

GRADE 6 BUSINESS & FINANCE

First edition

8 units

32 lessons + bonus business unit

A video for every lesson

FIRST EDITION

COURSE GUIDE

This course follows eight strands of business and finance through one school year: work and trade, the story of money, markets, great businesses, workers and owners, entrepreneurship and sales, accounting, and saving, investing and giving. Each unit is built around real moments from history: Richard Arkwright building a cotton mill beside a Derbyshire stream, John Harrison spending forty years on a clock that could find a ship's place at sea, Spanish silver from Potosí flooding the world, the founding of the Bank of England in 1694 and the Federal Reserve in 1913, Rowland Hill's penny post, Matthew Boulton and James Watt selling "power," George Cadbury's factory in a garden, Toyota's workers pulling the cord to stop the line, the mill girls of Lowell, Lord Shaftesbury's Factory Acts, Samuel Gompers and the trade unions, the Fair Labor Standards Act of 1938, Jacob Davis's riveted work pants, the Sears, Roebuck catalog, and the brokers of the New York Stock Exchange.

Every lesson follows the same path. First comes **the story**. Then **how they figured it out**: what problem stood in the way, what they tried, what failed, what they measured and what they changed. Then **the big idea** underneath, explained for a sixth grader with real vocabulary and, where it helps, a simple formula worked with numbers: productivity, comparative advantage, the price index and percent change, elasticity, debits and credits, the trial balance, cash flow, and compound interest, $A = P(1 + r)^n$. Then **in business today**: how families, shops, companies and banks use the idea now, and what a wise and honest person does with it. Last, the student does it in miniature with coins, a calculator, price tags, receipts, a free spreadsheet and a ledger notebook.

Great businesses are weighed by what they meant for **six stakeholders**: the financiers who lent or invested the money, the risk-takers who started them, the builders who designed and made the product, the workers, the customers and the community. A business is great when it creates real value and serves all six over a long time. The year ends with a family market day, and an optional bonus unit, **Run**

a **Real Business**, walks the student through writing a plan, setting up double-entry books, running a small business for a month with a parent, and closing the month with an income statement, a cash-flow summary and a balance sheet.

Most videos come from the Federal Reserve banks, Khan Academy, Accounting Stuff, museums such as the Science and Industry Museum in Manchester, the National Park Service and a few trusted teaching channels chosen lesson by lesson. Every video was checked for content and accuracy before it was chosen, and none comes from a channel that takes sides in present-day public debates. A few of the sixth-grade videos are aimed at high-school or beginning college students; the lesson tells you where to pause and what to skip. Some channels end with an invitation to subscribe or a short advertisement; you can stop the video when the teaching ends.

Start with Lesson 1.1 →

WHO IT IS FOR

Written for students in grade 6 (about ages 11–12) who read independently and can work with decimals, percents, simple ratios and a calculator. A parent or teacher reads along, plays customer, banker or business owner in the projects, and supervises all real selling and money handling. Nothing needs to be bought beyond ordinary household items: coins, play money, a calculator, a kitchen scale, index cards, store flyers, receipts, graph paper and, if you have one, a computer with a free spreadsheet.

HOW TO USE THIS COURSE

1. **The weekly rhythm.** The year has 32 lessons, one a week. Session 1 (about 50 minutes) is the warm-up, the video, the teaching and the picture study. Session 2 (about 50 minutes) is the project and the ledger notebook. In the last week of each unit, add a third session for the unit review and the portfolio project.
2. **Story, then the big idea.** The core ideas are written for the student to read, with a parent reading along. The paragraphs marked *The story* and *How they figured it out* tell what happened; *The big idea* explains the principle underneath, often with a formula and a worked number; *In business today* shows how people use it now. After each paragraph, ask the student to tell it back in his or her own words, and to redo any worked number without looking.

3. **Show the numbers.** Sixth grade adds simple formulas: profit = revenue – costs; percent change = $(\text{new} - \text{old}) \div \text{old} \times 100$; assets = liabilities + owner's equity; $A = P(1 + r)^n$. Ask the student to write the formula first, then the numbers with their units, then the answer with its unit, and then one sentence saying what the answer means.
4. **Picture study.** Each lesson has one public-domain painting, print, document or historic photograph. Look at it quietly for two minutes. Then put it away and have the student tell everything he or she remembers. Bring it back and work through the “look for” items and questions, which point to the work, trade or money in the picture.
5. **The ledger notebook.** Use one graph-paper composition book for the whole year. Every project ends with something counted and written down: a productivity table, a price index, a demand schedule, a journal and ledger, a trial balance, a cash-flow table, a compound-interest table or a stakeholder scorecard. Date every page and write one sentence about what you would change. Honest records matter more than big numbers: “a just weight is his delight” (Proverbs 11:1).
6. **The six stakeholders.** Whenever the course looks at a business, ask what it meant for the financiers, the risk-takers, the builders, the workers, the customers and the community. Unit 4 uses a stakeholder scorecard with a 1–5 rating and a reason for each; use it all year, for businesses in history and for shops in your own town.
7. **Optional books and games.** Some units list free classics such as Benjamin Franklin's *The Way to Wealth* and Leonard Read's essay *I, Pencil*, free teaching sites and family games. They are extras. Every lesson can be completed without them.
8. **Unit review and portfolio.** Each unit ends with a review worth 100 points, with several worked calculations and a short written answer, and a portfolio project that pulls the unit together, such as a price index of your own family's basket, a stakeholder report, a business plan, a month of journal and ledger pages or a savings plan. Keep the portfolio pages in one folder for the year.
9. **Money and selling safety.** A parent supervises all selling and all handling of real money. Never sell door to door or meet strangers alone, never give out personal information, passwords or card numbers, and do not sell or open accounts online without a parent. Check your town's rules before selling food or setting up a stand. The student never borrows or lends money without a parent, and all investing in this course is practice with pretend money.

