserves a hard look, because leverage works in both directions.

Think it through. The parable of the talents praises the servants who put their master’s money to work and gained a return (Matthew 25:14-30). Return on assets

asks the same question of a business: what did you do with what was entrusted to you?

PICTURE STUDY



Marshall Field & Co.'s Retail Store, Chicago, Unknown photographer (Newberry Library collection), about 1900–1910 · Photograph or postcard · Newberry Library, Chicago

Image: [Wikimedia Commons](#), public domain

Marshall Field & Company was one of the great department stores of the early twentieth century, famous for service, quality and its motto, “Give the lady what she wants.”

Look closely

- Count the floors. How much inventory might such a store hold?
- Find the awnings and the display windows.
- Look at the street: streetcars, wagons, shoppers.
- Look for the store’s name or clock.

Talk about it

1. Would a department store like this earn high margins or high turnover? Why?
2. How would its ROA compare with a grocery store’s, and why might both be good businesses?
3. What could the store do to raise its asset turnover?

PROJECT

A DuPont Comparison

You will compute DuPont breakdowns for two real companies with different business models and explain how each earns its return.

You will need

- Annual reports for two companies with different models (for example, a warehouse-club retailer and a jewelry or luxury-goods company), with a parent's help
- Spreadsheet

Steps

1. Choose two companies with very different margins.
2. Copy net income, sales, total assets (two years) and total equity (two years) for each.
3. Compute margin, asset turnover, ROA, equity multiplier and ROE for each.
4. Check that $\text{margin} \times \text{turnover} \times \text{multiplier} = \text{ROE}$.
5. Compute EPS from the reports and check it against the company's reported EPS.
6. Make a chart of the three DuPont factors for both companies.
7. Write a page: how does each company earn its return, and which faces more risk from leverage?

Tips

- Use averages of beginning and ending assets and equity.
- Reported EPS may differ slightly because of share counts; note any difference.

Check your work

- ☐ My DuPont factors multiply to ROE for both companies.
- ☐ My explanation identifies each company's main driver of return.
- ☐ I comment on leverage risk.

LEDGER NOTEBOOK

1. Draw the DuPont formula as a tree: ROE branching into margin, turnover and multiplier.
2. Copy the jeweler-and-grocer comparison.
3. Write one sentence connecting ROA to the parable of the talents.

KEY FORMULAS

$$\text{ROA} = \text{Margin} \times \text{Asset turnover} = \frac{\text{NI}}{\text{Avg. assets}}$$

$$\text{ROE} = \text{Margin} \times \text{Turnover} \times \text{Equity multiplier}$$

$$\text{EPS} = \frac{\text{NI} - \text{Preferred dividends}}{\text{Avg. common shares}}, \quad P/E = \frac{\text{Price}}{\text{EPS}}$$

From history. Donaldson Brown also helped develop the budgeting and “standard volume” cost methods that let General Motors plan production and prices across its divisions in the 1920s, making GM the model of the large, decentralized corporation.

WORKED EXAMPLES

Example 1. Compute Greenleaf Hardware's profitability ratios and its DuPont breakdown. Greenleaf Hardware (Unit 4): current assets \$64,400 (cash 19,800; receivables 9,600; inventory 32,500; prepaid 1,800; supplies 700); current liabilities \$22,000; total liabilities \$82,000; total assets \$191,400 (last year \$181,900); equity \$109,400 (last year \$96,000); receivables last year \$8,100; inventory last year \$29,000; sales \$310,000; cost of goods sold \$186,000; operating income \$48,200; interest expense \$4,800; net income \$43,400.

Show solution

1. Net margin = $43,400 \div 310,000 = 14.0\%$.
2. Average assets = $(181,900 + 191,400) \div 2 = 186,650$; asset turnover = $310,000 \div 186,650 \approx 1.66$.
3. ROA = $43,400 \div 186,650 \approx 23.3\%$ ($= 14.0\% \times 1.66$).
4. Average equity = $(96,000 + 109,400) \div 2 = 102,700$; equity multiplier = $186,650 \div 102,700 \approx 1.82$.
5. ROE = $43,400 \div 102,700 \approx 42.3\%$ ($= 14.0\% \times 1.66 \times 1.82$).

Answer: Margin 14.0%; turnover 1.66; ROA 23.3%; multiplier 1.82; ROE 42.3%.
(A proprietorship's ROE is high partly because the owner's own salary is not an expense.)

Example 2. Compare a jeweler (sales \$2,000,000, net income \$200,000, average assets \$4,000,000) with a grocer (sales \$20,000,000, net income \$400,000, average assets \$5,000,000).

Show solution

1. Jeweler: margin 10%; turnover 0.5; ROA 5%.
2. Grocer: margin 2%; turnover 4.0; ROA 8%.
3. The grocer's thin margin is more than made up by its turnover.

Answer: Jeweler ROA 5%; grocer ROA 8%.

Example 3. A corporation has net income of \$1,250,000, preferred dividends of \$50,000, and an average of 400,000 common shares outstanding. Its stock trades at \$45. Compute EPS and the P/E ratio.

Show solution

1. $\text{EPS} = (1,250,000 - 50,000) \div 400,000 = \$3.00.$

2. $\text{P/E} = 45 \div 3.00 = 15.$

Answer: EPS \$3.00; P/E 15.

PRACTICE

1. Easy Net income \$60,000; sales \$800,000. Net margin?

Show answer

7.5%.

2. Easy Sales \$800,000; average assets \$400,000. Asset turnover?

Show answer

2.0.

3. Easy Who devised the DuPont formula, and when?

Show answer

Donaldson Brown, at DuPont, in 1914.

4. Medium Using Problems 1 and 2, compute ROA.

Show answer

15%.

5. Medium Average assets \$400,000; average equity \$250,000. Equity multiplier and ROE (net income \$60,000)?

Show answer

1.6; 24%.

6. Medium Net income \$900,000; preferred dividends \$100,000; 500,000 common shares. EPS?

Show answer

\$1.60.

7. Medium EPS \$1.60; price \$28. P/E?

Show answer

17.5.

8. **Hard** Two firms each have ROE of 20%. Firm A: margin 10%, turnover 1.0, multiplier 2.0. Firm B: margin 4%, turnover 1.25, multiplier 4.0. Which carries more risk, and why?

Show answer

Firm B, because its ROE depends on heavy leverage (assets four times equity); a small fall in income could wipe out its thin equity.

9. **Hard** A store's margin is 3% and turnover 2.5. Management can raise margin to 3.5% or turnover to 3.0. Which raises ROA more?

Show answer

Now 7.5%. Margin to 3.5%: 8.75%. Turnover to 3.0: 9.0%. Raising turnover helps slightly more.

10. **Hard** Why does the lesson say Greenleaf's ROE is high partly because it is a proprietorship?

Show answer

The owner's own work is not paid as salary expense, so net income includes the reward for his labor as well as for his capital.

11. **Challenge** Show that $ROE = ROA \times \text{equity multiplier}$, and explain why borrowing raises ROE only if the return on assets exceeds the interest rate.

Show answer

$NI/E = (NI/A) \times (A/E)$. Borrowed money adds assets; if those assets earn more than the interest cost, the extra profit goes to owners; if less, owners' return falls.

COMMON MISTAKES

- Using ending instead of average assets or equity.
- Thinking a high ROE is always good, without checking leverage.
- Forgetting to subtract preferred dividends in EPS.

Make it a game • DuPont Breakdown Duel. Your parent gives sales, net income, assets and equity for two pretend companies. First guess which has the higher return on equity. Then compute margin, asset turnover and the equity multiplier, as Donaldson Brown did in 1914, and multiply them. Which of the three explains the difference? Winner is the closer guess and the correct breakdown.

9.3 AUDITING AND THE CPA: THE MCKESSON & ROBBINS CASE

OBJECTIVES

- Describe the purpose of an independent audit and the steps of the audit process.
- Explain materiality, sampling, confirmation and observation, and the four kinds of audit opinion.
- Tell how the McKesson & Robbins fraud of 1938 changed auditing standards.

Warm-up. Your friend says she has \$400 saved in a jar at home. How could you check that, without simply taking her word for it? List three ways.

WATCH

The Audit Process

Edspira • 6:41

<https://www.youtube.com/watch?v=cODdJvE1RCE>

WHEN TO WATCH

After the big idea.

BACKUP VIDEO

Internal Audit vs External Audit

Edspira • 3:16

<https://www.youtube.com/watch?v=P1VVzshSSig>

Before the practice set.

KEY TERMS

audit

An independent examination of financial statements by a CPA to give an opinion on whether they are presented fairly, in all material respects, under GAAP.

materiality

An amount large enough that its misstatement could change the decisions of a reasonable reader of the statements.

confirmation

Obtaining written evidence directly from an outside party, such as a customer confirming the balance it owes or a bank confirming a deposit.

observation

The auditor watching a process, such as the client's physical count of inventory.

sampling

Testing a sample of items to draw a conclusion about the whole, since checking every transaction is usually impractical.

unqualified opinion

A "clean" opinion that the statements are fairly presented. Others are qualified (fair except for a matter), adverse (not fair) and a disclaimer (no opinion).

CORE IDEAS

The story. McKesson & Robbins was a large, respected drug wholesaler. Its president, who called himself F. Donald Coster, was in fact Philip Musica, a man with a past criminal record who had changed his name. For years he and his brothers ran a fictitious crude-drug business inside the company: invoices from imaginary suppliers, sales to imaginary customers, and inventory in warehouses that did not exist. When the fraud was exposed in December 1938, the company's statements were found to include about \$19 million of fictitious inventory and receivables, about a fifth of its reported assets. The auditors, a respected firm, had checked the documents carefully, but the documents were fakes. They had never gone to look at the inventory or asked the customers to confirm what they owed.

How they figured it out. The Securities and Exchange Commission held hearings, and the accounting profession responded. In 1939 the American Institute of Accountants issued its first Statement on Auditing Procedure, requiring auditors, where practicable, to **observe** the client's physical inventory count and to **confirm** receivables directly with customers. The lesson was simple: evidence from outside the company, and evidence the auditor sees with his own eyes, is stronger than documents the company produces.

The big idea. An audit follows a pattern. **Planning:** understand the business, its risks and its internal controls; set **materiality** (for example, 5% of income before taxes). **Testing controls:** see whether the controls work. **Substantive testing:** gather evidence for the balances, by sampling transactions, confirming receivables and

cash, observing inventory counts, recomputing and inspecting documents, and analyzing ratios for anything unusual. **Reporting:** issue an opinion. An audit gives *reasonable*, not absolute, assurance; it is designed to catch material misstatements, not every small error.

In business today. Every public company must be audited each year by an independent CPA firm registered with the Public Company Accounting Oversight Board (Lesson 9.4). Banks often require audits or reviews of their larger business borrowers, and many charities and churches have an annual audit or review. Internal auditors, employed by the company itself, test controls and operations year-round and report to the board.

Think it through. In the reign of King Joash, the money given to repair the temple was handed to the overseers of the work, and “they reckoned not with the men... for they dealt faithfully” (2 Kings 12:15). Trust can be earned by a record of faithfulness; an audit is how that trust is verified among strangers.

PICTURE STUDY



The Securities and Exchange Commission in Session, Harris & Ewing, late 1930s · Photograph (glass negative) · Library of Congress, Prints and Photographs Division

Image: [Wikimedia Commons](#), public domain

The SEC was created in 1934 to enforce the new securities laws. In 1939 it held hearings on the McKesson & Robbins fraud, which led to stronger auditing standards.

Look closely

- Count the commissioners. How are they arranged?
- Look for papers, books or files on the table.
- Look at the room. Is it grand or plain?
- Read the caption if it is visible.

Talk about it

1. Why would a government commission care how private accountants audit a company?
2. What questions might the commissioners have asked the McKesson & Robbins auditors?
3. How do audits serve investors who will never meet the company's managers?

PROJECT

Audit a Small Set of Books

You will act as an auditor for a small set of books (your own Unit 2–3 books or a family-supervised record) and write an audit report.

You will need

- A set of books you or a classmate kept earlier in the course, with source documents
- Ledger notebook
- A helper to act as the “client”

Steps

1. Choose the books to audit and ask your helper to act as the client’s manager.
2. Plan: list the accounts and set materiality at 5% of net income (or 1% of total assets if there was a loss).
3. Assess controls: ask how cash was handled and who recorded what (Lesson 5.3).
4. Choose a sample of ten transactions and trace each from source document to journal to ledger.
5. “Confirm” two balances with an outside source (a bank statement, a real customer or supplier, or the helper acting as one).
6. Observe or recount any inventory or supplies.
7. Compute two ratios and compare them with the prior period; explain any large change.
8. List any misstatements found, their total, and whether they are material.
9. Write an audit report with an opinion (unqualified, qualified, adverse or disclaimer) and a short letter to management with recommendations.

Tips

- Document everything you test, as auditors keep working papers.
- Be fair: describe errors factually, not as accusations.

Check your work

- ☐ My working papers show the sample, the tracing and the confirmations.
- ☐ I computed materiality and compared misstatements with it.
- ☐ My opinion follows from the evidence.

LEDGER NOTEBOOK

1. Draw the audit process as four steps: plan, test controls, test balances, report.
2. Make a table of the four opinions with an example of each.
3. Write 2 Kings 12:15.

KEY FORMULAS

Planning materiality $\approx 5\% \times \text{Income before taxes}$

From history. The McKesson & Robbins company survived the fraud, was reorganized, and continues today as a major health-care distributor. Its accountants agreed to return a large part of their fees, and the case is still taught in every auditing course.

WORKED EXAMPLES

Example 1. An auditor sets materiality at 5% of income before taxes of \$2,400,000. A misstatement of \$90,000 is found in inventory. Is it material?

Show solution

1. Materiality = $0.05 \times 2,400,000 = \$120,000$.
2. \$90,000 is below \$120,000, so on its own it may not be material; but the auditor must add it to all other misstatements found, and consider whether it suggests fraud, which could make even a smaller amount important.

Answer: Materiality \$120,000; \$90,000 is below it but must be considered with other errors and its cause.

Example 2. An auditor sends confirmation requests to 40 customers chosen by sampling, whose balances total \$480,000 out of total receivables of \$1,600,000. Replies confirm \$462,000; customers dispute \$18,000. Estimate the possible misstatement in all receivables.

Show solution

1. Error rate in the sample = $18,000 \div 480,000 = 3.75\%$.
2. Projected to the population: $0.0375 \times 1,600,000 = \$60,000$.
3. The auditor investigates the disputed items, considers whether \$60,000 could be material, and may expand testing.

Answer: Projected misstatement about \$60,000.

Example 3. Match each situation with the type of audit opinion: (a) statements fairly presented; (b) fair except that the company refused to let the auditor observe one warehouse's inventory, which is material but not pervasive; (c) statements leave out large liabilities and are misleading as a whole; (d) the auditor could not obtain enough evidence to form any opinion.

Show solution

1. (a) Unqualified (clean).
2. (b) Qualified ("except for").
3. (c) Adverse.
4. (d) Disclaimer of opinion.

Answer: Unqualified; qualified; adverse; disclaimer.

PRACTICE

1. Easy What is the purpose of an independent audit?

Show answer

To give an opinion on whether the statements are fairly presented under GAAP, so outside readers can trust them.

2. **Easy** What two procedures were required after the McKesson & Robbins fraud?

Show answer

Observing the physical inventory count and confirming receivables directly with customers.

3. **Easy** Name the four kinds of audit opinion.

Show answer

Unqualified, qualified, adverse, disclaimer.

4. **Medium** Income before taxes \$860,000; materiality 5%. Materiality threshold?

Show answer

\$43,000.

5. **Medium** Why is a customer's written confirmation stronger evidence than the company's own invoice?

Show answer

It comes directly from an independent outside party, not from the company being audited.

6. **Medium** Why does an audit give reasonable but not absolute assurance?

Show answer

Auditors test samples and rely on judgment; collusion and forgery can hide fraud; testing everything would be impractical.

7. **Medium** What did 2 Kings 12:15 say about the overseers of the temple repairs?

Show answer

They did not need to be audited ("reckoned with") because they dealt faithfully.

8. **Hard** A sample of inventory items worth \$250,000 shows overstatements of \$5,000. Total inventory is \$3,000,000. Projected misstatement?

Show answer

$2\% \times 3,000,000 = \$60,000.$

9. **Hard** Why could the McKesson auditors be fooled even though they checked every document carefully?

Show answer

The documents were forged by the company's own officers; without outside evidence (observation, confirmation), forged documents look genuine.

10. **Hard** Give an example of an analytical procedure that might reveal fictitious sales.

Show answer

Comparing gross margin, receivables turnover or days' sales with prior years and competitors; a sudden jump in sales and receivables without matching cash collections is a warning.

11. **Challenge** A company's receivables grew 40% while sales grew 5%, and confirmations from three large customers came back "address unknown." What should the auditor do?

Show answer

Treat it as a serious fraud risk: verify the customers' existence independently, expand confirmations, examine subsequent cash receipts and shipping records, consult with the audit committee, and withhold a clean opinion until resolved.

COMMON MISTAKES

- Thinking an audit checks every transaction.
- Relying on documents produced by the client when outside evidence is available.
- Ignoring small misstatements that may signal fraud.

Make it a game • Audit Detective. Your parent writes five claims from a small company's books, such as a stock of goods in a warehouse, customer balances and a bank balance. Pick the right audit procedure to test each: confirmation, observation or sampling. Remember the McKesson and Robbins fraud. Then your parent describes outcomes, and you name the audit opinion, such as unqualified, you would issue.

Scripture. “Moreover they reckoned not with the men, into whose hand they delivered the money to be bestowed on workmen: for they dealt faithfully.” (2 Kings 12:15, KJV)

Trust is earned by a record of faithful dealing. Among strangers, an audit is how that record is verified.

9.4 ENRON, ARTHUR ANDERSEN AND THE 2002 REFORMS

OBJECTIVES

- Explain how Enron used off-balance-sheet entities and aggressive accounting to hide debt and inflate profits.
- Describe the collapse of Enron (2001) and of Arthur Andersen (2002), and who was harmed.
- Summarize the main provisions of the Sarbanes-Oxley Act of 2002.

Warm-up. If a company showed you a balance sheet with \$10 billion of debt, but had another \$20 billion of debt held in separate companies it secretly controlled, what would you want the law to require?

WATCH

Enron Accounting Scandal Explained! A Frequent Accounting Interview Question!

The Financial Controller • 6:58

<https://www.youtube.com/watch?v=SMT5v5zT5KQ>

WHEN TO WATCH

After the story and before the big idea; it explains the accounting tricks in plain terms.

BACKUP VIDEO

The Sarbanes Oxley Act of 2002

Edspira • 10:34

<https://www.youtube.com/watch?v=eeQagPytR-o>

With the last core idea on the 2002 reforms.

KEY TERMS

special purpose entity (SPE)

A separate company set up for a narrow purpose; legitimate in many uses, but Enron used some to move debt and losses off its own balance sheet.

restatement

Reissuing previously published statements to correct material errors.

off-balance-sheet financing

Borrowing in a way that keeps the debt off the company's balance sheet.

Sarbanes-Oxley Act (2002)

The U.S. law that created the PCAOB, required executives to certify financial reports, required reports on internal control, and strengthened auditor independence.

PCAOB

The Public Company Accounting Oversight Board, which registers, inspects and sets standards for auditors of public companies.

CORE IDEAS

The story. In the 1990s Enron, a Houston pipeline company, remade itself into an energy-trading firm and became one of the most admired companies in America; its reported revenue made it the seventh-largest U.S. company in 2000. Its stock rose to about \$90 a share. But its reported profits depended on aggressive accounting: it recorded the expected profits of long-term contracts up front, and it set up hundreds of special partnerships, some run by its own finance chief, to hold debts and losing investments that it kept off its balance sheet. In October 2001 Enron announced large losses and a reduction of shareholders' equity of about \$1.2 billion; in November it restated four years of profits. On December 2, 2001, it filed for bankruptcy, then the largest in American history.

How they figured it out. Enron's auditor, Arthur Andersen, one of the five largest accounting firms in the world, had earned large fees from Enron for both auditing and consulting. When the SEC began investigating, members of Andersen's Houston

office shredded tons of Enron documents. In June 2002 Andersen was convicted of obstructing justice; although the Supreme Court overturned the conviction in 2005, the firm had already lost its clients and collapsed, and its roughly 85,000 employees worldwide had to find other work. Several Enron executives were later convicted of fraud. About 20,000 Enron employees lost their jobs, and many lost their retirement savings, which had been heavily invested in Enron stock.

The big idea. Congress responded with the **Sarbanes-Oxley Act**, signed in July 2002. Its main provisions: the **PCAOB** to oversee auditors of public companies; **certification** by the chief executive and chief financial officer that the reports are fair, with criminal penalties for knowingly false certification; management's annual **report on internal control**, tested by the auditor for larger companies; **auditor independence**, forbidding auditors to provide many consulting services to audit clients and requiring audit partners to rotate; independent **audit committees** of the board; and protection for **whistleblowers**. Accounting rules for special entities were also tightened so that companies must consolidate entities they effectively control.

In business today. Public companies spend heavily on internal controls and audits as a result of the 2002 law; most observers credit it with improving the reliability of financial reporting. Debates about its costs, especially for smaller companies, are a matter for policy courses; this lesson treats the law as settled history. The deeper lessons are older than any law: substance over form, independence of the auditor, and the courage to say no.

Who gained? Enron scorecard. Financiers: 1, shareholders and lenders lost tens of billions of dollars. Risk-takers: 1, the company was destroyed and executives went to prison. Builders: 2, real pipelines and power plants were sold to other companies. Workers: 1, jobs and retirement savings lost. Customers: 2, some energy contracts were manipulated. Community: 1, Houston lost a major employer and charity donor, and public trust in markets was shaken.

PICTURE STUDY



The New York Stock Exchange on Broad Street, Detroit Publishing Company, about 1904–1910 ·

Photograph · Library of Congress, Prints and Photographs Division

Image: [Wikimedia Commons](#), public domain

The exchange's building, opened in 1903, has seen many booms and collapses. In 2001 Enron's shares, traded here, fell from about \$90 to under \$1 within a year.

Look closely

- Find the columns and the sculpted pediment above them.
- Find the neighboring tall buildings.
- Look at the people in the street.
- Look at the size of the building compared with them.

Talk about it

1. Investors who bought Enron shares here relied on its audited statements. Who failed them?
2. Why does a stock exchange depend on honest accounting more than on grand buildings?
3. Which Sarbanes-Oxley provision would most have protected Enron's investors?

PROJECT

An Enron Case Study

You will write a case study of the Enron collapse from an accountant's point of view, using the lesson and at least two reputable sources.

You will need

- Library or internet access with a parent (encyclopedias, the SEC's and FBI's published histories, reputable newspaper archives)
- Ledger notebook

Steps

1. Read at least two reputable accounts of the Enron collapse (avoid sites that are mainly opinion).
2. Make a timeline from 1985 (Enron formed) to 2006, including the restatement, the bankruptcy, Andersen's conviction and the Sarbanes-Oxley Act.
3. Explain in plain words, with a simple numerical example, how moving debt into controlled entities changed Enron's balance sheet.
4. Explain the auditor-independence problem.
5. Write the stakeholder scorecard with reasons.
6. Match each Enron problem with the reform that addresses it.
7. Write a one-page reflection: what would you have done as a junior accountant at Enron or Andersen who saw something wrong? Use the six-step method from Lesson 5.5.

Tips

- Stick to facts that appear in more than one reputable source.
- Avoid sensational detail; focus on the accounting and the moral lesson.

Check your work

- ☐ My timeline and example are accurate.
- ☐ My scorecard has a reason for each stakeholder.
- ☐ My reflection applies the six-step method honestly.

LEDGER NOTEBOOK

1. Draw Enron and its special entities as boxes, with the hidden debt drawn in red.
2. Make a table: Enron problem | Sarbanes-Oxley provision.
3. Write the Enron stakeholder scorecard.

KEY FORMULAS

$$\text{Debt ratio} = \frac{\text{Total liabilities}}{\text{Total assets}}$$

From history. After Andersen's collapse, the largest accounting firms went from five to four, often called the "Big Four." The PCAOB began inspecting audit firms in 2003.

WORKED EXAMPLES

Example 1. A company reports total assets of \$60 billion and total liabilities of \$40 billion. It controls special entities holding another \$15 billion of debt and \$9 billion of assets that should be consolidated. Compute the debt ratio and equity before and after consolidation.

Show solution

1. Reported: debt ratio = $40 \div 60 \approx 66.7\%$; equity = $60 - 40 = \$20$ billion.
2. Consolidated: assets $60 + 9 = 69$; liabilities $40 + 15 = 55$; debt ratio $\approx 79.7\%$; equity = $69 - 55 = \$14$ billion.
3. Hidden losses of \$6 billion ($15 - 9$) were never shown in equity.

Answer: Debt ratio rises from 66.7% to 79.7%; equity falls from \$20 billion to \$14 billion.

Example 2. A company signs a 10-year contract expected to earn total profit of \$50 million, \$5 million a year. Compare recognizing the whole \$50 million in year 1 with recognizing it over 10 years, and say which is consistent with revenue recognition.

Show solution

1. Up front: year-1 profit +\$50 million; years 2–10 show nothing from the contract (and any shortfall in later years becomes a loss).
2. Over time: \$5 million a year as the service is delivered.
3. Revenue should be recognized as it is earned by performing; booking estimated future profits immediately overstates current results, as Enron did.

Answer: Recognize \$5 million a year as earned, not \$50 million up front.

Example 3. Under Sarbanes-Oxley, which provision addresses each Enron problem? (a) The auditor earned large consulting fees from its audit client. (b) Executives later said they did not know about the accounting. (c) Losses were hidden in entities the company controlled. (d) An employee who raised concerns had little protection.

Show solution

1. (a) Auditor independence: limits on non-audit services and partner rotation.
2. (b) CEO and CFO certification of reports, with penalties.
3. (c) Internal control reporting and tightened consolidation rules.
4. (d) Whistleblower protection.

Answer: Independence; certification; internal control and consolidation; whistleblower protection.

PRACTICE

1. Easy When did Enron file for bankruptcy?

Show answer

December 2, 2001.

2. Easy What happened to Arthur Andersen?

Show answer

It was convicted in 2002 of obstruction of justice for shredding Enron documents; though the conviction was overturned in 2005, the firm lost its clients and collapsed.

3. Easy Name four main provisions of the Sarbanes-Oxley Act.

Show answer

PCAOB; CEO/CFO certification; internal control reports; auditor independence; audit committees; whistleblower protection.

4. Medium Reported assets \$30 billion; liabilities \$18 billion. Unconsolidated entities hold \$6 billion of debt and \$2 billion of assets. Restate the debt ratio and equity.

Show answer

Before 60%, equity 12; after: assets 32, liabilities 24, debt ratio 75%, equity 8.

5. Medium Why did Andersen's consulting fees from Enron threaten its independence?

Show answer

The firm had a large financial interest in keeping Enron happy, making it harder to challenge Enron's accounting.

6. Medium What does "substance over form" mean in the Enron case?

Show answer

Although the partnerships were legally separate (form), Enron controlled them and bore their risks (substance), so their debts were really Enron's.

7. Medium Why were Enron employees' retirement savings hit so hard?

Show answer

Much of their savings was invested in Enron stock, so the same collapse took both their jobs and their savings; it shows the danger of lack of diversification.

8. **Hard** A company records \$80 million of profit this year from contracts that will be performed over the next eight years. If revenue were recognized as earned evenly, how much belongs to this year? By how much is income overstated?

Show answer

\$10 million; overstated by \$70 million.

9. **Hard** Write a stakeholder scorecard for Enron with one reason for each group.

Show answer

Sample: financiers 1 (billions lost); risk-takers 1 (company destroyed); builders 2 (real assets survived under new owners); workers 1 (jobs and savings lost); customers 2 (manipulated markets); community 1 (Houston lost an employer; public trust shaken).

10. **Hard** How does Proverbs 21:6 (“The getting of treasures by a lying tongue is a vanity tossed to and fro of them that seek death”) apply to Enron?

Show answer

Profits reported through deception were illusory; they vanished and brought ruin to the company and harm to thousands.

11. **Challenge** Compare Enron with the Kreuger collapse of 1932 (Lesson 5.4). Name two similarities and one difference.

Show answer

Similarities: complex webs of related entities hiding debt and losses; admired leaders and investors who did not demand transparency. Difference: Enron was subject to audit and securities laws (which failed through lack of independence and aggressive rules), while Kreuger operated largely before such laws existed.

COMMON MISTAKES

- Thinking all special purpose entities are fraudulent; many are legitimate when properly disclosed and consolidated.
- Blaming only the executives; auditors, bankers and boards also failed.
- Treating the 2002 reforms as a current public debate rather than settled history.

Make it a game • The Cup Trick Briefing. Use cups to show how an off-balance-sheet entity hides debt. Put beans for debt in your company's cup, then slide them into a special purpose entity cup. Your parent, playing a regulator, tries to spot the trick. Then explain Enron's 2001 collapse, Arthur Andersen's fall, and what the Sarbanes-Oxley Act of 2002 and the PCAOB changed.

9.5 CAREERS IN ACCOUNTING

OBJECTIVES

- Describe the main careers in accounting: public accounting (audit, tax, advisory), industry, government and nonprofit work, and bookkeeping.
- Explain the paths to the CPA and other credentials (CMA, CIA, EA).
- Reflect on accounting as a vocation and plan next steps.

Warm-up. List five organizations in your town that must keep books (a church, a hardware store, a farm, a school, the town government...). Who keeps them? Have you met that person?

WATCH

What to Do with Accounting Degree

Edspira • 4:45

https://www.youtube.com/watch?v=DhD2RaZ_vAM

WHEN TO WATCH

After the core ideas.

KEY TERMS

public accounting

Accounting firms that serve clients: audit and assurance, tax preparation and planning, and advisory services.

management (industry) accounting

Accountants employed by a business: staff accountant, cost accountant, controller, chief financial officer.

CMA, CIA, EA

Certified Management Accountant (management accounting), Certified Internal Auditor (internal audit), Enrolled Agent (licensed to represent taxpayers before the IRS).

forensic accounting

Investigating financial records for evidence of fraud or for legal disputes.

CORE IDEAS

The story. In 1899 Christine Ross, a Nova Scotia-born accountant working in New York, became the first woman certified as a CPA in the United States, after earning one of the highest scores on the New York examination of 1898. The examiners

hesitated over her certificate for more than a year because no woman had held one; she received it, and practiced for decades, serving clients in the fashion and garment trades. She is remembered as one of thousands of quiet, careful people who made accounting a trusted profession.

How they figured it out. As businesses, governments and charities grew, they needed people who could keep and check their accounts. The profession developed several paths. **Public accountants** audit companies, prepare taxes and advise clients. **Management accountants** work inside companies, preparing statements, budgets and cost analyses; the head accountant is the controller, and the chief financial officer leads finance. **Government accountants** work for the IRS, auditors general and agencies; the FBI hires accountants as special agents to trace fraud. **Nonprofit and church accountants** serve ministries and charities. **Bookkeepers** keep the daily records of small businesses.

The big idea. The CPA license is the profession's main credential and is required to sign audit opinions. It is granted by each state, generally after a college degree with accounting courses (most states require 150 semester hours of education, and some now offer an alternative path with more work experience), passing the four-part Uniform CPA Examination, and supervised work experience. Other credentials include the CMA for management accountants, the CIA for internal auditors and the EA for tax practitioners. Many students begin with an associate's degree or bookkeeping certificate and work while they study.

In business today. Accountants are needed in every industry and every town, and the work changes with technology: software now does much routine recording, so accountants spend more time on analysis, controls, data and advice. The U.S. Bureau of Labor Statistics publishes a free guide to the occupation, its education and its outlook. The skills you have practiced this year (careful records, honest corrections, clear explanations, and the courage to say no to a dishonest request) are what employers most want.

Think it through. “Seest thou a man diligent in his business? he shall stand before kings; he shall not stand before mean men” (Proverbs 22:29). Whether or not accounting becomes your career, the diligence and honesty it requires will serve you in any calling, and in keeping the books of your own household.

PICTURE STUDY



The Accounting Department of the Grossman-Weinfeld Millinery Company, New Orleans, Covert (photographer), 1917 · Photograph · New Orleans, Louisiana

Image: [Wikimedia Commons](#), public domain

Every business of any size had an accounting department like this one, at a wholesale millinery (hat-making) company in New Orleans. Christine Ross, the first woman CPA, served clients in the same fashion and millinery trades in New York.

Look closely

- Count the clerks and find what each is working on.
- Find ledgers, papers or office machines.
- Look at the room: light, desks, files.
- Look for a supervisor or a desk set apart.

Talk about it

1. Which jobs in this room are now done by software, and which still need people?
2. What would a young clerk here have needed to learn to become the head of the department?
3. How is careful work in a room like this a service to the company's workers, customers and owners?

PROJECT

Explore an Accounting Career

You will research careers in accounting, interview someone in the field, and write a personal plan.

You will need

- The Bureau of Labor Statistics' Occupational Outlook Handbook page on accountants and auditors
- A parent to arrange an interview

Steps

1. Read the BLS Occupational Outlook Handbook page on accountants and auditors (and, if you like, bookkeeping clerks). Note what they do, the education required and the outlook it reports.
2. Look up your state board of accountancy's requirements for the CPA license.
3. With a parent, arrange a 20-minute interview (in person, phone or video) with an accountant, bookkeeper or church treasurer.
4. Ask about a typical day, how they trained, what they wish they had known in high school, and how they handle pressure to bend numbers.
5. Write a summary of the interview and send a thank-you note.
6. Make a four-step personal plan, like Worked Example 3, with realistic timing.
7. Write a one-page reflection on whether accounting could be a calling for you, and what you will do with the skills either way.

Tips

- Prepare questions in advance and listen more than you talk.
- Do not share the interviewee's personal details without permission.

Check your work

- ☐ My research notes cite the BLS page and my state board.
- ☐ My interview summary includes at least five specific things I learned.
- ☐ My plan has concrete steps and dates.

LEDGER NOTEBOOK

1. Draw a career map: public accounting, industry, government, nonprofit, bookkeeping, with two jobs in each.
2. Write the CPA requirements for your state.
3. Write Proverbs 22:29.

From history. The Uniform CPA Examination has been given nationwide since 1917, prepared by the national institute of accountants (today the AICPA). In 2024 it was reorganized into three core sections and one specialty section chosen by the candidate.