10. **The family market day.** In the last week of Unit 8, the student sets up a table with the best project from each unit and its ledger pages, sells or shows something he or she has made, and explains to family and guests how it was priced, what it cost and what it earned.
11. **Run a Real Business (optional bonus unit).** Unit 9 walks the student through a written plan, a set of double-entry books, a month of real trading with a parent, and a closing set of statements and a gift. Use it after market day, over the summer, or alongside the year.

SCOPE AND SEQUENCE

UNIT 1 • WEEKS 1–4

Work, Trade and Productivity

Capital goods and productivity; Richard Arkwright's mill and the factory system; comparative advantage worked with numbers; and work as a calling, seen in John Harrison's forty years on the sea clock.

- 1.1 Capital Goods and Productivity: McCormick's Reaper
- 1.2 Arkwright's Mill and the Factory System
- 1.3 Comparative Advantage: Why Trade Pays, with Numbers
- 1.4 Called to Work: John Harrison and the Longitude Clock

UNIT 2 • WEEKS 5–8

The Story of Money

Money's three jobs and the stones of Yap; Spanish silver and the great price rise; the Bank of England, the Federal Reserve and what central banks do; and measuring inflation with a price index.

- 2.1 Money's Three Jobs: The Stones of Yap
- 2.2 Spanish Silver and the Great Price Rise
- 2.3 Central Banks: The Bank of England and the Federal Reserve
- 2.4 Measuring Inflation: The Price Index, with Numbers

UNIT 3 • WEEKS 9–12

Markets

Demand curves and elasticity in Rowland Hill's penny post; the four market structures; price ceilings and the gas lines of 1979; and natural monopolies, from Edison's Pearl Street station to the utility commission.

- 3.1 Demand Curves and Elasticity: Rowland Hill's Penny Post
- 3.2 The Four Market Structures
- 3.3 Price Ceilings and Shortages: The Gas Lines of 1979
- 3.4 Natural Monopolies: Edison's Pearl Street Station and the Utility Commission

UNIT 5 • WEEKS 17–20

Workers, Owners and Fair Rules

The gains and costs of factory work for the mill girls of Lowell; Lord Shaftesbury and the Factory Acts; Samuel Gompers and peaceful bargaining by trade unions; and the Fair Labor Standards Act of 1938, with a rule that went wrong.

- 5.1 The Mill Girls of Lowell: The Gains and Costs of Factory Work
- 5.2 The Factory Acts and Lord Shaftesbury
- 5.3 Samuel Gompers and the Trade Unions
- 5.4 The Fair Labor Standards Act of 1938: The Forty-Hour Week

UNIT 4 • WEEKS 13–16

Great Businesses and Their Stakeholders

Stakeholder scorecards for the Hudson's Bay Company, Boulton & Watt, Cadbury's Bournville and Toyota's production system.

- 4.1 The Hudson's Bay Company: Three Centuries of Trade
- 4.2 Boulton & Watt: Selling Power
- 4.3 Cadbury's Bournville: A Factory in a Garden
- 4.4 Toyota's Production System: Stop the Line, Fix the Problem

UNIT 6 • WEEKS 21–24

Entrepreneurship and Sales

Writing a business plan, from Jacob Davis's letter about riveted pants; market research; the four P's of marketing with H. J. Heinz; and reaching distant customers with the Sears, Roebuck catalog.

- 6.1 The Business Plan: Jacob Davis's Letter and the Riveted Pants
- 6.2 Market Research: Asking Before You Build
- 6.3 The Four P's of Marketing: H. J. Heinz and the Pickle Pin
- 6.4 Reaching the Customer: The Sears, Roebuck Catalog

UNIT 7 • WEEKS 25–28

Accounting

The journal and the ledger with debits and credits; the trial balance; the income statement and Josiah Wedgwood’s discovery of his costs; and cash flow, or why profit is not cash.

- 7.1 The Journal and the Ledger: Debits and Credits
- 7.2 The Trial Balance: Checking the Books
- 7.3 The Income Statement: Wedgwood Counts His Costs
- 7.4 Cash Flow: Profit Is Not Cash

UNIT 8 • WEEKS 29–32

Saving, Investing and Giving

Compound interest with a formula and Henry Duncan’s savings bank; stocks and the New York Stock Exchange; bonds and Alexander Hamilton’s plan; and credit, debt, giving and the family market day.

- 8.1 Compound Interest with a Formula: Henry Duncan’s Savings Bank
- 8.2 Stocks and the New York Stock Exchange
- 8.3 Bonds: Lending to Governments and Companies
- 8.4 Credit, Debt, Giving and the Family Market Day

UNIT 9 • WEEKS 33–36

Bonus: Run a Real Business

Optional bonus unit: write a plan, set up the books, run a small business for a month with a parent, and close the month with statements, lessons learned and a gift.