WORKED EXAMPLES

Example 1. Match each person with a career path: (a) checks a public company's statements and signs an opinion; (b) prepares monthly statements and budgets for a manufacturer; (c) traces stolen funds for a court case; (d) represents a family before the IRS in a tax matter; (e) keeps the daily books of three small shops.

Show solution

1. (a) Public accounting, audit (CPA required).
2. (b) Management accounting (staff accountant or controller; CMA useful).
3. (c) Forensic accounting.
4. (d) Tax practice (CPA or Enrolled Agent).
5. (e) Bookkeeping.

Answer: Audit; management accounting; forensic; tax; bookkeeping.

Example 2. A student plans the CPA path: a four-year accounting degree (120 semester hours) and needs 150 hours in her state. How many additional hours does she need, and give two ways to earn them.

Show solution

1. Additional hours = $150 - 120 = 30$ (about one year of full-time study).
2. Ways: a master's degree in accounting or taxation; additional undergraduate courses (some taken through community college or dual enrollment, if accepted).

Answer: 30 more hours, for example through a master's degree or additional courses.

Example 3. Plan a personal path from this course to a first accounting job, in four steps with approximate timing.

Show solution

1. Step 1 (now–graduation): finish this course; keep books for a family business, church or club; consider a bookkeeping certificate.
2. Step 2 (college years): an accounting degree; a summer internship at a local CPA firm or business.
3. Step 3 (after graduation): an entry-level job in audit, tax or a company's accounting department; complete the education and experience requirements.
4. Step 4: pass the CPA exam (or CMA/EA) and grow in responsibility.

Answer: A four-step plan; each student's plan will differ.

PRACTICE

1. Easy Who was the first woman CPA in the United States, and when was she certified?

Show answer

Christine Ross, in 1899 (New York).

2. Easy Name the three main services of public accounting firms.

Show answer

Audit and assurance, tax, advisory.

3. Easy What do the letters CMA, CIA and EA stand for?

Show answer

Certified Management Accountant; Certified Internal Auditor; Enrolled Agent.

4. Medium Which credential is required to sign an audit opinion on a public company's statements?

Show answer

The CPA license (practicing with a registered firm).

5. Medium What does a controller do?

Show answer

Leads a company's accounting department: records, statements, budgets, internal control and reporting.

6. Medium Why is the CPA license granted by states rather than by the federal government?

Show answer

Professions such as law, medicine and accounting are licensed by each state; the exam is uniform, but each state sets its own requirements.

7. Medium Name two government jobs that use accountants.

Show answer

IRS revenue agent; FBI special agent (forensic accountant); state or federal auditor; agency budget analyst.

8. Hard How is technology changing accounting work, and which skills become more valuable?

Show answer

Software automates routine recording; analysis, internal control, data skills, communication and judgment become more valuable.

9. **Hard** Interview question: “Tell me about a time you found an error.” Write a short answer using an example from this course.

Show answer

Sample: In my error-detective project I found a transposition by dividing the difference by 9, traced it to the ledger, and corrected it with a single line through and initials.

10. **Hard** Apply Proverbs 22:29 to a bookkeeper at a small business.

Show answer

Diligent, skillful, honest work earns trust and responsibility; the bookkeeper who serves well may be entrusted with greater things.

11. **Challenge** Write a one-paragraph personal statement explaining why accounting (or another career you are considering) could be a calling for you.

Show answer

Answers will vary; strong ones connect gifts, interests and service to others, with honesty about uncertainty.

COMMON MISTAKES

- Thinking accountants only do taxes.
- Assuming software will make accountants unnecessary; it changes the work.
- Waiting until college to practice; you can keep real books now.

Make it a game • Career Clue Cards. Write six career cards: auditor, tax advisor, management accountant, government accountant, bookkeeper and forensic accountant. Your parent acts out or describes a day on the job without naming it. Guess the career and name a credential that fits, such as CPA, CMA, CIA or EA. Then pitch your parent on which path you would like and why.

Scripture. “Seest thou a man diligent in his business? he shall stand before kings; he shall not stand before mean men.” (Proverbs 22:29, KJV)

Diligent, honest work is noticed and trusted. The habits of a good accountant serve well in any calling.

UNIT 9

ANALYSIS AND AUDITING

Financial statements are only useful if readers can interpret them and trust them. This unit teaches both. You will analyze statements with ratios, following Benjamin Graham, who taught Wall Street after 1929 to read balance sheets instead of rumors, and Donaldson Brown of DuPont, whose 1914 formula breaks return on investment into margin, turnover and leverage.

Then you will study the people who make statements trustworthy: auditors. The McKesson & Robbins fraud of 1938, with its warehouses that did not exist, led auditors to observe inventory and confirm receivables. The Enron collapse of 2001 and the fall of Arthur Andersen led to the Sarbanes-Oxley Act of 2002. The unit ends with careers in accounting, from the first woman CPA in 1899 to the work of accountants today.

PREREQUISITES

- The four financial statements (Unit 4)
- Receivables and inventory (Unit 6)
- Stockholders' equity (Unit 8)
- Ethics and internal control (Unit 5)

MASTERY CHECKLIST

- ☐ I can compute and interpret liquidity and solvency ratios.
- ☐ I can compute profitability ratios and break ROE into the DuPont factors.
- ☐ I can describe the audit process, materiality, confirmation and observation, and the four opinions.
- ☐ I can explain how Enron hid debt and how the Sarbanes-Oxley Act responded.
- ☐ I can describe accounting careers and credentials and make a personal plan.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Occupational Outlook Handbook: Accountants and Auditors (U.S. Bureau of Labor Statistics, at [bls.gov](https://www.bls.gov)):** Free government guide to the occupation's duties, education, pay and outlook. Use with Lesson 9.5.
- **Principles of Accounting, Volume 1 (OpenStax), Chapter 16 and Appendix:** Free. Statement analysis and ratios, with more practice.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

9.1	Ratio Analysis: Liquidity and Solvency	3 sessions of 50 minutes
9.2	Profitability and the DuPont Formula	3 sessions of 50 minutes
9.3	Auditing and the CPA: The McKesson & Robbins Case	3 sessions of 50 minutes
9.4	Enron, Arthur Andersen and the 2002 Reforms	3 sessions of 50 minutes
9.5	Careers in Accounting	3 sessions of 50 minutes

UNIT 9 TEST

Calculators are allowed. Show your work, including each formula. Answer concept questions and the essay in complete sentences. The test is worth 100 points.

1. **6 pts**
Current assets \$150,000 (cash 30,000; receivables 45,000; inventory 70,000; prepaid 5,000); current liabilities \$100,000. Current and quick ratios?
2. **6 pts**
Net sales \$900,000; receivables \$70,000 and \$80,000. Receivables turnover and days' sales?
3. **6 pts**
COGS \$600,000; inventory \$110,000 and \$130,000. Inventory turnover and days?

4. **6 pts**
Total liabilities \$420,000; total assets \$700,000. Debt ratio and debt-to-equity?
5. **4 pts**
Operating income \$150,000; interest \$30,000. Times interest earned?
6. **8 pts**
Net income \$84,000; sales \$1,200,000; average assets \$600,000; average equity \$350,000. Compute margin, asset turnover, ROA, equity multiplier and ROE, and show the DuPont product.
7. **5 pts**
Net income \$2,000,000; preferred dividends \$200,000; 900,000 common shares; price \$30. EPS and P/E?
8. **5 pts**
What did Benjamin Graham and Donaldson Brown each contribute to financial analysis?
9. **6 pts**
Income before taxes \$3,200,000; materiality 5%. A sample of receivables worth \$400,000 contains \$12,000 of overstatement; total receivables \$2,500,000. Is the projected misstatement material?
10. **6 pts**
What happened at McKesson & Robbins, and what two audit procedures followed?
11. **4 pts**
Name and define the four kinds of audit opinion.
12. **6 pts**
Reported assets \$50 billion and liabilities \$35 billion; controlled entities hold \$12 billion of debt and \$5 billion of assets. Consolidated debt ratio and equity?
13. **6 pts**
Name four provisions of the Sarbanes-Oxley Act and the problem each addressed.

14. **4 pts**

Name four accounting career paths and one credential.

15. **16 pts**

Essay: Using McKesson & Robbins and Enron, explain why auditors must be independent and must seek evidence from outside the company. Include a stakeholder view of who was harmed, and connect your answer to 2 Kings 12:15 or Proverbs 22:29.

16. **6 pts**

Explain why a current ratio alone can mislead, with an example.

ANSWER KEY

1. 1.5; $75,000 \div 100,000 = 0.75$.
2. Average 75,000; turnover 12; about 30.4 days.
3. Average 120,000; turnover 5; 73 days.
4. 60%; $420,000 \div 280,000 = 1.5$.
5. 5.0.
6. 7%; 2.0; 14%; about 1.714; 24%. $0.07 \times 2.0 \times 1.714 \approx 0.24$.
7. \$2.00; 15.
8. Graham (with Dodd, *Security Analysis*, 1934) taught investors to judge companies by their statements and ratios; Brown (1914) showed return on investment = margin $\times$ turnover, the DuPont formula.
9. Materiality 160,000; projected misstatement $3\% \times 2,500,000 = 75,000$; not material by itself, but must be combined with other errors and investigated.
10. Officers created fictitious inventory and receivables (about \$19 million); auditors relied on forged documents. Afterwards auditors were required to observe inventory counts and confirm receivables.
11. Unqualified (fair); qualified (fair except for a matter); adverse (not fair); disclaimer (no opinion).
12. Assets 55, liabilities 47; debt ratio $\approx 85.5\%$; equity 8 (versus reported 15).
13. PCAOB (unsupervised auditors); CEO/CFO certification (executives denying knowledge); internal control reports (weak controls); auditor independence limits (consulting conflicts); whistleblower protection (silenced employees); audit committees (weak oversight).
14. Public accounting, management accounting, government, nonprofit, forensic, bookkeeping; CPA, CMA, CIA or EA.
15. A strong answer explains that forged or company-produced documents can deceive, so confirmation and observation are needed; that auditors with financial ties to clients may fail to challenge them (Andersen); lists harms to investors, workers, customers and communities; and connects faithful dealing and diligent, honest work to the verse.
16. It counts all current assets alike; a company whose current assets are mostly slow-moving inventory may have a good current ratio but a poor quick ratio and

be unable to pay bills; year-end window dressing can also improve it temporarily.

PORTFOLIO PIECE: AN ANALYST'S AND AUDITOR'S REPORT ON A REAL COMPANY

Choose a real public company (with a parent) and prepare a 3–5 page report: two years of liquidity, solvency and profitability ratios with a DuPont breakdown; a comparison with one competitor; a summary of the auditor's report and two notes to the statements; a list of the three largest risks named in the 10-K; and a stakeholder scorecard. End with what you would want to examine further if you were the company's auditor. This is a study, not an investment recommendation.

LOOK FOR	WHAT IT MEANS
Ratios	Liquidity, solvency and profitability ratios correct for two years, with DuPont factors.
Comparison	Meaningful comparison with a competitor, citing numbers.
Audit perspective	Accurate summary of the auditor's opinion and notes; sensible areas for further audit work.
Stakeholders and writing	Scorecard with reasons and evidence; clear, honest writing that admits limits.

UNIT 10

MANAGERIAL ACCOUNTING

Financial accounting reports to outsiders what has happened. Managerial accounting helps the people inside a business decide what to do next. This unit begins with counting the cost (Luke 14:28) and Henry Ford's use of volume and cost behavior to cut the Model T's price from \$850 to about \$260, then follows Andrew Carnegie's daily cost sheets into job and process costing.

You will build budgets on the pattern of Joseph's seven years of plenty, evaluate investments with present value as Benjamin Franklin did when he left £1,000 to Boston and Philadelphia to be lent for two hundred years, and finish the course with a capstone: a complete set of books and an analysis for a small candy business, in the spirit of Milton Hershey, who failed several times, learned from his records, and gave his fortune to a school for orphans. A final exam on the whole course follows this unit.

PREREQUISITES

- The full accounting cycle and statements (Units 3–4)
- Ratios (Unit 9)
- Exponents and spreadsheet formulas

MASTERY CHECKLIST

- ☐ I can classify costs, separate mixed costs and compute break-even, target-profit volume and margin of safety.
- ☐ I can cost a job with a predetermined overhead rate and cost a process with equivalent units.
- ☐ I can prepare sales, production and cash budgets and compare actual results with a flexible budget.
- ☐ I can compute present and future values and evaluate an investment with payback and NPV.
- ☐ I can keep a complete set of books for a small business and analyze them for its stakeholders.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Principles of Accounting, Volume 2: Managerial Accounting (OpenStax, Rice University)**: Free. Cost behavior, job and process costing, budgeting and capital budgeting, with practice problems. Ages 15 and up.
- **GnuCash**: Free. Optional for the capstone practice set: keep Weaver Fudge's books in GnuCash alongside your hand-prepared books and compare the reports.
- **The Way to Wealth, by Benjamin Franklin (1758)**: Free on Project Gutenberg. Franklin's sayings on thrift and industry; a fitting companion to Lesson 10.4 and his long-term gift to Boston and Philadelphia.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

10.1 Cost Behavior and Break-Even: Counting the Cost	3 sessions of 50 minutes
10.2 Job and Process Costing: Carnegie's Cost Sheets	3 sessions of 50 minutes
10.3 Budgets: Joseph's Seven Years	3 sessions of 50 minutes
10.4 Capital Decisions and Present Value: Franklin's 200-Year Gift	3 sessions of 50 minutes
10.5 Capstone: Milton Hershey and a Small Business's Books	3 sessions of 50 minutes

UNIT 10 TEST

Calculators are allowed. Show your work, including each formula. Answer concept questions and the essay in complete sentences. The test is worth 100 points.

1. **4 pts**

Classify as fixed, variable or mixed: factory rent; raw materials; a phone bill with a base fee plus usage; sales commissions.

2. **8 pts**
Price \$60; variable cost \$36; fixed costs \$48,000. Compute CM per unit, CM ratio, break-even units and sales.
3. **5 pts**
Using Problem 2, units to earn \$24,000 profit, and the margin of safety if 2,500 units are planned.
4. **5 pts**
Maintenance cost \$5,200 at 1,000 hours and \$8,200 at 2,500 hours. High-low variable rate and fixed portion?
5. **6 pts**
Estimated overhead \$360,000; estimated direct labor hours 24,000. A job uses \$3,400 materials and 50 labor hours at \$24. Overhead rate and job cost?
6. **8 pts**
A department completes 9,000 units; 3,000 in ending WIP are 40% complete for conversion; materials added at start. Materials cost \$36,000; conversion \$51,000. Equivalent units, unit costs, cost of completed units and ending WIP.
7. **6 pts**
Budgeted sales 2,400 units; desired ending inventory 360; beginning 300. Units to produce? If each unit needs 2 lb of material at \$3, with no material inventories, the materials cost?
8. **7 pts**
Beginning cash \$12,000. Collections: 50% in month, 50% next month. Sales: May \$40,000, June \$60,000. June payments \$58,000. Minimum cash \$10,000. Ending June cash and any borrowing?
9. **5 pts**
Flexible budget: \$5 variable per unit plus \$30,000 fixed. Actual 8,000 units cost \$72,500. Flexible budget and variance?
10. **5 pts**
FV of \$4,000 at 6% for 8 years? PV of \$10,000 in 5 years at 8%?

11. **8 pts**

A machine costs \$36,000 and saves \$10,000 a year for 5 years; required rate 10% (annuity factor 3.7908). Payback and NPV? Decision?

12. **5 pts**

What did Franklin's will provide for Boston and Philadelphia, and what did he expect after 100 years?

13. **4 pts**

What did Carnegie require of his managers, and why did it give him an advantage?

14. **18 pts**

Essay: Using Ford, Carnegie, Joseph or Hershey, explain how managerial accounting helps a business serve its stakeholders over the long run. Include at least two tools from this unit and one passage of Scripture (Luke 14:28, Proverbs 21:5 or Matthew 25:27).

15. **6 pts**

Name four checks that show a complete set of books is internally consistent.

ANSWER KEY

1. Fixed; variable; mixed; variable.
2. \$24; 40%; 2,000 units; \$120,000.
3. 3,000 units; 20%.
4. \$2.00 per hour; \$3,200.
5. \$15 per DLH; $3,400 + 1,200 + 750 = \$5,350$.
6. Materials EU 12,000 $\rightarrow$ \$3.00; conversion EU 10,200 $\rightarrow$ \$5.00. Completed $9,000 \times 8 = 72,000$; WIP $9,000 + 6,000 = 15,000$; total 87,000.
7. 2,460 units; 4,920 lb; \$14,760.
8. Collections $30,000 + 20,000 = 50,000$; cash before borrowing 4,000; borrow 6,000; ending 10,000.
9. 70,000; \$2,500 unfavorable.
10. $\approx \$6,375$; $\approx \$6,806$.
11. 3.6 years; PV 37,908; NPV \$1,908; accept.
12. £1,000 each, lent at 5% to young married craftsmen; he expected about £131,000 after 100 years, part for public works and the rest lent again for another century.
13. Daily cost sheets showing the cost of each department's output; knowing exact costs let him price aggressively, invest in better processes and catch waste.
14. A strong answer explains, with accurate history, how break-even and cost knowledge (Ford, Carnegie), budgets (Joseph) or careful records and reinvestment (Hershey) allowed lower prices, steadier jobs and lasting gifts; names the stakeholders served and any who were not; and applies the verse to counting the cost, diligent planning or faithful stewardship.
15. Every journal entry balances; the trial balance (and adjusted and post-closing trial balances) balance; net income on the income statement equals the amount closed to capital and shown on the statement of owner's equity; the balance sheet balances with ending capital; the cash-flow statement's net change equals the change in the balance-sheet cash; subsidiary ledgers agree with control accounts (any four).

PORTFOLIO PIECE: THE CAPSTONE BOOKS

Present the complete books of the capstone business (Weaver Fudge or your own, with approval) for one quarter: journals, ledgers, monthly trial balances, worksheets, monthly and quarterly statements, closing entries and post-closing trial balance. Add a managerial section: break-even analysis, a three-month cash budget, one NPV decision, and ratio analysis. End with a two-page letter to a banker or investor and a stakeholder report, and a one-paragraph reflection on what this course taught you about honesty and stewardship.

LOOK FOR	WHAT IT MEANS
Complete, balanced books	Every month's journals, ledgers and trial balances complete and balanced; corrections honest.
Statements	Monthly and quarterly statements properly headed, articulating, with cash flows proved.
Managerial analysis	Break-even, cash budget, NPV and ratios correct and clearly explained.
Letter and stakeholder report	A clear, honest case for the business's strengths and risks, with all six stakeholders considered.
Reflection	A thoughtful paragraph connecting the work to honesty and stewardship.

10.1 COST BEHAVIOR AND BREAK-EVEN: COUNTING THE COST

OBJECTIVES

- Classify costs as fixed, variable or mixed, and separate a mixed cost with the high-low method.
- Compute contribution margin, the contribution margin ratio, break-even point, target-profit volume and margin of safety.
- Explain how Henry Ford used volume and cost behavior to cut the Model T's price.

Warm-up. Your youth group sells hot chocolate at a fall fair. The booth fee is \$60, and each cup costs 40¢ to make. You charge \$2. How many cups must you sell before you make any money at all? Work it out.

WATCH

Cost Volume Profit Analysis (CVP): calculating the Break Even Point

Edspira • 7:14

<https://www.youtube.com/watch?v=Nw2lioF6Lc>

WHEN TO WATCH

After the big idea and before the worked examples.

BACKUP VIDEO

MA22 - Breakeven Point and CVP Analysis - Explained

Tony Bell • 11:00

<https://www.youtube.com/watch?v=tuKLU6aQnJg>

Before the practice set.

KEY TERMS

managerial accounting

Accounting information prepared for managers inside a business to plan, control and decide, rather than for outside readers.

fixed cost

A cost that stays the same in total within a range of activity (rent, salaries, insurance, depreciation).

variable cost

A cost that changes in total in proportion to activity (materials, sales commissions, packaging).

contribution margin

Sales minus variable costs: what is left to cover fixed costs and provide profit. Per unit: price – variable cost per unit.

break-even point

The sales volume at which total revenue equals total costs and profit is zero.

margin of safety

How far sales can fall before the business reaches break-even.

CORE IDEAS

The story. Jesus asked, “For which of you, intending to build a tower, sitteth not down first, and counteth the cost, whether he have sufficient to finish it?” (Luke 14:28). Henry Ford counted costs as few manufacturers ever had. When the Model T was introduced in 1908, its price was \$850. Ford believed that a lower price would sell many more cars, and that making many more cars would lower the cost of each one. The moving assembly line (1913) and huge volume let him cut the price again and again, to about \$260 by the mid-1920s, while the company earned enormous profits.

How they figured it out. Ford’s reasoning rested on cost behavior. Some costs, like the Highland Park plant, its machines and its managers, were **fixed**: they did not change much whether the plant built 100,000 cars or 300,000. Other costs, like steel, tires and paint, were **variable**: they rose with each car built. Spreading fixed costs over more cars lowered the cost per car, as Wedgwood had found with his pottery in 1772. Managers who know which costs are fixed and which are variable can predict profit at any level of sales.

The big idea. **Contribution margin** per unit = price – variable cost per unit. Each unit sold contributes that amount toward fixed costs, and after fixed costs are covered, toward profit. **Break-even units** = fixed costs ÷ contribution margin per unit. **Break-even sales dollars** = fixed costs ÷ contribution margin ratio. To earn a target profit, add it to fixed costs before dividing. **Margin of safety** = (actual or planned sales – break-even sales) ÷ actual sales. Mixed costs, such as a utility bill with a base charge, can be split with the **high-low method**: variable rate = change in cost ÷ change in activity.

In business today. Every business plan includes a break-even analysis, and bankers ask for one. A restaurant owner asks how many meals a night pay the rent; an airline asks how many seats a flight must fill; a church asks how many families a new school must enroll to cover its teachers. The analysis assumes a constant price and constant costs per unit within a range, so it is a planning tool, not a prophecy.

Think it through. Counting the cost is not a lack of faith; Jesus commends it. A builder who counts honestly can start with confidence or wisely decide not to start.

PICTURE STUDY



The Tower of Babel, Pieter Bruegel the Elder, 1563 · Oil on panel · Kunsthistorisches Museum, Vienna

Image: [Wikimedia Commons](#), public domain

Bruegel painted the tower of Genesis 11 as a Flemish building site of his own day, crowded with masons, cranes and supply ships. The tower is enormous and unfinished, and parts of it are already crumbling.

Look closely

- Find the cranes and treadwheels. How did they lift stone?
- Find the ships in the harbor. What might they be bringing?
- Find the king in the foreground. What are the workers doing in front of him?
- Look for places where the tower is unfinished or already decaying.

Talk about it

1. Which costs of this project would be fixed and which would rise with every course of stone?
2. How does Luke 14:28 apply to a builder who starts a tower without counting the cost?
3. What does the unfinished tower suggest about plans made in arrogance rather than wisdom?

PROJECT

Break-Even for a Real Small Venture

You will plan a small real or realistic venture (a bake sale, a garden-produce stand, a craft table at a fair), find its break-even point, and test it.

You will need

- Real prices from receipts or store flyers
- Spreadsheet
- A parent to supervise any actual selling

Steps

1. Choose a product and list its fixed costs (booth fee, sign, equipment) and its variable cost per unit (ingredients, packaging), using real prices.
2. Set a price and compute the contribution margin per unit and ratio.
3. Compute break-even units and sales dollars.
4. Choose a profit goal (for example, a gift to a ministry) and compute the units needed.
5. Build a spreadsheet with a profit chart: units on the horizontal axis, revenue and total cost lines, and their crossing point.
6. Test two changes: a 10% higher price, and a cheaper source of ingredients. Recompute break-even each time.
7. If a parent agrees, actually sell at an event, record units sold and costs, and compare with your plan.
8. Write a paragraph: how close was your plan to reality, and what would you change?

Tips

- Selling food may require local permission; check with a parent first.
- Round break-even units up: you cannot sell part of a cookie.

Check your work

- ☐ My costs come from real prices and are correctly classified.
- ☐ My break-even and target-profit calculations are correct.

☐ My chart shows the break-even point clearly.

LEDGER NOTEBOOK

1. Sketch a cost-volume-profit chart and label fixed costs, total costs, revenue, the break-even point and the profit and loss areas.
2. Write the break-even formulas.
3. Copy Luke 14:28.

KEY FORMULAS

$$\begin{aligned}\text{CM per unit} &= P - VC, & \text{CM ratio} &= \frac{P - VC}{P} \\ \text{Break-even units} &= \frac{\text{Fixed costs}}{\text{CM per unit}}, & \text{Break-even \$} &= \frac{\text{Fixed costs}}{\text{CM ratio}} \\ \text{Units for target profit} &= \frac{\text{Fixed costs} + \text{Target profit}}{\text{CM per unit}} \\ \text{Margin of safety} &= \frac{\text{Sales} - \text{Break-even sales}}{\text{Sales}}\end{aligned}$$

From history. Ford sold about 10,600 Model Ts in its first full sales year and more than two million cars and trucks in 1923. By the time production ended in 1927, more than fifteen million Model Ts had been built.

WORKED EXAMPLES

Example 1. A company makes a product that sells for \$25. Variable costs are \$15 a unit; fixed costs are \$120,000 a month. Find the contribution margin per unit and ratio, break-even units and sales dollars.

Show solution

1. CM per unit = $25 - 15 = \$10$. CM ratio = $10 \div 25 = 40\%$.
2. Break-even units = $120,000 \div 10 = 12,000$ units.
3. Break-even sales = $120,000 \div 0.40 = \$300,000$ ($= 12,000 \times \$25$).

Answer: CM \$10 (40%); break-even 12,000 units or \$300,000.

Example 2. Same company: how many units must it sell to earn \$30,000 a month? If it plans to sell 16,000 units, what is its margin of safety?

Show solution

1. Target units = $(120,000 + 30,000) \div 10 = 15,000$ units.
2. Margin of safety = $(16,000 - 12,000) \div 16,000 = 25\%$.
3. Check profit at 16,000 units: $16,000 \times 10 - 120,000 = \$40,000$.

Answer: 15,000 units for \$30,000 profit; margin of safety 25%.

Example 3. A shop's utility cost was \$3,800 in a month with 2,000 machine hours and \$6,500 in a month with 5,000 hours. Use the high-low method to find the variable rate and fixed portion, and predict the cost at 4,000 hours.

Show solution

1. Variable rate = $(6,500 - 3,800) \div (5,000 - 2,000) = 2,700 \div 3,000 = \$0.90$ an hour.
2. Fixed portion = $3,800 - 0.90 \times 2,000 = 3,800 - 1,800 = \$2,000$.
3. At 4,000 hours: $2,000 + 0.90 \times 4,000 = \$5,600$.

Answer: Cost = \$2,000 + \$0.90 per hour; \$5,600 at 4,000 hours.

PRACTICE

1. Easy Classify as fixed or variable: rent; flour in a bakery; a manager's salary; sales commissions; insurance; packaging.

Show answer

Fixed, variable, fixed, variable, fixed, variable.

2. Easy The warm-up: booth \$60, cost 40¢, price \$2. Break-even cups?

Show answer

$60 \div 1.60 = 37.5$, so 38 cups.

3. Easy What was the Model T's price in 1908 and by the mid-1920s?

Show answer

\$850; about \$260.

4. **Medium** Price \$40; variable cost \$28; fixed costs \$36,000. Break-even units and dollars?

Show answer

CM 12; 3,000 units; \$120,000.

5. **Medium** Same data: units to earn \$18,000 profit?

Show answer

$54,000 \div 12 = 4,500$ units.

6. **Medium** CM ratio 35%; fixed costs \$70,000. Break-even sales?

Show answer

\$200,000.

7. **Medium** Planned sales \$250,000; break-even sales \$200,000. Margin of safety?

Show answer

20%.

8. **Hard** Fixed costs rise by \$6,000 (Problem 4's data). New break-even units? What if the price instead rises to \$43?

Show answer

$42,000 \div 12 = 3,500$ units. With \$43: CM 15; $36,000 \div 15 = 2,400$ units.

9. **Hard** Delivery costs were \$9,200 at 1,500 deliveries and \$12,800 at 2,700 deliveries. Variable rate and fixed portion?

Show answer

$3,600 \div 1,200 = \$3.00$ per delivery; fixed $9,200 - 4,500 = \$4,700$.

10. **Hard** Explain how Ford could lower prices and raise profits at the same time.

Show answer

Lower prices raised volume enormously; with large fixed costs spread over many more cars and efficient production lowering variable cost, total contribution margin grew faster than the price cuts reduced it.

11. **Challenge** A café sells coffee (\$3, variable cost \$0.75) and pastries (\$4, variable \$1.60). Sales mix is 3 coffees for every 1 pastry. Fixed costs are \$9,000 a month. How many of each must it sell to break even?

Show answer

A 'package' of 3 coffees + 1 pastry has CM $3 \times 2.25 + 2.40 = 9.15$. Packages = $9,000 \div 9.15 \approx 983.6$, so 984 packages: 2,952 coffees and 984 pastries.

COMMON MISTAKES

- Dividing fixed costs by the price instead of the contribution margin.
- Forgetting to round break-even units up.
- Treating a cost as fixed when it really changes with volume.

Make it a game • Break-Even Estimation Duel. Your parent sets a pretend venture: fixed costs of 400, a price of 8 and a variable cost of 3. Both of you guess the break-even units before calculating. Then compute the contribution margin, break-even point, units for a target profit and margin of safety at 150 units. The closer guess wins the round. Try a mixed-cost split with the high-low method.

Scripture. “For which of you, intending to build a tower, sitteth not down first, and counteth the cost, whether he have sufficient to finish it?” (Luke 14:28, KJV)

Break-even analysis is a way of counting the cost before beginning, which Jesus commends as wisdom.

10.2 JOB AND PROCESS COSTING: CARNEGIE'S COST SHEETS

OBJECTIVES

- Distinguish direct materials, direct labor and manufacturing overhead, and compute a predetermined overhead rate.
- Compute the cost of a job using job-order costing.
- Compute equivalent units and unit costs in a simple process-costing department.

Warm-up. A cabinet shop builds custom kitchens, each different. A paint factory makes millions of identical gallons. How would each figure out what one unit costs? Write your ideas.

WATCH

Job Order Costing vs Process Costing

Edspira • 5:59

<https://www.youtube.com/watch?v=F6RzLSSKIZM>

WHEN TO WATCH

After the big idea.

BACKUP VIDEO

MA9 - Job Order Costing - Explained

Tony Bell • 11:03

<https://www.youtube.com/watch?v=z-kJwZ5cghI>

Before the job-costing worked example.

KEY TERMS

direct materials

Materials that become part of the product and can be traced to it (lumber in a cabinet, steel in a rail).

direct labor

Wages of workers who work directly on the product.

manufacturing overhead

All other factory costs that cannot be traced to a single unit: supervision, factory utilities, depreciation of machines, indirect materials.

predetermined overhead rate

Estimated annual overhead ÷ estimated annual amount of an allocation base (such as direct labor cost or machine hours), set at the start of the year to apply overhead to jobs.

job-order costing

Accumulating costs for each separate job or batch, used when products differ.

process costing and equivalent units

Averaging costs over large numbers of identical units passing through departments; partly finished units are counted as equivalent whole units.

CORE IDEAS

The story. Andrew Carnegie, who had come to America as a poor Scottish boy and risen through the Pennsylvania Railroad, opened his Edgar Thomson steel works at Braddock, Pennsylvania, in 1875 to make steel rails by the new Bessemer process. Carnegie knew from the railroad the value of exact figures. He insisted that his managers know the cost of every ton of steel, department by department, day by day. Clerks recorded the materials, fuel and labor used in each department on daily cost sheets, and Carnegie compared them, praising the departments whose costs fell and asking hard questions about those whose costs rose.

How they figured it out. Knowing costs exactly let Carnegie cut prices to win contracts and still earn a profit, replace machinery the moment a better process paid for itself, and spot waste quickly. His competitors often did not know their own costs. Accountants since have developed two main systems. **Job-order costing** follows each separate job, as in a print shop, a builder or a custom furniture maker. **Process costing** follows each department of a continuous process, as in a steel mill, a refinery or a bakery making thousands of identical loaves, and divides each department's costs by the units it produced.

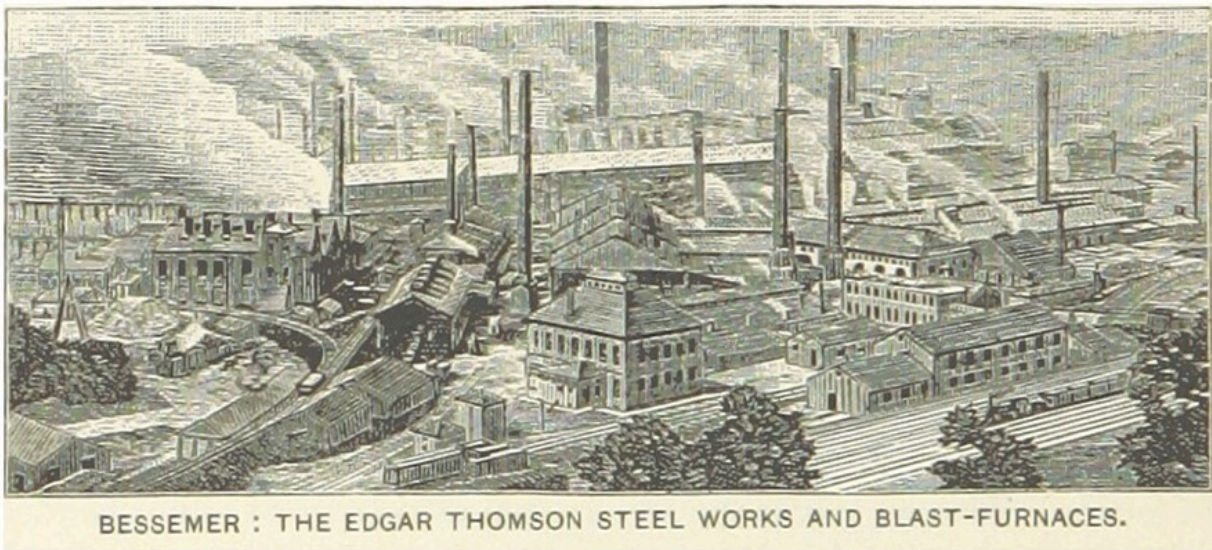
The big idea. Product cost = direct materials + direct labor + manufacturing overhead. Overhead cannot be traced to each unit, so it is **applied** with a **predetermined rate** set at the start of the year (for example, 150% of direct labor cost). **Job costing:** a job cost sheet adds the materials requisitioned, the labor hours worked and the overhead applied. **Process costing:** each department finds its

equivalent units (completed units plus the fraction-complete of units still in process), divides its costs by the equivalent units, and assigns cost to finished units and to ending work in process.