- 9.1 Write the Plan and Find the Start-up Money
- 9.2 Set Up the Books: Rockefeller’s Ledger A
- 9.3 Run It for a Month: Lydia, a Seller of Purple
- 9.4 Close the Month: Statements, Lessons and Giving

WEEKLY PACING CALENDAR

WEEK	PLAN
1	• Session 1: Lesson 1.1 Capital Goods and Productivity: McCormick’s Reaper: warm-up, video, teaching and picture study • Session 2: Lesson 1.1 project and ledger notebook

WEEK	PLAN
	<i>Two sessions a week is the usual rhythm. Younger children can split a long session in two; older students can do both sessions in one sitting.</i>
2	- Session 1: Lesson 1.2 Arkwright's Mill and the Factory System: warm-up, video, teaching and picture study - Session 2: Lesson 1.2 project and ledger notebook
3	- Session 1: Lesson 1.3 Comparative Advantage: Why Trade Pays, with Numbers: warm-up, video, teaching and picture study - Session 2: Lesson 1.3 project and ledger notebook
4	- Session 1: Lesson 1.4 Called to Work: John Harrison and the Longitude Clock: warm-up, video, teaching and picture study - Session 2: Lesson 1.4 project and ledger notebook - Session 3: Unit 1 review and portfolio project
5	- Session 1: Lesson 2.1 Money's Three Jobs: The Stones of Yap: warm-up, video, teaching and picture study - Session 2: Lesson 2.1 project and ledger notebook
6	- Session 1: Lesson 2.2 Spanish Silver and the Great Price Rise: warm-up, video, teaching and picture study - Session 2: Lesson 2.2 project and ledger notebook
7	- Session 1: Lesson 2.3 Central Banks: The Bank of England and the Federal Reserve: warm-up, video, teaching and picture study - Session 2: Lesson 2.3 project and ledger notebook
8	- Session 1: Lesson 2.4 Measuring Inflation: The Price Index, with Numbers: warm-up, video, teaching and picture study - Session 2: Lesson 2.4 project and ledger notebook - Session 3: Unit 2 review and portfolio project
9	- Session 1: Lesson 3.1 Demand Curves and Elasticity: Rowland Hill's Penny Post: warm-up, video, teaching and picture study - Session 2: Lesson 3.1 project and ledger notebook
10	Session 1: Lesson 3.2 The Four Market Structures: warm-up, video, teaching and picture study

WEEK	PLAN
	Session 2: Lesson 3.2 project and ledger notebook
11	- Session 1: Lesson 3.3 Price Ceilings and Shortages: The Gas Lines of 1979: warm-up, video, teaching and picture study - Session 2: Lesson 3.3 project and ledger notebook
12	- Session 1: Lesson 3.4 Natural Monopolies: Edison's Pearl Street Station and the Utility Commission: warm-up, video, teaching and picture study - Session 2: Lesson 3.4 project and ledger notebook - Session 3: Unit 3 review and portfolio project
13	- Session 1: Lesson 4.1 The Hudson's Bay Company: Three Centuries of Trade: warm-up, video, teaching and picture study - Session 2: Lesson 4.1 project and ledger notebook
14	- Session 1: Lesson 4.2 Boulton & Watt: Selling Power: warm-up, video, teaching and picture study - Session 2: Lesson 4.2 project and ledger notebook
15	- Session 1: Lesson 4.3 Cadbury's Bournville: A Factory in a Garden: warm-up, video, teaching and picture study - Session 2: Lesson 4.3 project and ledger notebook
16	- Session 1: Lesson 4.4 Toyota's Production System: Stop the Line, Fix the Problem: warm-up, video, teaching and picture study - Session 2: Lesson 4.4 project and ledger notebook - Session 3: Unit 4 review and portfolio project
17	- Session 1: Lesson 5.1 The Mill Girls of Lowell: The Gains and Costs of Factory Work: warm-up, video, teaching and picture study - Session 2: Lesson 5.1 project and ledger notebook
18	- Session 1: Lesson 5.2 The Factory Acts and Lord Shaftesbury: warm-up, video, teaching and picture study - Session 2: Lesson 5.2 project and ledger notebook

WEEK	PLAN
19	• Session 1: Lesson 5.3 Samuel Gompers and the Trade Unions: warm-up, video, teaching and picture study • Session 2: Lesson 5.3 project and ledger notebook
20	• Session 1: Lesson 5.4 The Fair Labor Standards Act of 1938: The Forty-Hour Week: warm-up, video, teaching and picture study • Session 2: Lesson 5.4 project and ledger notebook • Session 3: Unit 5 review and portfolio project
21	• Session 1: Lesson 6.1 The Business Plan: Jacob Davis's Letter and the Riveted Pants: warm-up, video, teaching and picture study • Session 2: Lesson 6.1 project and ledger notebook
22	• Session 1: Lesson 6.2 Market Research: Asking Before You Build: warm-up, video, teaching and picture study • Session 2: Lesson 6.2 project and ledger notebook
23	• Session 1: Lesson 6.3 The Four P's of Marketing: H. J. Heinz and the Pickle Pin: warm-up, video, teaching and picture study • Session 2: Lesson 6.3 project and ledger notebook
24	• Session 1: Lesson 6.4 Reaching the Customer: The Sears, Roebuck Catalog: warm-up, video, teaching and picture study • Session 2: Lesson 6.4 project and ledger notebook • Session 3: Unit 6 review and portfolio project
25	• Session 1: Lesson 7.1 The Journal and the Ledger: Debits and Credits: warm-up, video, teaching and picture study • Session 2: Lesson 7.1 project and ledger notebook
26	• Session 1: Lesson 7.2 The Trial Balance: Checking the Books: warm-up, video, teaching and picture study • Session 2: Lesson 7.2 project and ledger notebook
27	• Session 1: Lesson 7.3 The Income Statement: Wedgwood Counts His Costs: warm-up, video, teaching and picture study • Session 2: Lesson 7.3 project and ledger notebook

WEEK	PLAN
28	• Session 1: Lesson 7.4 Cash Flow: Profit Is Not Cash: warm-up, video, teaching and picture study • Session 2: Lesson 7.4 project and ledger notebook • Session 3: Unit 7 review and portfolio project
29	• Session 1: Lesson 8.1 Compound Interest with a Formula: Henry Duncan's Savings Bank: warm-up, video, teaching and picture study • Session 2: Lesson 8.1 project and ledger notebook
30	• Session 1: Lesson 8.2 Stocks and the New York Stock Exchange: warm-up, video, teaching and picture study • Session 2: Lesson 8.2 project and ledger notebook
31	• Session 1: Lesson 8.3 Bonds: Lending to Governments and Companies: warm-up, video, teaching and picture study • Session 2: Lesson 8.3 project and ledger notebook
32	• Session 1: Lesson 8.4 Credit, Debt, Giving and the Family Market Day: warm-up, video, teaching and picture study • Session 2: Lesson 8.4 project and ledger notebook • Session 3: Unit 8 review and portfolio project <i>Last week. Hold a family market day: the student sets up a table with the best project from each unit and its notebook pages, sells or shows something they made, and explains to guests how they priced it and what they earned.</i>
33	• Session 1: Lesson 9.1 Write the Plan and Find the Start-up Money: warm-up, video, teaching and picture study • Session 2: Lesson 9.1 project and ledger notebook <i>Optional bonus unit: run a real small business. Do it after market day, over the summer, or alongside the year.</i>
34	• Session 1: Lesson 9.2 Set Up the Books: Rockefeller's Ledger A: warm-up, video, teaching and picture study • Session 2: Lesson 9.2 project and ledger notebook

WEEK	PLAN
35	• Session 1: Lesson 9.3 Run It for a Month: Lydia, a Seller of Purple: warm-up, video, teaching and picture study • Session 2: Lesson 9.3 project and ledger notebook
36	• Session 1: Lesson 9.4 Close the Month: Statements, Lessons and Giving: warm-up, video, teaching and picture study • Session 2: Lesson 9.4 project and ledger notebook • Session 3: Unit 9 review and portfolio project

MATERIALS

Ledger notebook (a graph-paper composition book)

One for the whole year: tables, journals, ledgers, trial balances, budgets and stakeholder scorecards.

A calculator

One with a power key (x^y or $\wedge$) is helpful for compound interest in Unit 8, but a basic calculator works if you multiply step by step.

A free spreadsheet (Google Sheets or LibreOffice Calc), if you have a computer

Helpful in Units 2, 7, 8 and 9 for price indexes, ledgers and interest tables. Everything can also be done by hand. A parent sets up and supervises any online account.

A jar of mixed coins and some play money

For trading games, auctions, making change and the bank and market projects.

Store flyers, receipts and a few grocery-store visits with a parent

For the price index, the demand survey, unit prices and market research.

Index cards, sticky notes, markers, scissors, tape, paper and a ruler

For price tags, kanban cards, journal slips, signs and small production lines.

A kitchen timer or stopwatch

For the productivity, factory and production-line projects.

Three envelopes or jars labeled Give, Save and Spend

For Unit 8 and the bonus business.

Household supplies for small projects and the bonus business

Paper, card stock, simple baking or craft supplies, or garden seedlings, chosen with a parent.

Optional: one of the books or games listed in a unit

Never required. See the list in each unit.

GRADING

Grades come mostly from the projects and the ledger notebook, because business and money are learned by doing, measuring and recording. A project whose numbers did not turn out well but are honestly recorded and explained earns full credit.

PART	%
Projects (effort, careful measuring and counting, and the improve-it step)	40
Ledger notebook (dated pages, formulas and units shown, honest records)	20
Unit reviews	15
Portfolio projects	25

Scale: A 90–100, B 80–89, C 70–79, D 60–69. Below 60: redo the project or review with help.

- Grade the process, not just the result. Did the student predict, measure carefully, show the formula and the units, record honestly, explain the numbers and suggest an improvement?
- A ledger page earns full marks when it has a date, a title, labeled columns, correct totals and one sentence about what the numbers mean. A journal and ledger earn full marks when debits equal credits.
- On calculation questions in the unit reviews, give partial credit for a correct formula and method even when the arithmetic slips.
- Keep each unit's portfolio pages in one folder. They make a fine record of the year and the centerpiece of the family market day.

A NOTE TO PARENTS

You do not need to be an economist or an accountant to teach this course. Read the story together, watch the video, and then be the student's customer, supplier, banker or employer in the project. Ask "What would you give up?", "Who gains from this, and who pays?" and "How do you know? Show me the numbers." Those three questions are most of what a good business teacher does. When a formula appears, have the student teach it back to you with a number of his or her own.

The course tells history honestly. Great businesses are shown with their strengths and their failings, and the lessons on workers, owners and fair rules are taught as settled history: what problem a law or a custom fixed, how it worked and what it cost, along with rules that went wrong. Nothing in the course asks you or your child to take a side in present-day public debates.