In business today. Contractors price bids from job costs; manufacturers set prices and choose products from unit costs; hospitals and law firms track the cost of each case. Modern systems add “activity-based costing,” which assigns overhead by the activities that cause it. All of them rest on Carnegie’s insight: you cannot manage what you do not measure.

Who gained? Carnegie Steel’s cost discipline gave customers cheaper steel rails and beams, builders a stronger product, and financiers and Carnegie himself great wealth, much of which he later gave away to build libraries and other institutions. Workers had steady jobs but very long hours and dangerous work, and the 1892 Homestead labor dispute at one of his mills ended in bitter conflict. Low costs are a virtue; how they are achieved still matters.

PICTURE STUDY



Bessemer: The Edgar Thomson Steel Works and Blast Furnaces, Engraving from a period publication, 1891 · Engraving · Braddock, Pennsylvania
Image: [Wikimedia Commons](#), public domain

Carnegie's Edgar Thomson works at Braddock, near Pittsburgh, was named for the president of the Pennsylvania Railroad, its first great customer. Each department of works like this one had its own daily cost sheet.

Look closely

- Find the blast furnaces and the Bessemer converter house.
- Find the railroad tracks and the river. How did materials arrive and rails leave?
- Look for stockpiles of ore, coal or limestone.
- Count the smokestacks.

Talk about it

1. Which costs of this works are direct materials, direct labor and overhead?
2. Why would process costing fit a steel mill better than job costing?
3. What would Carnegie have looked for on a department's daily cost sheet?

PROJECT

Cost a Job and a Process

You will cost one custom job and one batch process from your own kitchen or workshop, with real prices.

You will need

- A recipe or project you can make twice (with a parent): a custom item and a batch item
- Receipts or price lists
- A timer
- Spreadsheet

Steps

1. Choose a custom job (a birthday cake to order, a birdhouse to a customer's design) and a batch process (a double batch of cookies, a set of identical seed-starter pots).
2. For the job: record direct materials with real prices and your hours. Set a labor rate (what a helper would be paid) and an overhead rate (for example, 50% of labor, for oven or tool use).
3. Prepare a job cost sheet and a price at cost plus a markup.
4. For the batch: record total materials and labor and overhead for the batch, and the number of units.
5. Pretend the batch was interrupted with some units half finished; compute equivalent units and cost per unit.
6. Compare the cost per unit of the batch item with the job item.
7. Write a paragraph in Carnegie's spirit: where could you cut cost without cutting quality?

Tips

- Time your work honestly; labor is often the largest cost.
- Overhead is real even at home: electricity, wear on tools.

Check your work

- ☐ My job cost sheet totals materials, labor and overhead correctly.
- ☐ My equivalent-unit calculation is correct.
- ☐ I suggest at least one specific cost improvement.

LEDGER NOTEBOOK

1. Draw a job cost sheet with its three sections.
2. Draw a process flowing through two departments with costs passing from one to the next.
3. Write the Carnegie Steel stakeholder scorecard.

KEY FORMULAS

$$\text{Predetermined overhead rate} = \frac{\text{Estimated overhead}}{\text{Estimated allocation base}}$$

$$\text{Job cost} = \text{DM} + \text{DL} + \text{Applied overhead}$$

$$\text{Equivalent units} = \text{Units completed} + (\text{Ending WIP units} \times \% \text{ complete})$$

From history. Carnegie sold his company in 1901 to the group that formed U.S. Steel (Lesson 4.5) and spent the rest of his life giving his fortune away, funding more than 2,500 public libraries and many schools and institutions.

WORKED EXAMPLES

Example 1. A furniture shop estimates overhead of \$300,000 and direct labor cost of \$200,000 for the year. Job 101 uses \$4,200 of direct materials and 60 hours of direct labor at \$25 an hour. Compute the overhead rate and the cost of Job 101. If the shop prices jobs at cost plus 30%, what is the price?

Show solution

1. Overhead rate = $300,000 \div 200,000 = 150\%$ of direct labor cost.
2. Direct labor = $60 \times 25 = \$1,500$. Overhead applied = $1.50 \times 1,500 = \$2,250$.
3. Job cost = $4,200 + 1,500 + 2,250 = \$7,950$.
4. Price = $7,950 \times 1.30 = \$10,335$.

Answer: Job cost \$7,950; price \$10,335.

Example 2. A mixing department starts 12,000 units in a month (no beginning work in process). It completes 10,000; the other 2,000 are 50% complete as to conversion (labor and overhead). Materials are all added at the start. Costs: materials \$48,000; conversion \$66,000. Compute equivalent units, unit costs, and the cost of completed units and ending work in process.

Show solution

1. Equivalent units, materials: $10,000 + 2,000 \times 100\% = 12,000$. Conversion: $10,000 + 2,000 \times 50\% = 11,000$.
2. Cost per EU: materials $48,000 \div 12,000 = \$4.00$; conversion $66,000 \div 11,000 = \$6.00$. Total \$10.00 per finished unit.
3. Completed: $10,000 \times 10.00 = \$100,000$.
4. Ending WIP: materials $2,000 \times 4.00 = 8,000$; conversion $1,000 \times 6.00 = 6,000$; total \$14,000.
5. Check: $100,000 + 14,000 = 114,000 = 48,000 + 66,000$.

Answer: Completed units \$100,000; ending work in process \$14,000.

Example 3. A steel department's daily cost sheets show: Monday, 400 tons at a total cost of \$11,200; Tuesday, 420 tons at \$11,550. What is the cost per ton each day, and what question would Carnegie have asked?

Show solution

1. Monday: $11,200 \div 400 = \$28.00$ a ton.
2. Tuesday: $11,550 \div 420 = \$27.50$ a ton.
3. Cost per ton fell 50¢. Carnegie would ask what changed (fuel, labor, yield) and how to make it permanent, and would ask the same if any day costs rose.

Answer: \$28.00 and \$27.50 a ton.

PRACTICE

1. Easy Name the three parts of product cost.

Show answer

Direct materials, direct labor, manufacturing overhead.

2. **Easy** Which system suits a custom home builder? A soft-drink bottler?

Show answer

Job-order costing; process costing.

3. **Easy** When did Carnegie open the Edgar Thomson works, and what did it make?

Show answer

1875; steel rails by the Bessemer process.

4. **Medium** Estimated overhead \$450,000; estimated machine hours 30,000. Rate?

Show answer

\$15 per machine hour.

5. **Medium** A job uses \$2,600 of materials, 40 labor hours at \$22, and 12 machine hours (overhead \$15 per machine hour). Job cost?

Show answer

$2,600 + 880 + 180 = \$3,660$.

6. **Medium** Classify: factory supervisor's salary; wood in a chair; the wages of the worker who builds the chair; glue and nails; factory electricity.

Show answer

Overhead; direct materials; direct labor; overhead (indirect materials); overhead.

7. **Medium** 8,000 units completed; 1,000 in ending WIP 40% complete for conversion. Equivalent units for conversion?

Show answer

8,400.

8. **Hard** Using Problem 7, conversion costs are \$42,000. Cost per EU, and conversion cost in completed units and in ending WIP?

Show answer

\$5.00; completed 40,000; WIP 2,000.

9. **Hard** Actual overhead for the year was \$310,000; overhead applied to jobs was \$300,000. Was overhead under- or overapplied, and by how much? What does it mean?

Show answer

Underapplied by \$10,000; actual overhead exceeded estimates, so job costs were slightly understated.

10. **Hard** Why did knowing exact costs give Carnegie an advantage over competitors?

Show answer

He could bid low and still profit, invest in processes that cut costs, and spot waste quickly, while competitors who did not know their costs priced by guess.

11. **Challenge** A bakery's oven department completes 50,000 loaves and has 5,000 loaves 60% baked at month-end. Dough (materials, added at the start) costs \$27,500; conversion costs \$39,600. Find the cost per finished loaf and the value of ending WIP.

Show answer

Materials EU 55,000 → \$0.50; conversion EU 53,000 → about \$0.747; per loaf ≈ \$1.247. Completed ≈ 62,358; WIP = 2,500 + 3,000 × 0.747 ≈ 4,742 (total 67,100).

12. **Challenge** Write a short stakeholder scorecard for Carnegie Steel, including one honest weakness.

Show answer

Sample: customers 5 (cheaper steel); builders 5 (better product); financiers and Carnegie 5; workers 2 (long hours, danger, the Homestead conflict); community 3 (jobs and later libraries, but harsh conditions).

COMMON MISTAKES

- Treating indirect materials (glue, nails) as direct materials.
- Using actual overhead instead of the predetermined rate during the year.
- Counting partly finished units as whole units.

Make it a game • Carnegie Cost Sheet Race. Your parent gives estimated overhead and direct labor hours for the year. Compute the predetermined overhead rate. Then cost a job: materials, direct labor hours and applied overhead. Add a markup to set the price, filling out a cost sheet as Carnegie's managers did. Race a timer, then explain how process costing differs in one minute.

10.3 BUDGETS: JOSEPH'S SEVEN YEARS

OBJECTIVES

- Explain the purposes of budgeting: planning, coordination, control and evaluation.
- Prepare a sales budget, a production budget and a cash budget.
- Compare actual results with a flexible budget and explain variances.

Warm-up. Plan a family meal for twelve people with a \$90 limit. List what you would buy and the cost of each. What will you do if one item costs more than you expected?

WATCH

Introduction to Budgeting (Managerial Accounting)

Edspira • 7:05

<https://www.youtube.com/watch?v=pCwLhz0lttE>

WHEN TO WATCH

After the story and before the big idea.

BACKUP VIDEO

The Master Budget

Edspira • 11:18

<https://www.youtube.com/watch?v=Wy9MGfjS7ZA>

Before Worked Example 2, to see how the parts of a master budget connect.

KEY TERMS

budget

A plan for the future expressed in numbers: expected sales, production, costs and cash for a period.

master budget

The full set of budgets for a period: sales, production, materials, labor, overhead, operating expenses, cash, and budgeted statements.

cash budget

A month-by-month plan of cash receipts, payments, borrowing and repayment, showing whether the business will have enough cash.

flexible budget

A budget adjusted to the actual level of activity, so costs can be fairly compared with what they should have been at that volume.

variance

The difference between actual and budgeted amounts; favorable if it increases profit, unfavorable if it decreases it.

CORE IDEAS

The story. When Pharaoh dreamed of seven fat cattle and seven lean, Joseph told him that seven years of plenty would be followed by seven years of famine, and proposed a plan: appoint officers to “take up the fifth part of the land of Egypt in the seven plenteous years,” and “let them gather all the food of those good years... and that food shall be for store to the land against the seven years of famine” (Genesis 41:34-36). Joseph’s plan had a quantity (a fifth of the harvest), a time (seven years), a place (storehouses in the cities), and a purpose (to carry the people through the famine). It was, in every sense, a budget.

How they figured it out. Businesses have always planned, but formal budgeting spread in the early 1900s as companies grew too large for owners to watch everything themselves. Companies such as DuPont and General Motors, under Donaldson Brown and Alfred Sloan, built yearly budgets that began with a sales forecast and worked through production, purchasing, labor and cash, and then compared actual results with the plan every month. James O. McKinsey’s textbook *Budgetary Control* (1922) taught the method across American business.

The big idea. The **sales budget** comes first: expected units $\times$ price. The **production budget** follows: units to produce = sales + desired ending inventory – beginning inventory. Materials, labor and overhead budgets follow from production. The **cash budget** combines expected collections and payments to show the cash balance each month and any need to borrow. During the year, managers compare actual results with a **flexible budget** (the budget recalculated for the actual volume), so that a department is not blamed for higher costs that came from making more units.

In business today. Every well-run business, church, school and family keeps a budget. Banks require cash budgets from borrowers. A budget is not a cage but a plan: it helps people agree on priorities, see trouble coming, and measure whether they did what they intended. The cash budget especially has saved many profitable businesses from running out of cash (Lesson 4.4).

Think it through. “The thoughts of the diligent tend only to plenteousness; but of every one that is hasty only to want” (Proverbs 21:5). Joseph’s diligence in the years of plenty fed a nation in the years of want.

PICTURE STUDY



Joseph, Overseer of Pharaoh's Granaries, Lawrence Alma-Tadema, 1874 · Oil on panel · Dahesh Museum of Art, New York

Image: [Wikimedia Commons](#), public domain

Alma-Tadema, who studied ancient Egypt closely, painted Joseph as Pharaoh's overseer receiving a scribe's report on the granaries. The scene is the bookkeeping behind the biblical story.

Look closely

- Find Joseph and the scribe. Who is reporting to whom?
- Find the writing tablet or papyrus. What might be recorded on it?
- Look at the painted walls and columns. What do they tell you about Joseph's position?
- Look for any signs of grain or storehouses.

Talk about it

1. What records would Joseph need to carry out his plan over fourteen years?
2. Why would a good plan fail without honest record-keeping by the scribes?
3. How is a modern budget like Joseph's plan, and how is it different?

PROJECT

A Real Budget

You will prepare a real budget, with a parent, for a family project, a youth group, a ministry event or your own coming year, and compare it with actual results.

You will need

- Spreadsheet
- Real prices and a parent or leader to work with

Steps

1. Choose a budget: a family vacation, a youth group retreat, a garden season, a church event, or your own income and spending for three months.
2. Forecast the income (or funds available) with reasons.
3. List every expected cost with real prices; separate fixed and variable costs where it fits.
4. Prepare a month-by-month cash budget showing when money comes in and goes out, with a minimum balance.
5. Include giving and saving as planned lines, not leftovers.
6. During the period (or with past records), record actual amounts beside the budget.
7. Compute variances and explain the three largest.
8. Write a short report: what you learned, what you would change, and how Joseph's plan and Proverbs 21:5 apply.

Tips

- Budget for the unexpected with a small contingency line.
- Keep private family figures at home.

Check your work

- ☐ My budget uses real prices and covers every month.
- ☐ My cash budget never falls below the minimum without a plan.

- ☐ I explained the largest variances honestly.

LEDGER NOTEBOOK

1. Draw the master budget as a flow chart from the sales budget to the cash budget and budgeted statements.
2. Copy February's cash budget.
3. Write Genesis 41:35-36 or Proverbs 21:5.

KEY FORMULAS

Units to produce = Budgeted sales + Desired ending inventory – Beginning inventory

Ending cash = Beginning cash + Receipts – Payments(+Borrowing – Repayment)

From history. James O. McKinsey, who wrote *Budgetary Control* in 1922, was a professor of accounting at the University of Chicago and founded the consulting firm that still bears his name.

WORKED EXAMPLES

Example 1. A company expects to sell 1,000, 1,400, 1,800 and 1,200 units in quarters 1–4, and 1,100 units in the first quarter of next year, at \$50 each. It wants ending inventory equal to 20% of the next quarter's sales; it has 200 units at the start of the year. Prepare the sales and production budgets.

Show solution

1. Sales budget: $1,000 \times 50 = 50,000$; $1,400 \times 50 = 70,000$; $1,800 \times 50 = 90,000$; $1,200 \times 50 = 60,000$. Year: 5,400 units, \$270,000.
2. Desired ending inventory: Q1 $0.2 \times 1,400 = 280$; Q2 360; Q3 240; Q4 $0.2 \times 1,100 = 220$.
3. Production: Q1 $1,000 + 280 - 200 = 1,080$; Q2 $1,400 + 360 - 280 = 1,480$; Q3 $1,800 + 240 - 360 = 1,680$; Q4 $1,200 + 220 - 240 = 1,180$.
4. Year: 5,420 units = 5,400 sales + 220 ending – 200 beginning.

Answer: Production: 1,080; 1,480; 1,680; 1,180 (5,420 for the year).

Example 2. Prepare February's cash budget. Beginning cash \$8,000. Sales: January \$40,000, February \$50,000; 60% of sales are collected in the month of sale and 40% the next month. February payments: purchases \$28,000; wages \$12,000; rent \$3,000; equipment \$6,000. The company wants a minimum cash balance of \$6,000 and can borrow in \$1,000 amounts.

Show solution

1. Collections: $60\% \times 50,000 = 30,000$ (February sales) + $40\% \times 40,000 = 16,000$ (January sales) = \$46,000.
2. Payments: $28,000 + 12,000 + 3,000 + 6,000 = \$49,000$.
3. Cash before borrowing: $8,000 + 46,000 - 49,000 = \$5,000$.
4. Borrow \$1,000 to reach the \$6,000 minimum. Ending cash \$6,000.

Answer: Collections \$46,000; payments \$49,000; borrow \$1,000; ending cash \$6,000.

Example 3. A department budgeted 10,000 units with costs of \$4 a unit variable plus \$20,000 fixed (\$60,000). It actually made 11,000 units at a cost of \$66,500. Compare actual cost with the static and flexible budgets.

Show solution

1. Static budget comparison: $66,500 - 60,000 = \$6,500$ unfavorable, but it ignores the extra 1,000 units.
2. Flexible budget for 11,000 units: $4 \times 11,000 + 20,000 = \$64,000$.
3. Flexible-budget variance: $66,500 - 64,000 = \$2,500$ unfavorable: the true overspending.

Answer: Flexible budget \$64,000; true variance \$2,500 unfavorable.