Real money should always be handled with you nearby. When the student sells something, you are the partner who keeps the cash box, checks the change and makes sure no one is cheated. Above all, the course hopes to raise a young person who works heartily, deals honestly, keeps true accounts, saves wisely and gives cheerfully. *Fabricando fit faber*: by making, one becomes a maker.

UNIT 1

WORK, TRADE AND PRODUCTIVITY

Why can one farmer today feed many more people than a farmer two hundred years ago? Why are some countries and families richer than others? A large part of the answer is **productivity**: how much people can produce in an hour of work.

Productivity rises when people work with better tools and machines, which economists call **capital goods**, when they organize their work well, and when they **specialize** and trade. In this unit you will see Cyrus McCormick's reaping machine, Richard Arkwright's water-powered cotton mill, and David Ricardo's great discovery about why trade pays even when one side is better at everything.

You will also learn to measure productivity, to work out comparative advantage with real numbers, and to count both the gains and the costs of the first factories. Last, you will meet John Harrison, a Yorkshire carpenter who spent forty years building a clock that could find a ship's place at sea, and think about work as a **calling**: a way of serving God and neighbor with the skills you have been given.

PREREQUISITES

- Knows goods and services, scarcity and opportunity cost (Grade 5, Unit 1)
- Can multiply and divide decimals and find a simple average
- Can read a simple table and bar graph

MASTERY CHECKLIST

- ☐ I can explain what capital goods are and calculate productivity as output per hour.
- ☐ I can tell how Richard Arkwright's mill began the factory system, with its gains and its costs.
- ☐ I can work out opportunity costs and comparative advantage from a table and show how trade makes both sides better off.
- ☐ I can explain work as a calling, using John Harrison's story and Proverbs 22:29.
- ☐ I can explain why saving and investing in capital goods raises living standards over time.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **I, Pencil, by Leonard E. Read (1958)**: Free at the Library of Economics and Liberty. A short essay told by a pencil about the thousands of people, tools and trades it takes to make it. Read it aloud over two evenings with Lesson 1.3. Ages 10 and up.
- **The Way to Wealth, by Benjamin Franklin (1758)**: Free at Project Gutenberg. Franklin's best sayings about diligence and thrift, such as "Diligence is the mother of good luck." Read a page with Lesson 1.4 and copy three sayings into your ledger notebook. Ages 10 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 Capital Goods and Productivity: McCormick's Reaper	2 sessions of 50 minutes
1.2 Arkwright's Mill and the Factory System	2 sessions of 50 minutes
1.3 Comparative Advantage: Why Trade Pays, with Numbers	2 sessions of 50 minutes
1.4 Called to Work: John Harrison and the Longitude Clock	2 sessions of 50 minutes

UNIT 1 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. **8 pts**

Name the four factors of production and give one example of each from a bakery.

2. **8 pts**

A worker paints 12 fence boards in 3 hours with a brush. With a paint sprayer, she paints 30 boards in 3 hours. Find her productivity each way and the percent increase.

3. 8 pts

A jig takes 20 minutes to build and saves 30 seconds on every item you make. How many items must you make before the jig has paid for the time spent building it?

4. 8 pts

Why does building capital goods require saving? Use McCormick's reaper or a family example.

5. 8 pts

Name three things Richard Arkwright combined to create the factory system at Cromford.

6. 8 pts

Name two gains and two costs of the first factories.

7. 8 pts

Who were Jedediah Strutt and Samuel Need, and which of the six stakeholders were they?

8. 10 pts

In one hour, Maria can make 20 muffins or 4 scarves. Leo can make 12 muffins or 4 scarves. Find each person's opportunity cost of one scarf. Who has the comparative advantage in scarves? In muffins?

9. 8 pts

What is the difference between absolute advantage and comparative advantage?

10. 8 pts

A ship's clock reads 2:00 p.m. London time at the moment the sun is highest over the ship (local noon). How far east or west of London is the ship?

11. 8 pts

What was the longitude prize, and how is it an example of an incentive?

12. 10 pts

Short answer: What is a vocation? Explain, using John Harrison and Proverbs 22:29, why diligent work in an ordinary job can be a calling.

ANSWER KEY

1. Natural resources (land, water, the wheat grown on farms); labor (the bakers and cashier); capital goods (ovens, mixers, the shop building, delivery van); entrepreneurship (the owner who started the bakery and takes the risk).
2. Brush: $12 \div 3 = 4$ boards per hour. Sprayer: $30 \div 3 = 10$ boards per hour. Percent increase = $(10 - 4) \div 4 \times 100 = 150\%$.
3. 20 minutes = 1,200 seconds. $1,200 \div 30 = 40$ items.
4. To build or buy a capital good, people must give up some spending or some production for use today and put those resources into a tool that will produce more later. A farmer who bought a reaper gave up other purchases that year in order to harvest much more grain for many years.
5. Any three: central power from one water wheel; machines (the water frame) doing the work of many hands; the division of labor into steps; gathering workers in one building with set hours and supervision; housing workers nearby.
6. Gains (any two): cheap, strong thread and cloth for customers; higher productivity; new jobs; wealth for owners and partners. Costs (any two): long hours and strict rules; child labor; hand spinners lost their work; workers lost control of their own time.
7. They were hosiery makers who became Arkwright's partners and paid for his first mills. They were financiers (and also shared the risk as partners).
8. Maria: $20 \div 4 = 5$ muffins per scarf. Leo: $12 \div 4 = 3$ muffins per scarf. Leo gives up less, so Leo has the comparative advantage in scarves. Maria has the comparative advantage in muffins (her muffin costs $4 \div 20 = \frac{1}{5}$ scarf; Leo's costs $4 \div 12 = \frac{1}{3}$ scarf).
9. Absolute advantage means being able to produce more of something with the same time or resources. Comparative advantage means producing something at a lower opportunity cost. A person can have an absolute advantage in everything but a comparative advantage in only some things.
10. The ship is 2 hours behind London, so it is west. $2 \times 15 = 30$ degrees west of London.
11. In 1714 Parliament offered up to £20,000 for a practical way to find longitude at sea. The promise of a large reward encouraged many people, including John Harrison, to spend years working on the problem.

12. A vocation is the work God calls a person to do in serving others. Harrison was a carpenter and clockmaker, not a scholar, yet his patient, diligent work over forty years solved a problem that saved sailors' lives, and he "stood before" King George III. Any honest work done heartily and well for others can be a calling. (Accept any well-reasoned answer that uses both the story and the verse.)

PORTFOLIO PIECE: A PRODUCTIVITY REPORT ON A REAL JOB

Choose a real job done in your home, your church or a family business: washing dishes, mowing a lawn, folding bulletins, packing orders. Measure productivity the old way and with a better tool, method or division of labor, at least three trials each. Write a one-to-two-page report with four headings: The job, How I measured it (with a table and a bar graph), What changed productivity (capital, skill or specialization), and Was it worth it? (include the payback or the opportunity cost). End with one paragraph on how this job can be done as a calling, and one sentence of advice for the person who does it.

LOOK FOR	WHAT IT MEANS
Measurement	At least three trials of each method, with output, time and productivity in a labeled table and a bar graph.
Economic reasoning	Correctly uses capital goods, productivity and opportunity cost or payback to explain the results.
Honesty and accuracy	Counts only good output, records real numbers, and explains anything that went wrong.
Vocation	A thoughtful paragraph on doing this job heartily as service to God and others.

1.1 CAPITAL GOODS AND PRODUCTIVITY: MCCORMICK’S REAPER

OBJECTIVES

- Define capital goods and name the four factors of production.
- Calculate productivity as output per hour and compare it before and after a new tool.
- Tell how Cyrus McCormick’s reaper changed farm work, and explain why building capital means saving first.
- Work out how many uses it takes for a tool to pay back the time spent making it.

Warm-up. Look around your kitchen for five tools that make work faster (a can opener, a whisk, a toaster). For each one, guess how much longer the job would take without it. Which tool saves the most time? Which one would you buy first if you were starting a kitchen from nothing?

WATCH

Factors of Production | Economics Explained

Federal Reserve Bank of St. Louis • 5:40

<https://www.youtube.com/watch?v=8Xg9rRmskHg>

WHEN TO WATCH

After the story of the reaper, before the big idea. Pause when capital resources are explained and name three capital goods in your own home.

KEY TERMS

factors of production

The four kinds of resources used to produce goods and services: natural resources (land), labor, capital goods and entrepreneurship.

capital goods

Goods made by people and used to produce other goods and services, such as tools, machines, vehicles and buildings.

productivity

The amount of output produced per unit of input, usually per worker per hour. $\text{Productivity} = \text{output} \div \text{hours worked}$.

investment

In economics, spending on new capital goods today so that more can be produced in the future.

human capital

The knowledge, skill and good habits a worker has gained through education, training and practice.

CORE IDEAS

The story. For thousands of years, grain was cut by hand. A harvester bent over with a sickle, or swung a scythe fitted with a wooden “cradle” that caught the stalks so they could be laid in neat rows. Ripe wheat must be cut within a short time or the grain falls to the ground and is lost, so the size of a family’s farm was limited by how much its people could cut in those few weeks. On a Virginia farm called Walnut Grove, Robert McCormick worked for years on a horse-drawn reaping machine and could not make it work. In 1831 his son Cyrus, then twenty-two, built a new version and showed it in a neighbor’s field. A horse pulled it along, a moving blade cut the wheat, and a reel pushed the stalks onto a platform where a man raked them off. Cyrus patented the reaper in 1834.

How they figured it out. The first reapers often broke or clogged, and farmers were slow to trust them. Another inventor, Obed Hussey, patented a rival reaper in 1833, and the two men competed for years in field trials. McCormick kept changing his design after each trial. He also saw that his best customers were not on the small hilly farms of Virginia but on the wide, flat prairies of the Midwest, so in 1847 he built a factory in Chicago, where the railroads and the prairie farms met. Because a farmer could not easily pay for a machine before the harvest, McCormick let him pay part down and the rest later, after the grain was sold, and he offered a written guarantee. With a reaper, a farmer and a small crew could cut several times as much grain in a day as the same men could with cradles. Farms grew, fewer people were needed to bring in the harvest, and many of the rest went to work in towns making other things.

The big idea. Economists list four **factors of production**: natural resources, labor, **capital goods** and entrepreneurship. Capital goods are things people make in order to make other things: a reaper, a sewing machine, a delivery truck, a computer. **Productivity** is output per hour of work: $productivity = output \div hours$. If a worker cuts 2 acres in a 10-hour day by hand, his productivity is $2 \div 10 = 0.2$ acres per hour. If a machine lets him cut 10 acres in the same day, it is 1 acre per hour, five times as much. (These are round numbers for practice.) Productivity also rises with **human capital**, the skill and knowledge workers carry in their heads. Rising productivity is the main reason that living standards rise over time: when each hour of work produces more, each hour can be paid more.