PRACTICE

1. Easy What budget is prepared first, and why?

Show answer

The sales budget, because production, purchases, labor and cash all depend on expected sales.

2. Easy What was Joseph's plan, in budget terms?

Show answer

Collect a fifth of the harvest in the seven years of plenty and store it in the cities as a reserve for the seven years of famine.

3. Easy What is a favorable variance?

Show answer

A difference between actual and budget that increases profit (higher revenue or lower cost).

4. Medium Sales 2,000 units; desired ending inventory 300; beginning inventory 250. Units to produce?

Show answer

2,050.

5. Medium Collections: 70% in month of sale, 30% next month. Sales: March \$60,000, April \$80,000. April collections?

Show answer

$56,000 + 18,000 = \$74,000$.

6. Medium Beginning cash \$5,000; receipts \$74,000; payments \$81,000; minimum balance \$4,000. How much must be borrowed?

Show answer

Before borrowing -2,000; borrow \$6,000.

7. Medium Why should a manager be judged against a flexible budget rather than the original budget?

Show answer

Costs naturally rise with volume; a flexible budget shows what costs should have been at the actual volume.

8. Hard Budget: variable cost \$7 a unit, fixed \$15,000. Actual: 4,500 units, cost \$47,800. Flexible budget and variance?

Show answer

Flexible 46,500; variance \$1,300 unfavorable.

9. **Hard** Production needs 3 lb of material per unit for 1,480 units. Desired ending materials 900 lb; beginning 700 lb; price \$2 a lb. Materials purchases budget?

Show answer

Needed $4,440 + 900 - 700 = 4,640$ lb; cost \$9,280.

10. **Hard** Apply Proverbs 21:5 to a family that budgets compared with one that spends as money comes in.

Show answer

Diligent planning tends toward plenty: the budgeting family saves, prepares for needs and avoids debt; haste and impulse lead to want.

11. **Challenge** A company's cash budget shows a shortfall of \$15,000 in May, recovered by August. List three responses besides borrowing, and say which you would choose for a business that sells on credit.

Show answer

Collect receivables faster (discounts for early payment), delay a capital purchase, reduce inventory purchases, ask suppliers for longer terms, or have owners add capital. For a credit seller, speeding collections is often best.

COMMON MISTAKES

- Starting with costs instead of sales.
- Treating all sales as collected in the month of sale.
- Judging performance against a static budget when volume changed.

Make it a game • Pharaoh's Cash Budget Drill. Write a four-month cash budget for a pretend business: sales, collections, payments and ending cash. Your parent then plays Joseph's warning, announcing a change, such as a poor harvest cutting sales by 20 percent or a late-paying customer. Recalculate within ninety seconds and say when you must borrow. Explain planning, coordination, control and evaluation.

Scripture. “The thoughts of the diligent tend only to plenteousness; but of every one that is hasty only to want.” (Proverbs 21:5, KJV)

A budget is diligence written down. Joseph's careful plan in the years of plenty provided for the years of want.

10.4 CAPITAL DECISIONS AND PRESENT VALUE: FRANKLIN'S 200-YEAR GIFT

OBJECTIVES

- Compute future value and present value of single amounts and annuities.
- Evaluate an investment in equipment using payback period and net present value.
- Explain the time value of money using Benjamin Franklin's bequest to Boston and Philadelphia.

Warm-up. Would you rather have \$1,000 today or \$1,000 in five years? What about \$1,000 today or \$1,300 in five years? Write your reasoning.

WATCH

Net Present Value (NPV)

Edspira • 9:25

<https://www.youtube.com/watch?v=HFFkFMfotT0>

WHEN TO WATCH

After the big idea and before Worked Example 3.

BACKUP VIDEO

Introduction to present value | Interest and debt | Finance & Capital Markets | Khan Academy

Khan Academy • 10:19

<https://www.youtube.com/watch?v=ks33lMoxst0>

Before the worked examples, as an introduction to present value.

KEY TERMS

time value of money

A dollar today is worth more than a dollar in the future, because today's dollar can be invested to earn interest.

future value

What an amount invested today will grow to at a given interest rate: $FV = PV(1 + r)^n$.

present value

What a future amount is worth today at a given interest (discount) rate: $PV = FV / (1 + r)^n$.

annuity

A series of equal payments at regular intervals.

net present value (NPV)

The present value of an investment's future cash inflows minus its cost. A positive NPV means it earns more than the required rate.

payback period

How long it takes for an investment's cash inflows to repay its cost.

CORE IDEAS

The story. When Benjamin Franklin died in 1790, his will left £1,000 each to the cities of Boston, where he was born, and Philadelphia, where he made his life. The money was to be lent at 5% interest to young married craftsmen who had finished their apprenticeships, to help them set up in business, as others had once helped him. Franklin calculated that at 5% the £1,000 would grow in a hundred years to about £131,000. Then part would be spent on public works and the rest lent again for another hundred years. The funds did not grow quite as fast as he hoped, but they lasted the full two hundred years; in the 1990s the cities used them for a trade school in Boston and scholarships in Philadelphia.

How they figured it out. Franklin understood **compound interest**: interest earned on interest. The same arithmetic runs the other way. If money can earn a return, then money promised in the future is worth less today, and a business deciding whether to spend \$50,000 today on a machine that will save \$14,000 a year must compare the savings with the cost in today's dollars. That comparison is **present value**.

The big idea. Future value: $FV = PV(1 + r)^n$. Present value: $PV = \frac{FV}{(1 + r)^n}$. An annuity of C a year for n years has present value $C \cdot \frac{1 - (1 + r)^{-n}}{r}$. **Net present value** = present value of the inflows – the cost. Accept a project if NPV is positive at the business's required rate of return. The **payback period** (cost ÷ annual cash inflow) is simpler and shows risk, but ignores both the time value of money and inflows after payback.

In business today. Companies use NPV to choose among machines, stores, vehicles and buildings; governments use it for bridges and roads; families use the same arithmetic for mortgages and retirement savings. The required rate reflects the cost of borrowing and the risk of the project. A spreadsheet's PV, FV and NPV functions do the computing; the judgment lies in honest estimates of the future cash flows.

Think it through. In the parable of the talents, the master tells the servant who hid his money, "Thou oughtest therefore to have put my money to the exchangers, and then at my coming I should have received mine own with usury" (Matthew 25:27). Money entrusted to a steward should be put to work. Franklin's gift, still at work two centuries later, is a picture of patient stewardship.

PICTURE STUDY



The Parable of the Talents, Willem de Poorter, 17th century · Oil on panel · Location as recorded on Wikimedia Commons

Image: [Wikimedia Commons](#), public domain

Willem de Poorter, a Dutch painter influenced by Rembrandt, painted the reckoning in Jesus' parable: the master returns and his servants give account of the money he left with them.

Look closely

- Find the master and the servants. Who is giving account?
- Find the coins, purses or account books.
- Look at the light. Where does it fall?
- Look at the servants' faces and postures.

Talk about it

1. Which servant put the money to work, and how does that relate to future value?
2. Why does the master expect a return even from the cautious servant?
3. How is a business deciding on an investment like a servant deciding what to do with a talent?

PROJECT

Should We Buy the Machine?

You will evaluate a real investment decision for a family, farm, church or small business with payback and NPV, and write a recommendation.

You will need

- Spreadsheet
- Real or realistic estimates from a parent or local business owner

Steps

1. Choose a decision: replacing a family car with a more efficient one, buying a riding mower for a lawn business, adding solar water heating to a church, buying a commercial mixer for a bakery.
2. Estimate the cost and the yearly savings or extra income for each year of its life, and any salvage value. Write down the source of each estimate.
3. Choose a required rate (for example, the interest rate on a loan or savings account, plus a little for risk).
4. Compute the payback period.
5. Compute the NPV by hand for the first two years and with the spreadsheet's NPV function for all years.
6. Test the decision: what if the savings are 20% lower? What if the rate is 3 points higher?
7. Write a one-page recommendation: buy or not, with the numbers, the risks and any reasons that are not financial.

Tips

- In most spreadsheets, NPV(rate, values) assumes the first value comes one year from now; add the cost separately.
- Honest estimates matter more than precise formulas.

Check your work

- ☐ My cash flows and rate are clearly stated with sources.
- ☐ My payback and NPV are computed correctly.

- My recommendation considers risks and non-financial reasons.

LEDGER NOTEBOOK

1. Draw a timeline of an investment's cash flows with arrows discounting each back to today.
2. Copy the NPV example.
3. Write Franklin's £1,000 calculation.

KEY FORMULAS

$$FV = PV(1 + r)^n, \quad PV = \frac{FV}{(1 + r)^n}$$

$$PV_{\text{annuity}} = C \cdot \frac{1 - (1 + r)^{-n}}{r}$$

$$NPV = \sum \frac{C_t}{(1 + r)^t} - \text{Cost}$$

From history. Boston's fund was used after its first century partly to build the Franklin Union, a trade school that became today's Benjamin Franklin Cummings Institute of Technology; the final distributions in both cities were made in the early 1990s.

WORKED EXAMPLES

Example 1. Franklin's calculation: what does £1,000 grow to in 100 years at 5% compounded annually?

Show solution

1. $FV = 1,000 \times 1.05^{100} \approx 1,000 \times 131.50 = 131,501.$
2. Franklin's own estimate in his will was about £131,000, matching the formula.

Answer: About £131,500.

Example 2. What is the present value of \$10,000 to be received in 6 years at 7%?

Show solution

$$1. PV = \frac{10,000}{1.07^6} = \frac{10,000}{1.5007} \approx 6,663.$$

Answer: About \$6,663.

Example 3. A machine costs \$50,000 and will save \$14,000 a year for 5 years, with no salvage value. The company requires an 8% return. Compute the payback period and the NPV, and decide.

Show solution

1. Payback = $50,000 \div 14,000 \approx 3.57$ years.
2. Annuity factor at 8% for 5 years = $\frac{1 - 1.08^{-5}}{0.08} \approx 3.9927$.
3. PV of savings = $14,000 \times 3.9927 \approx \$55,898$.
4. NPV = $55,898 - 50,000 = \$5,898$.

Answer: Payback about 3.6 years; NPV about \$5,898 (positive), so the machine earns more than 8%: accept.

PRACTICE

1. Easy What did Franklin's will do with £1,000 for Boston and for Philadelphia?

Show answer

Lend it at 5% to young married craftsmen for 100 years, then use part for public works and lend the rest for another 100 years.

2. Easy FV of \$2,000 at 6% for 10 years?

Show answer

$$2,000 \times 1.7908 \approx \$3,582.$$

3. Easy PV of \$5,000 in 4 years at 5%?

Show answer

$$5,000 \div 1.2155 \approx \$4,114.$$

4. Medium PV of \$3,000 a year for 6 years at 7%?

Show answer

$$\text{Factor} \approx 4.7665; \approx \$14,300.$$

5. Medium A \$24,000 truck saves \$6,000 a year. Payback?

Show answer

4 years.

6. **Medium** Why does payback ignore part of a project's value?

Show answer

It ignores the timing of cash within the payback period (time value) and any cash after payback.

7. **Medium** A project costs \$30,000 and returns \$9,000 a year for 4 years at a 10% required rate. NPV?

Show answer

Factor 3.1699; PV 28,529; NPV $\approx$ -\$1,471: reject.

8. **Hard** Same project, but it also has a \$5,000 salvage value at the end of year 4. NPV?

Show answer

Add $5,000 \div 1.4641 \approx 3,415$; NPV $\approx$ +\$1,944: accept.

9. **Hard** Two machines: A costs \$40,000 and saves \$12,000 a year for 5 years; B costs \$25,000 and saves \$8,000 a year for 4 years. Required rate 9%. Which has the higher NPV?

Show answer

A: $12,000 \times 3.8897 = 46,676 - 40,000 = 6,676$. B: $8,000 \times 3.2397 = 25,918 - 25,000 = 918$. A is higher.

10. **Hard** How does Matthew 25:27 relate to the time value of money?

Show answer

The master expected even the cautious servant to put money with the exchangers to earn interest; money has a time value and should be put to productive use.

11. **Challenge** If Franklin's fund had earned 4% instead of 5% for 100 years, what would £1,000 have grown to? What does this show?

Show answer

$1,000 \times 1.04^{100} \approx \text{£}50,505$, less than half of £131,501. Small differences in rate make huge differences over long periods.

COMMON MISTAKES

- Adding future dollars without discounting them.

- Using the spreadsheet NPV function and forgetting to subtract the cost at time zero.
- Choosing only by payback when NPV disagrees.

Make it a game · Buy the Machine Showdown. A machine costs 5,000 and saves 1,500 a year for five years. Your parent asks for the payback period right away. Then discount each year's savings at 8 percent and compute the net present value. Decide whether to buy and defend the decision. Estimate Franklin's 200-year gift growing at a stated rate to practice future value.

Scripture. “Thou oughtest therefore to have put my money to the exchangers, and then at my coming I should have received mine own with usury.” (Matthew 25:27, KJV)

The master expected his money to be put to work. Present value is the arithmetic of that expectation: money has a time value, and stewards should use it well.

10.5 CAPSTONE: MILTON HERSHEY AND A SMALL BUSINESS'S BOOKS

OBJECTIVES

- Complete a full accounting cycle and all four financial statements for a small business's first month.
- Analyze the business with ratios, break-even and a cash plan.
- Write a stakeholder report and a plan for the business's next quarter, in the spirit of Milton Hershey.

Warm-up. List every skill you have learned in this course, from the accounting equation to present value. Circle the three you think a small-business owner needs most.

WATCH

The KEY to Understanding Financial Statements

Accounting Stuff • 6:28

https://www.youtube.com/watch?v=_F6a0ddbgtI

WHEN TO WATCH

Before you begin the capstone, as a review of how the statements fit together.

KEY TERMS

capstone

A final project that brings together everything learned in a course.

business plan

A written plan describing a business, its market, its operations and its financial projections.

stakeholder report

A report on how a business serves its financiers, owners, builders, workers, customers and community.

CORE IDEAS

The story. Milton Hershey (1857–1945) learned candy making as an apprentice in Lancaster, Pennsylvania. His first candy business in Philadelphia, begun in 1876, failed after six years, and later attempts in Chicago and New York failed too. He came

home to Lancaster almost penniless and in 1886 founded the Lancaster Caramel Company, whose caramels made with fresh milk sold across the country and abroad. In 1900 he sold it for \$1 million and put his fortune into milk chocolate. He built a factory in the farmland of Derry Township, opened in 1905, and a town around it for his workers, with homes, schools, parks and churches. In 1909 he and his wife Catherine founded the Hershey Industrial School for orphan boys, and in 1918 he gave most of his fortune to the trust that supports it, today the Milton Hershey School.

How they figured it out. Hershey's early failures taught him lessons that show in his later success: watch costs closely, buy materials well (he secured a steady supply of fresh milk from local dairy farms), produce in volume to lower costs, and keep enough cash. His success then let him serve every stakeholder: customers got an affordable chocolate bar, workers got steady jobs and a good town, and the community received schools and, through the school trust, a lasting gift to thousands of children.

The big idea. This capstone uses everything in the course. You will record a month of transactions for a small candy business, post them, prepare a trial balance, adjust, prepare all four financial statements, close the books, and then analyze the results with ratios, a break-even point and a cash plan for the next quarter, ending with a stakeholder report. Each part checks the others: the trial balance must balance, the statements must articulate, and the change in cash must match the cash-flow statement.

In business today. Every year thousands of small businesses begin with an owner, an idea, a little capital and a set of books. The ones that last usually know their numbers: what each product costs, how much cash will be on hand next month, and whether they are serving their customers well. Accounting will not make a business honest or wise, but an honest and wise owner cannot do without it.

Think it through. Hershey failed before he succeeded, and he gave away most of what he gained. The books recorded both. A steward's accounts tell not only how much was earned but what was done with it.

PICTURE STUDY



The Lancaster Caramel Company and Hershey Chocolate Company Factory, Unknown photographer, about 1896 · Photograph · Lancaster, Pennsylvania

Image: [Wikimedia Commons](#), public domain

This was the Lancaster factory of Hershey's caramel company, where he also began making chocolate in the 1890s. He sold the caramel business in 1900 and built his great chocolate factory and town in Derry Township.

Look closely

- Find the loaded wagons. What might they carry in or out?
- Count the floors and windows. How many workers might it hold?
- Find the fire escapes. Why would a large factory need them?
- Look for any people in the street.

Talk about it

1. After years of failure, what do you think Hershey did differently in this business?
2. What records would he need to know which candies were profitable?
3. How did the profits of this factory become, in the end, a gift to thousands of children?

PROJECT

Capstone Practice Set: A Quarter in the Life of a Small Business

You will keep the complete books of Weaver Fudge Company (or a business of your own design, with a parent's approval) for November and December, building on October, and present a final report.

You will need

- Your October books from the worked examples
- Journal, ledger and worksheet paper, or a spreadsheet; optionally GnuCash
- Calculator

Steps

1. Open the November ledger with the October 31 post-closing balances.
2. Write at least 15 realistic transactions for each of November and December (a holiday season), including credit sales, a supplier on account, wages, a note payment with interest, a purchase of a second piece of equipment and an owner's withdrawal. Keep a source document or note for each.
3. Journalize, post and prepare a trial balance for each month.
4. Make at least five adjusting entries each month and prepare a worksheet in a spreadsheet with check cells.
5. Prepare all four financial statements for each month and for the quarter (October–December).
6. Close the books at December 31 and prepare a post-closing trial balance.
7. Analyze: current ratio, net margin, ROA, break-even sales, and a cash budget for January–March.
8. Evaluate one capital decision (a new machine or a delivery bicycle) with NPV.
9. Write a stakeholder report and a one-page plan for the next quarter, and present your books to a parent as if to a banker.