Think it through. Capital goods are not free. To build a reaper, someone has to spend time and money making something that cannot be eaten or worn today. That means **saving**: giving up some spending now so that resources can go into **investment**, which in economics means new capital goods. A farmer who saved for a reaper ate a little less well one year and harvested far more for many years after. The same is true for a family, a business or a country.

In business today. Every business asks whether a new tool is worth what it costs. A bakery asks whether a bigger mixer will pay for itself in more loaves; a trucking company asks whether a new truck will carry enough loads. A wise owner counts the cost first, as Jesus said: “which of you, intending to build a tower, sitteth not down first, and counteth the cost” (Luke 14:28). And a wise worker keeps sharpening his own human capital, by learning, practicing and taking care of his tools.

PICTURE STUDY



A McCormick Reaper at Work, Unknown photographer, late 19th century · Photograph

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

This old photograph shows a horse-drawn McCormick reaper in a field of ripe grain, with a windmill on the horizon. Machines like this one changed farm work across America and Europe in the 1800s.

Look closely

- Find the cutting platform and the wooden frame of the reel. What does each part do to the grain?
- Count the people. What is each one doing?
- Find the horse. What is the source of power for this machine?
- Find the windmill. It is another kind of capital good. What might it be used for?

Talk about it

1. Which parts of this picture are capital goods, which are labor, and which are natural resources?
2. How many people would it take to cut this field by hand in the same time? How could you find out?
3. Why might a farmer have been afraid to buy this machine at first? What did McCormick do to help him decide?

PROJECT

Build a Tool and Measure Its Payback

You will measure your productivity at a simple job, build a small piece of capital (a jig or template) to help, measure again, and work out how many uses it takes for your tool to pay back the time you spent making it. This is the same question McCormick's customers asked.

You will need

- A stack of scrap paper or old envelopes, scissors, a ruler and a pencil
- Card stock or a cereal box for building a template
- A timer
- Ledger notebook and a calculator

Steps

1. Choose a job: cutting paper into bookmarks exactly 5 cm × 18 cm, measured with a ruler each time.
2. **Labor only.** Work for 5 minutes, measuring and cutting each bookmark with just a ruler and scissors. Count the good bookmarks (straight edges, correct size). Record the count and work out your productivity in bookmarks per minute.
3. **Build capital.** Time yourself making a cardboard template the exact size of a bookmark, with a straight edge to trace against. Record how many minutes it took to make.
4. **Labor plus capital.** Work another 5 minutes using the template. Count the good bookmarks and work out your new productivity.
5. Calculate the gain: $(\text{new productivity} - \text{old productivity}) \div \text{old productivity} \times 100 = \text{percent increase}$.
6. Calculate the payback. Find the time saved per bookmark (seconds per bookmark before minus seconds per bookmark after). Then divide the minutes spent building the template (changed to seconds) by the seconds saved per bookmark. That is how many bookmarks you must make before the template has paid for itself.

7. Make a bar graph comparing bookmarks per minute with and without the template.
8. Write a short paragraph: Was the template worth building? What would make it worth more (more bookmarks to make, a better design)? What did you have to give up to build it?

Tips

- Count only good bookmarks. A tool that makes you faster but sloppier has not really raised your productivity.
- If you have time, improve the template and test again, as McCormick improved his reaper after each field trial.

Check your work

- ☐ I can calculate productivity as output per minute or per hour.
- ☐ I can calculate the payback of a tool.
- ☐ I can explain why building capital means giving something up first.

LEDGER NOTEBOOK

1. Make a table of the four factors of production with three examples of each from a business in your town (a bakery, a farm, a repair shop).
2. Draw the McCormick reaper and label the cutting bar, the reel, the platform, the horse and the worker. Next to each label write whether it is labor, capital or a natural resource.
3. Record your productivity results in a table: Method, Good bookmarks, Minutes, Bookmarks per minute, Percent gain.
4. What I would change: one sentence on how you would improve your template next time.

From history. At the Great Exhibition in London in 1851, the McCormick reaper was tested in a wet English field and cut the grain cleanly, winning one of the exhibition's top medals. Many farmers in Britain and Europe ordered reapers after that, and McCormick's company later grew into one of the largest farm-machine makers in the world.

COMMON MISTAKES

- Thinking capital means only money. In economics, capital goods are the tools, machines and buildings that money can buy.

- Measuring speed and forgetting quality. Productivity counts good output, not just fast output.
- Forgetting the cost of a tool. A machine raises productivity only after it pays back the time and money spent on it.

Make it a game • Bean Harvest Payback. Scatter forty dry beans on a table. Move as many as you can into a bowl in thirty seconds by hand, then spend one minute making a tool, such as a scoop from paper, and harvest again. Calculate output per hour both times. How many rounds before the tool's payback beats your hand? Name the four factors of production.

Scripture. “If the iron be blunt, and he do not whet the edge, then must he put to more strength: but wisdom is profitable to direct.” (Ecclesiastes 10:10, KJV)

A dull axe takes more strength; a sharp one does more with less. Taking time to sharpen the tool, or to build a better one, is the wisdom behind every rise in productivity.

1.2 ARKWRIGHT'S MILL AND THE FACTORY SYSTEM

OBJECTIVES

- Tell how Richard Arkwright built the water frame and the Cromford mill, and who financed it.
- Explain the factory system: central power, machines, specialized workers and regular hours.
- Weigh the gains and the costs of the first factories, for owners, workers, customers and the community.
- Compare the productivity of making something by hand at home with making it in a small “factory.”