Tips

- Check your work at every step: entries balance, the trial balance balances, the statements articulate, the cash-flow statement proves the change in cash.
- Holiday seasons raise sales and inventory; plan cash for the January slump.

Check your work

- ☐ Every month's trial balance, adjusted trial balance and post-closing trial balance balance.
- ☐ My quarterly statements articulate and the cash-flow statement proves the change in cash.
- ☐ My analysis, cash budget, NPV and stakeholder report use my own numbers and are clearly explained.

LEDGER NOTEBOOK

1. Draw a one-page map of the whole course: the accounting cycle in the center, the four statements around it, and analysis, auditing and managerial accounting on the outside.
2. Copy Weaver Fudge's October balance sheet.
3. Write the Hershey stakeholder scorecard.

From history. Milton Hershey kept building during the Great Depression of the 1930s, putting local people to work constructing a hotel, a community building and a new school, rather than laying workers off. He said he did not want his people to be without work.

WORKED EXAMPLES

Example 1. Weaver Fudge Company, owned by Anna Weaver, opens October 1. Journalize its October transactions and prepare the unadjusted trial balance: (1) Anna invests \$15,000. (2) Buys kitchen equipment for \$9,000: \$3,000 cash and a \$6,000, 6% note. (3) Pays \$2,700 for three months' rent in advance. (4) Buys ingredients and boxes (supplies) on account, \$2,400. (5) Cash sales, \$6,200. (6) Sales on account to a grocery, \$1,800. (7) Pays wages, \$1,600. (8) Pays the supplier \$2,400. (9) Collects \$1,000 from the grocery. (10) Pays utilities, \$340. (11) Pays advertising, \$250. (12) Anna withdraws \$1,200.

Show solution

1. (1) Debit Cash \$15,000; credit Anna Weaver, Capital \$15,000. (2) Debit Equipment \$9,000; credit Cash \$3,000; credit Notes Payable \$6,000. (3) Debit Prepaid Rent \$2,700; credit Cash \$2,700.
2. (4) Debit Supplies \$2,400; credit Accounts Payable \$2,400. (5) Debit Cash \$6,200; credit Sales \$6,200. (6) Debit Accounts Receivable \$1,800; credit Sales \$1,800.
3. (7) Debit Wages Expense \$1,600; credit Cash \$1,600. (8) Debit Accounts Payable \$2,400; credit Cash \$2,400. (9) Debit Cash \$1,000; credit Accounts Receivable \$1,000.
4. (10) Debit Utilities Expense \$340; credit Cash \$340. (11) Debit Advertising Expense \$250; credit Cash \$250. (12) Debit Anna Weaver, Drawing \$1,200; credit Cash \$1,200.
5. Cash: $15,000 - 3,000 - 2,700 + 6,200 - 1,600 - 2,400 + 1,000 - 340 - 250 - 1,200 = \$10,710$.
6. Unadjusted trial balance: debits Cash 10,710; A/R 800; Supplies 2,400; Prepaid Rent 2,700; Equipment 9,000; Drawing 1,200; Wages 1,600; Utilities 340; Advertising 250 = \$29,000. Credits: Notes Payable 6,000; Capital 15,000; Sales 8,000 = \$29,000.

Answer: Unadjusted trial balance $\$29,000 = \$29,000$.

Example 2. Adjust Weaver Fudge at October 31 (supplies on hand \$700; one month of rent; depreciation \$150; wages owed \$300; one month of interest on the note) and prepare the income statement, statement of owner's equity and balance sheet.

Show solution

1. Adjustments: Supplies Expense 1,700; Rent Expense 900; Depreciation Expense 150; Wages Expense 300 (Wages Payable); Interest Expense 30 ($6,000 \times 6\% \times 1/12$). Adjusted trial balance totals \$29,480.
2. Income statement: Sales 8,000. Expenses: Wages 1,900; Supplies 1,700; Rent 900; Utilities 340; Advertising 250; Depreciation 150; Interest 30 = 5,270. Net income \$2,730.
3. Owner's equity: $0 + \text{investment } 15,000 + \text{net income } 2,730 - \text{drawing } 1,200 = \$16,530$.
4. Balance sheet: Cash 10,710; A/R 800; Supplies 700; Prepaid Rent 1,800 (current assets 14,010); Equipment $9,000 - 150 = 8,850$; total assets \$22,860. Liabilities: Wages Payable 300; Interest Payable 30; Notes Payable 6,000 = \$6,330. Capital \$16,530. Total \$22,860.

Answer: Net income \$2,730; capital \$16,530; total assets \$22,860 = liabilities \$6,330 + equity \$16,530.

Example 3. Prepare Weaver Fudge's October statement of cash flows and compute its break-even sales. Treat wages, rent, utilities, advertising, depreciation and interest as fixed (\$3,570 a month) and supplies as variable (21.25% of sales).

Show solution

1. Operating: net income 2,730 + depreciation 150 – increase in A/R 800 – increase in supplies 700 – increase in prepaid rent 1,800 + increase in wages payable 300 + increase in interest payable 30 = –\$90.
2. Investing: equipment purchased for cash –\$3,000 (the \$6,000 note is a noncash financing of the rest, disclosed separately).
3. Financing: owner investment +15,000; withdrawal –1,200 = +\$13,800.
4. Net change: –90 – 3,000 + 13,800 = \$10,710, equal to ending cash (beginning cash was zero).
5. Contribution margin ratio = $1 - 0.2125 = 78.75\%$. Break-even sales = $3,570 \div 0.7875 \approx \$4,533$ a month. October sales of \$8,000 give a margin of safety of about 43%.

Answer: Operating cash flow –\$90; net change in cash \$10,710; break-even sales about \$4,533 a month.

PRACTICE

1. Easy When did Milton Hershey found the Lancaster Caramel Company, and what did he do with it in 1900?

Show answer

1886; he sold it for \$1 million and turned to milk chocolate.

2. Easy What school did the Hersheys found in 1909?

Show answer

The Hershey Industrial School for orphan boys, now the Milton Hershey School.

3. **Easy** Prepare Weaver Fudge's closing entries (summary).

Show answer

Dr Sales 8,000, Cr Income Summary 8,000; Dr Income Summary 5,270, Cr the seven expenses; Dr Income Summary 2,730, Cr Capital 2,730; Dr Capital 1,200, Cr Drawing 1,200.

4. **Medium** Prepare Weaver Fudge's post-closing trial balance totals.

Show answer

Debits: $10,710 + 800 + 700 + 1,800 + 9,000 = 23,010$. Credits: $150 + 300 + 30 + 6,000 + 16,530 = 23,010$.

5. **Medium** Compute Weaver Fudge's current ratio and net margin for October.

Show answer

Current assets $14,010 \div$ current liabilities 330 (wages and interest payable; assume the note is long-term) ≈ 42.5 ; net margin $2,730 \div 8,000 \approx 34.1\%$.

6. **Medium** Why was operating cash flow negative even though net income was \$2,730?

Show answer

Cash was tied up in receivables, unused supplies and two months of prepaid rent.

7. **Medium** If fudge sells for \$20 a pound and ingredients cost \$4.25 a pound, how many pounds a month must Weaver Fudge sell to break even?

Show answer

CM 15.75; $3,570 \div 15.75 \approx 226.7$, so 227 pounds.

8. **Hard** Anna wants to earn \$4,000 a month before drawing. How many pounds must she sell?

Show answer

$(3,570 + 4,000) \div 15.75 \approx 480.6$, so 481 pounds (about \$9,620 of sales).

9. **Hard** A new candy-pulling machine costs \$4,800 and will save \$150 a month in wages for 3 years (36 months). At 1% a month, is it worth buying? (Annuity factor for 36 months at 1% ≈ 30.1075 .)

Show answer

PV $\approx 4,516$; NPV ≈ -284 ; not worth it at these figures.

10. **Hard** Write a stakeholder scorecard for Hershey's chocolate company in his lifetime, with one reason for each group.

Show answer

Sample: customers 5 (an affordable, good chocolate bar); workers 4 (steady jobs and a planned town, though company towns limit independence); community 5 (schools, parks, the school trust); financiers 4; risk-taker Hershey 5; builders 5 (dairy supply and efficient production).

11. **Challenge** Weaver Fudge plans November sales of \$9,000 (70% cash, 30% collected in December), collects the remaining \$800 from October, and expects payments of \$7,100 (including \$300 of October wages and a \$1,200 withdrawal). Starting from \$10,710, what is the November ending cash?

Show answer

Receipts $6,300 + 800 = 7,100$; ending cash $10,710 + 7,100 - 7,100 = \$10,710$.

COMMON MISTAKES

- Skipping the checks between steps; one early error spreads through every statement.
- Forgetting noncash investing and financing (the note for equipment) in the cash-flow statement notes.
- Treating the owner's withdrawals as an expense when computing break-even or net income.

Make it a game • Hershey Oral Exam Challenge. Your parent draws cards covering the whole course: the cycle, the four statements, ratios, break-even and a cash plan. For each card, give a 45-second explanation without notes, with one worked number. Include one card on Milton Hershey's business and how honest books kept his enterprise steady. Score points for accuracy and aim to improve your total.

UNIT 10

MANAGERIAL ACCOUNTING

Financial accounting reports to outsiders what has happened. Managerial accounting helps the people inside a business decide what to do next. This unit begins with counting the cost (Luke 14:28) and Henry Ford's use of volume and cost behavior to cut the Model T's price from \$850 to about \$260, then follows Andrew Carnegie's daily cost sheets into job and process costing.

You will build budgets on the pattern of Joseph's seven years of plenty, evaluate investments with present value as Benjamin Franklin did when he left £1,000 to Boston and Philadelphia to be lent for two hundred years, and finish the course with a capstone: a complete set of books and an analysis for a small candy business, in the spirit of Milton Hershey, who failed several times, learned from his records, and gave his fortune to a school for orphans. A final exam on the whole course follows this unit.

PREREQUISITES

- The full accounting cycle and statements (Units 3–4)
- Ratios (Unit 9)
- Exponents and spreadsheet formulas

MASTERY CHECKLIST

- ☐ I can classify costs, separate mixed costs and compute break-even, target-profit volume and margin of safety.
- ☐ I can cost a job with a predetermined overhead rate and cost a process with equivalent units.
- ☐ I can prepare sales, production and cash budgets and compare actual results with a flexible budget.
- ☐ I can compute present and future values and evaluate an investment with payback and NPV.
- ☐ I can keep a complete set of books for a small business and analyze them for its stakeholders.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Principles of Accounting, Volume 2: Managerial Accounting (OpenStax, Rice University)**: Free. Cost behavior, job and process costing, budgeting and capital budgeting, with practice problems. Ages 15 and up.
- **GnuCash**: Free. Optional for the capstone practice set: keep Weaver Fudge's books in GnuCash alongside your hand-prepared books and compare the reports.
- **The Way to Wealth, by Benjamin Franklin (1758)**: Free on Project Gutenberg. Franklin's sayings on thrift and industry; a fitting companion to Lesson 10.4 and his long-term gift to Boston and Philadelphia.

Not required. Every project in this unit works without them. School Launch has no ties to these authors, publishers or companies.

LESSONS IN THIS UNIT

10.1 Cost Behavior and Break-Even: Counting the Cost	3 sessions of 50 minutes
10.2 Job and Process Costing: Carnegie's Cost Sheets	3 sessions of 50 minutes
10.3 Budgets: Joseph's Seven Years	3 sessions of 50 minutes
10.4 Capital Decisions and Present Value: Franklin's 200-Year Gift	3 sessions of 50 minutes
10.5 Capstone: Milton Hershey and a Small Business's Books	3 sessions of 50 minutes

UNIT 10 TEST

Calculators are allowed. Show your work, including each formula. Answer concept questions and the essay in complete sentences. The test is worth 100 points.

1. **4 pts**

Classify as fixed, variable or mixed: factory rent; raw materials; a phone bill with a base fee plus usage; sales commissions.

2. **8 pts**
Price \$60; variable cost \$36; fixed costs \$48,000. Compute CM per unit, CM ratio, break-even units and sales.
3. **5 pts**
Using Problem 2, units to earn \$24,000 profit, and the margin of safety if 2,500 units are planned.
4. **5 pts**
Maintenance cost \$5,200 at 1,000 hours and \$8,200 at 2,500 hours. High-low variable rate and fixed portion?
5. **6 pts**
Estimated overhead \$360,000; estimated direct labor hours 24,000. A job uses \$3,400 materials and 50 labor hours at \$24. Overhead rate and job cost?
6. **8 pts**
A department completes 9,000 units; 3,000 in ending WIP are 40% complete for conversion; materials added at start. Materials cost \$36,000; conversion \$51,000. Equivalent units, unit costs, cost of completed units and ending WIP.
7. **6 pts**
Budgeted sales 2,400 units; desired ending inventory 360; beginning 300. Units to produce? If each unit needs 2 lb of material at \$3, with no material inventories, the materials cost?
8. **7 pts**
Beginning cash \$12,000. Collections: 50% in month, 50% next month. Sales: May \$40,000, June \$60,000. June payments \$58,000. Minimum cash \$10,000. Ending June cash and any borrowing?
9. **5 pts**
Flexible budget: \$5 variable per unit plus \$30,000 fixed. Actual 8,000 units cost \$72,500. Flexible budget and variance?
10. **5 pts**
FV of \$4,000 at 6% for 8 years? PV of \$10,000 in 5 years at 8%?

11. **8 pts**

A machine costs \$36,000 and saves \$10,000 a year for 5 years; required rate 10% (annuity factor 3.7908). Payback and NPV? Decision?

12. **5 pts**

What did Franklin's will provide for Boston and Philadelphia, and what did he expect after 100 years?

13. **4 pts**

What did Carnegie require of his managers, and why did it give him an advantage?

14. **18 pts**

Essay: Using Ford, Carnegie, Joseph or Hershey, explain how managerial accounting helps a business serve its stakeholders over the long run. Include at least two tools from this unit and one passage of Scripture (Luke 14:28, Proverbs 21:5 or Matthew 25:27).

15. **6 pts**

Name four checks that show a complete set of books is internally consistent.

ANSWER KEY

1. Fixed; variable; mixed; variable.
2. \$24; 40%; 2,000 units; \$120,000.
3. 3,000 units; 20%.
4. \$2.00 per hour; \$3,200.
5. \$15 per DLH; $3,400 + 1,200 + 750 = \$5,350$.
6. Materials EU 12,000 $\rightarrow$ \$3.00; conversion EU 10,200 $\rightarrow$ \$5.00. Completed $9,000 \times 8 = 72,000$; WIP $9,000 + 6,000 = 15,000$; total 87,000.
7. 2,460 units; 4,920 lb; \$14,760.
8. Collections $30,000 + 20,000 = 50,000$; cash before borrowing 4,000; borrow 6,000; ending 10,000.
9. 70,000; \$2,500 unfavorable.
10. $\approx \$6,375$; $\approx \$6,806$.
11. 3.6 years; PV 37,908; NPV \$1,908; accept.
12. £1,000 each, lent at 5% to young married craftsmen; he expected about £131,000 after 100 years, part for public works and the rest lent again for another century.
13. Daily cost sheets showing the cost of each department's output; knowing exact costs let him price aggressively, invest in better processes and catch waste.
14. A strong answer explains, with accurate history, how break-even and cost knowledge (Ford, Carnegie), budgets (Joseph) or careful records and reinvestment (Hershey) allowed lower prices, steadier jobs and lasting gifts; names the stakeholders served and any who were not; and applies the verse to counting the cost, diligent planning or faithful stewardship.
15. Every journal entry balances; the trial balance (and adjusted and post-closing trial balances) balance; net income on the income statement equals the amount closed to capital and shown on the statement of owner's equity; the balance sheet balances with ending capital; the cash-flow statement's net change equals the change in the balance-sheet cash; subsidiary ledgers agree with control accounts (any four).

PORTFOLIO PIECE: THE CAPSTONE BOOKS

Present the complete books of the capstone business (Weaver Fudge or your own, with approval) for one quarter: journals, ledgers, monthly trial balances, worksheets, monthly and quarterly statements, closing entries and post-closing trial balance. Add a managerial section: break-even analysis, a three-month cash budget, one NPV decision, and ratio analysis. End with a two-page letter to a banker or investor and a stakeholder report, and a one-paragraph reflection on what this course taught you about honesty and stewardship.

LOOK FOR	WHAT IT MEANS
Complete, balanced books	Every month's journals, ledgers and trial balances complete and balanced; corrections honest.
Statements	Monthly and quarterly statements properly headed, articulating, with cash flows proved.
Managerial analysis	Break-even, cash budget, NPV and ratios correct and clearly explained.
Letter and stakeholder report	A clear, honest case for the business's strengths and risks, with all six stakeholders considered.
Reflection	A thoughtful paragraph connecting the work to honesty and stewardship.

MIDTERM EXAM

Covers Units 1–5. Time: 100 minutes.

You have 100 minutes. A calculator is allowed; no notes. Show your work for every calculation: write the entry, the formula or the steps, then the numbers. Every journal entry must have equal debits and credits and an account title for each line. Correct work earns partial credit even if an amount slips. Answer the essay in a well-organized paragraph or two. The exam has 25 problems worth a total of 100 points.

1. **3 pts** Lesson 1.1

What did Luca Pacioli publish in Venice in 1494, and why was it important to accounting?

2. **3 pts** Lesson 1.2

A business has assets of \$85,000 and liabilities of \$32,000. What is equity? It then borrows \$10,000 cash from a bank. Give the new totals.

3. **4 pts** Lesson 1.2

Beginning equity \$40,000; owner investment \$5,000; revenue \$62,000; expenses \$48,500; withdrawals \$9,000. Net income and ending equity?

4. **4 pts** Lesson 1.3

Journalize: a truck costing \$28,000 is bought with \$8,000 cash and a note for the rest.

5. **3 pts** Lesson 1.4

Number these in a chart of accounts (100s–500s): Utilities Expense, Owner's Drawing, Accounts Receivable, Notes Payable, Fees Earned, Cash.

6. **3 pts** Lesson 1.5

Name the principle: (a) the owner's personal car loan is kept out of the books; (b) a building stays at its cost; (c) statements are prepared every year.

7. **3 pts** Lesson 2.1

Give the normal balance of: Unearned Revenue, Supplies Expense, Owner's Capital, Prepaid Insurance, Accumulated Depreciation, Drawing.

8. **5 pts** Lesson 2.2

Journalize: (a) bills a client \$2,500; (b) pays utilities \$400; (c) collects \$1,500 from the client; (d) owner withdraws \$700.

9. **5 pts** Lesson 2.4

Prepare a trial balance: Cash 6,400; Accounts Receivable 2,100; Supplies 500; Equipment 12,000; Accounts Payable 1,900; Notes Payable 5,000; Capital 11,000; Drawing 1,200; Revenue 9,800; Wages Expense 3,800; Rent Expense 1,700.

10. **4 pts** Lesson 2.5

A trial balance's debits exceed its credits by \$270. Name three single errors that could cause this.

11. **3 pts** Lesson 2.5

A \$650 purchase of equipment was debited to Supplies. Write the correcting entry.

12. **4 pts** Lesson 3.1

In March a firm earns \$18,000 (collects \$14,000 of it in March) and collects \$3,000 for February work. It incurs \$11,000 of March expenses (pays \$9,500 in March) and pays \$1,200 of February bills. Net income on the accrual and cash bases?

13. **5 pts** Lesson 3.2

Journalize the December 31 adjustments: (a) Supplies balance \$1,450, on hand \$380; (b) a 12-month insurance policy costing \$2,400 was bought September 1; (c) \$3,000 received November 1 for 6 months of service; (d) wages owed \$640.

14. **3 pts** Lesson 3.2

Equipment costs \$26,000, salvage \$2,000, life 8 years. Monthly straight-line depreciation?

15. **3 pts** Lesson 3.3

A worksheet's Income Statement columns total Dr \$41,200 and Cr \$52,600. Net income or loss, and where is it entered?

16. **5 pts** Lesson 3.4

Revenue \$30,000; Rent Expense \$6,000; Wages Expense \$14,000; Utilities Expense \$1,500; Drawing \$4,000; beginning capital \$25,000. Journalize the closing entries and find ending capital.

17. **5 pts** Lesson 4.1

Gross sales \$240,000; sales returns \$5,000; cost of goods sold \$141,000; operating expenses \$61,000; interest expense \$2,500. Compute net sales, gross profit, operating income, net income and gross margin.

18. **4 pts** Lesson 4.3

Current assets \$48,000; current liabilities \$20,000. Working capital and current ratio?

19. **5 pts** Lesson 4.4

Net income \$26,000; depreciation \$5,000; accounts receivable increased \$3,000; inventory decreased \$2,000; accounts payable decreased \$1,500; accrued liabilities increased \$700. Operating cash flow (indirect)?

20. **3 pts** Lesson 4.4

Classify: purchase of equipment; owner investment; cash paid to suppliers.

21. **5 pts** Lesson 5.1

Bank balance \$9,140; book balance \$7,355; deposit in transit \$1,600; outstanding checks \$2,250; service charge \$15; NSF check \$400; the bank collected a \$900 note and \$20 interest; a \$290 check for supplies was recorded in the books as \$920. Prepare both sides.

22. **4 pts** Lesson 5.2

A \$300 petty cash fund has vouchers for postage \$64.20, supplies \$118.35 and delivery \$72.00; cash on hand is \$43.15. Journalize the replenishment.

23. **3 pts** Lesson 5.3

Which three duties should be separated, and why?

24. **4 pts** Lesson 5.4

A company earning \$6 million pays \$9 million of dividends year after year and keeps its books secret. How much comes from capital each year, and what does the Kreuger case teach about such a pattern?

25. **7 pts** Lesson 5.5

Short essay: Your supervisor asks you to record a large sale in December that will ship in January, to meet a loan covenant. Using the six-step method and one AICPA principle, explain what you would do and why.

ANSWER KEY

1. The *Summa de arithmetica*, which clearly explained the Venetian method of double-entry bookkeeping; printing spread the method across Europe. He did not invent it.
2. Equity \$53,000. After borrowing: assets \$95,000 = liabilities \$42,000 + equity \$53,000.
3. Net income \$13,500; ending equity $40,000 + 5,000 + 13,500 - 9,000 = \$49,500$.
4. Debit Equipment (Truck) \$28,000; credit Cash \$8,000; credit Notes Payable \$20,000.
5. 101 Cash; 111 Accounts Receivable; 211 Notes Payable; 302 Drawing; 401 Fees Earned; 5xx Utilities Expense.
6. (a) Business entity; (b) cost principle; (c) periodicity.
7. Credit, debit, credit, debit, credit, debit.
8. (a) Dr A/R 2,500, Cr Fees Earned 2,500. (b) Dr Utilities Expense 400, Cr Cash 400. (c) Dr Cash 1,500, Cr A/R 1,500. (d) Dr Drawing 700, Cr Cash 700.
9. Debits: $6,400 + 2,100 + 500 + 12,000 + 1,200 + 3,800 + 1,700 = \$27,700$. Credits: $1,900 + 5,000 + 11,000 + 9,800 = \$27,700$.
10. A \$270 debit with no credit; a \$135 credit posted as a debit; a transposition ($270 \div 9 = 30$), such as a \$140 debit posted as \$410.
11. Debit Equipment \$650; credit Supplies \$650.
12. Accrual: $18,000 - 11,000 = \$7,000$. Cash: $(14,000 + 3,000) - (9,500 + 1,200) = \$6,300$.
13. (a) Dr Supplies Expense 1,070, Cr Supplies 1,070. (b) Dr Insurance Expense 800, Cr Prepaid Insurance 800. (c) Dr Unearned Revenue 1,000, Cr Service Revenue 1,000. (d) Dr Wages Expense 640, Cr Wages Payable 640.
14. $(26,000 - 2,000) \div 8 = 3,000$ a year; \$250 a month.
15. Net income \$11,400, entered in the Income Statement debit column and the Balance Sheet credit column.
16. Dr Revenue 30,000, Cr Income Summary 30,000. Dr Income Summary 21,500; Cr Rent 6,000, Wages 14,000, Utilities 1,500. Dr Income Summary 8,500, Cr Capital 8,500. Dr Capital 4,000, Cr Drawing 4,000. Ending capital \$29,500.
17. Net sales 235,000; gross profit 94,000; operating income 33,000; net income 30,500; gross margin $94,000 \div 235,000 = 40\%$.
18. \$28,000; 2.4.

19. $26,000 + 5,000 - 3,000 + 2,000 - 1,500 + 700 = \$29,200$.
20. Investing; financing; operating.
21. Bank: $9,140 + 1,600 - 2,250 = \$8,490$. Book: $7,355 + 900 + 20 + 630 - 15 - 400 = \$8,490$.
22. Vouchers 254.55; shortage 2.30. Dr Postage 64.20, Supplies Expense 118.35, Delivery Expense 72.00, Cash Short and Over 2.30; Cr Cash 256.85.
23. Authorization, custody of assets and recording (with independent reconciliation), so no one person can both take an asset and hide it.
24. \$3 million a year from capital; returns that profits cannot support, with secrecy, are a classic sign of fraud, as with Kreuger's empire before 1932.
25. A strong answer gets the facts, names the issue (revenue recognized early misleads the bank), cites revenue recognition and integrity or the public interest, considers options, declines to record it early, offers honest disclosure of the backlog, escalates if pressed, and documents the conversation.

FINAL EXAM

Covers Units 1–10. Time: 120 minutes.

You have 120 minutes. A calculator is allowed; no notes. Show your work for every calculation: write the entry, the formula or the steps, then the numbers. Every journal entry must balance. Correct work earns partial credit even if an amount slips. Answer the essay in a well-organized response of several paragraphs. The exam has 29 problems worth a total of 100 points.

1. **3 pts** Lesson 1.2

Assets \$210,000; owner's equity \$130,000. Liabilities? What happens to each part of the equation when the business pays \$15,000 of its liabilities?

2. **3 pts** Lesson 2.2

Journalize: a computer costing \$1,800 is bought with \$600 cash and the rest on account.

3. **3 pts** Lesson 3.2

A \$15,000, 8% note was signed October 1. Journalize the December 31 interest accrual.

4. **3 pts** Lesson 3.4

Which of these appear on a post-closing trial balance: Cash, Fees Earned, Accumulated Depreciation, Drawing, Unearned Revenue, Wages Expense?

5. **3 pts** Lesson 4.2

Beginning capital \$60,000; investment \$10,000; net loss \$4,000; withdrawals \$18,000. Ending capital? If liabilities are \$35,000, what are total assets?

6. **3 pts** Lesson 4.4

Net income \$18,000; depreciation \$4,000; receivables increased \$5,000; inventory increased \$3,000; accounts payable increased \$2,500. Operating cash flow?

7. **3 pts** Lesson 5.1

Which reconciling items require journal entries: deposit in transit, bank service charge, outstanding check, NSF check, interest earned?

8. **3 pts** Lesson 6.1

A \$6,500 sale on terms 2/10, n/30 is paid within 10 days. Journalize the collection.

9. **3 pts** Lesson 6.2

Aging shows a required allowance of \$4,350. The allowance has a \$300 debit balance before adjustment. Receivables are \$92,000. Journalize the adjustment and give net realizable value.

10. **4 pts** Lesson 6.4

Beginning inventory 50 units at \$8; purchases 100 units at \$9 and 50 units at \$11; 140 units sold. Compute ending inventory and COGS under FIFO, LIFO and weighted average.

11. **3 pts** Lesson 6.5

Cost \$18; price \$30. Markup on cost and gross margin?

12. **3 pts** Lesson 7.1

Equipment cost \$64,000, salvage \$4,000, life 6 years, straight-line. After 4 years it is sold for \$21,000. Book value and gain or loss? Journalize.

13. **3 pts** Lesson 7.2

An asset costs \$30,000, salvage \$3,000, life 5 years. Double-declining-balance depreciation for years 1-3?

14. **3 pts** Lesson 7.3

An \$18,000, 7%, 9-month note is signed June 1. Journalize the December 31 accrual and the March 1 payment.

15. **3 pts** Lesson 7.4

An employee works 44 hours at \$20 (overtime at 1.5×). Federal withholding \$70; Social Security 6.2%; Medicare 1.45%. Net pay? Employer taxes with FUTA 0.6% and SUTA 2.7%?

16. **3 pts** Lesson 7.5

\$200,000 of 5% bonds pay interest semiannually and were issued at a \$4,000 discount, amortized straight-line over 20 periods. Interest expense per period?

17. **3 pts** Lesson 8.1

Partners A and B: salaries \$24,000 and \$18,000; 10% interest on capitals of \$50,000 and \$30,000; remainder shared equally. Net income \$70,000. Divide it.

18. **3 pts** Lesson 8.3

Journalize issuing 8,000 shares of \$1 par common stock at \$14.

19. **3 pts** Lesson 8.3

4,000 shares of 6%, \$100 par cumulative preferred; one year in arrears; \$60,000 of dividends declared. Divide between preferred and common.

20. **3 pts** Lesson 8.4

Beginning retained earnings \$180,000; net income \$64,000; dividends \$22,000. Ending retained earnings?

21. **3 pts** Lesson 8.5

A church receives \$8,000 restricted for a youth trip and spends \$6,500 on the trip. How are the gift and the spending classified?

22. **4 pts** Lesson 9.1

Current assets \$120,000 (cash 25,000; receivables 35,000; inventory 55,000; prepaid 5,000); current liabilities \$75,000; total liabilities \$210,000; total assets \$420,000. Current ratio, quick ratio and debt ratio?

23. **4 pts** Lesson 9.2

Net income \$45,000; sales \$900,000; average assets \$450,000; average equity \$225,000. Margin, asset turnover, ROA, equity multiplier and ROE?

24. **4 pts** Lesson 9.3

Name the two audit procedures required after the McKesson & Robbins fraud, and two provisions of the Sarbanes-Oxley Act.

25. **4 pts** Lesson 10.1

Price \$80; variable cost \$50; fixed costs \$90,000. Break-even units and sales, and units to earn \$30,000?

26. **3 pts** Lesson 10.2

A job uses \$5,000 of materials and 80 labor hours at \$30; overhead is applied at 120% of direct labor cost. Job cost?

27. **4 pts** Lesson 10.4

A machine costs \$20,000 and saves \$6,000 a year for 4 years; required rate 8% (annuity factor 3.3121). NPV and decision?

28. **3 pts** Lesson 10.3

Beginning cash \$9,000; collections \$52,000; payments \$58,500; minimum balance \$5,000. How much must be borrowed, and what is ending cash?

29. **10 pts** Lesson All

Essay: “Be thou diligent to know the state of thy flocks” (Proverbs 27:23). Using at least three people from the course (for example Pacioli, Datini, Fugger, Washington, Wedgwood, Kreuger, Carnegie, Müller, Hershey) and at least four accounting tools, explain why honest, careful accounting is a form of stewardship that serves all six stakeholders.

ANSWER KEY

1. Liabilities \$80,000. After payment: assets \$195,000 = liabilities \$65,000 + equity \$130,000.
2. Dr Equipment 1,800; Cr Cash 600; Cr Accounts Payable 1,200.
3. $15,000 \times 0.08 \times 3/12 = 300$. Dr Interest Expense 300; Cr Interest Payable 300.
4. Cash, Accumulated Depreciation, Unearned Revenue.
5. Ending capital \$48,000; total assets \$83,000.
6. $18,000 + 4,000 - 5,000 - 3,000 + 2,500 = \$16,500$.
7. Bank service charge, NSF check, interest earned (book-side items).
8. Dr Cash 6,370; Dr Sales Discounts 130; Cr Accounts Receivable 6,500.
9. Adjustment 4,650: Dr Bad Debt Expense 4,650, Cr Allowance 4,650. NRV $92,000 - 4,350 = \$87,650$.
10. Available 200 units, \$1,850; ending 60 units. FIFO: ending $50 \times 11 + 10 \times 9 = 640$, COGS 1,210. LIFO: ending $50 \times 8 + 10 \times 9 = 490$, COGS 1,360. Average \$9.25: ending 555, COGS 1,295.
11. 66.7%; 40%.
12. Annual 10,000; book value $64,000 - 40,000 = 24,000$; loss 3,000. Dr Cash 21,000, Accumulated Depreciation 40,000, Loss 3,000; Cr Equipment 64,000.
13. 40%; 12,000; 7,200; 4,320.
14. Dec 31: $18,000 \times 0.07 \times 7/12 = 735$; Dr Interest Expense 735, Cr Interest Payable 735. Mar 1: total interest 945; Dr Notes Payable 18,000, Interest Payable 735, Interest Expense 210; Cr Cash 18,945.
15. Gross 920; SS 57.04; Medicare 13.34; net 779.62. Employer: $57.04 + 13.34 + 5.52 + 24.84 = \$100.74$.
16. $5,000 + 200 = \$5,200$.
17. Interest 5,000 and 3,000; remainder $70,000 - 42,000 - 8,000 = 20,000$, 10,000 each. A \$39,000; B \$31,000.
18. Dr Cash 112,000; Cr Common Stock 8,000; Cr APIC 104,000.
19. Annual preferred 24,000; preferred receive 48,000; common 12,000.
20. \$222,000.
21. The \$8,000 is a contribution with donor restrictions; when \$6,500 is spent, \$6,500 is released to net assets without donor restrictions to match the trip expense; \$1,500 remains restricted.

22. 1.6 ; $60,000 \div 75,000 = 0.8$; 50% .
23. 5% ; 2.0 ; 10% ; 2.0 ; 20% .
24. Observation of inventory counts and confirmation of receivables. SOX: PCAOB, CEO/CFO certification, internal control reports, auditor independence, whistleblower protection (any two).
25. CM 30 ; $3,000$ units; $\$240,000$; $4,000$ units.
26. DL $2,400$; overhead $2,880$; total $\$10,280$.
27. $PV \approx 19,873$; $NPV \approx -127$; reject (it does not quite earn 8%).
28. Before borrowing $2,500$; borrow $2,500$ (or the next lending unit); ending cash $\$5,000$.
29. A strong answer accurately uses three historical examples, ties each to specific tools (double entry, the trial balance, adjusting entries, the four statements, internal control, audits, cost accounting, budgets, present value), names how financiers, owners, builders, workers, customers and the community depend on honest books, and connects diligence and honesty to the verse.