Warm-up. Look at the label on a cotton shirt or towel. Where was it made? Now imagine your family had to spin the thread and weave the cloth for every shirt you own, by hand. Guess how many hours one shirt would take. Write your guess down; you will come back to it.

WATCH

Discover more: Arkwright's Water Frame

Science and Industry Museum • 2:24

<https://www.youtube.com/watch?v=D-6nPEcdvhg>

WHEN TO WATCH

After the story, before “How they figured it out.” Watch the rollers closely.

Note: A curator at the Science and Industry Museum in Manchester shows one of Arkwright's original water frames.

KEY TERMS

water frame

Arkwright's spinning machine, patented in 1769, which used sets of rollers turning at different speeds to stretch cotton into strong thread. It was driven by a water wheel.

factory system

A way of producing in which many workers and machines are gathered in one building, driven by one source of power, and organized with set hours and supervisors.

cottage industry

Work done by families in their own homes with simple tools, such as spinning and weaving before the factories.

partner

A co-owner of a business who shares its risks and profits; some partners supply mostly money and others mostly work and skill.

patent

A government grant that gives an inventor the sole right to make and sell an invention for a set number of years.

CORE IDEAS

The story. Before about 1770, most English cloth was made in cottages. Families bought raw wool or cotton from a merchant, spun it into thread on a spinning wheel, wove it on a hand loom, and sold the cloth back. Spinning was the slow step: it took several spinners to keep one weaver busy. Richard Arkwright, born in 1732 in Preston, Lancashire, was a barber and wigmaker with no training as an engineer. But he was clever, stubborn and full of plans. With the help of a clockmaker named John Kay, he built a spinning machine in which pairs of rollers, each turning faster than the one before, stretched the cotton fibers thin before a spindle twisted them into thread. He patented it in 1769. Because it was later driven by a water wheel, it was called the **water frame**.

How they figured it out. Arkwright had an idea but no money. Two hosiery makers, Jedediah Strutt and Samuel Need, became his **partners** and paid for a first mill in Nottingham, turned by horses. Horses were costly and tired, so in 1771 the partners built a new mill at Cromford in Derbyshire, beside a stream that never froze because it was fed by warm water draining from old lead mines. One water wheel now drove many machines at once. Arkwright gathered workers into one building, divided the work into steps (cleaning, carding, spinning, reeling), set fixed hours rung by a bell, and kept the machines running in long shifts. He built rows of stone cottages for workers' families, a market and an inn, because Cromford was a small village and he needed people to come and stay. This was the **factory system**, and other owners copied it across Britain and, soon, in America.

Who gained? Arkwright and his partners grew very rich; he was knighted in 1786. Customers gained most of all: machine-spun thread was strong and cheap, and over

the following decades cotton cloth became so inexpensive that ordinary families could own several changes of clothes and cotton sheets. But the costs were real. The hours were long and the rules strict, with fines for lateness or carelessness. Many workers were children, some younger than ten, as was common on farms and in workshops of that time; this became one of the wrongs that the Factory Acts of the 1800s set out to fix (Unit 5). Hand spinners at home lost their work. And Arkwright guarded his patents fiercely until a court cancelled them in 1785, after rivals showed that some of his ideas had been invented by others.

The big idea. The factory system raised **productivity** by combining three things: central power (one water wheel or, later, one steam engine for many machines), capital goods (machines that did the work of many hands), and the **division of labor** (each worker doing one step well). It also changed work itself. In a **cottage industry**, a family worked when it chose; in a factory, the bell decided. Both the gains and the costs come from the same change.

In business today. Factories still use central power, specialized machines and organized steps, but most countries now have laws about hours, safety and children's schooling, learned from the hard lessons of the first mills. A good factory today is judged by its productivity and quality and also by how it treats its workers and its town.

PICTURE STUDY



Arkwright's Mills, Joseph Wright of Derby, about 1795–1796 · Oil on canvas · Derby Museum and Art Gallery, Derby, England

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

Joseph Wright lived in Derby, not far from Cromford, and painted Arkwright's mills more than once; one famous version shows them glowing by night with every window lit. In this daytime view, the great mill stands in a narrow green valley beside the River Derwent, a new kind of building in the old English countryside.

Look closely

- Find the mill. Count its floors and rows of windows. Why would a mill need so many windows?
- Find the river. Why did Arkwright build his mill here and not in a town?
- Look at the cliffs and woods around the mill. How does the building fit, or not fit, into the countryside?
- Look for any smaller buildings or houses near the mill. Who would have lived in them?

Talk about it

1. Does the painter make the mill look wonderful, frightening or both? What makes you think so?

2. A mill worker on a long shift and a customer buying cheap cotton cloth would see this mill differently. How might each describe it?
3. What would you need to see inside the mill to give it a fair score for its workers?

PROJECT

Cottage or Factory? A Paper-Fan Productivity Test

You will make paper fans first the “cottage” way, each person doing every step alone, and then the “factory” way, with a line of workers, each doing one step, and a simple tool. You will measure productivity, quality and how the work felt, and weigh the gains and the costs.

You will need

- A stack of plain paper, crayons or markers, tape or a stapler
- A ruler and a cardboard folding guide (a strip 2 cm wide)
- A timer and 2–4 helpers (family members)
- Ledger notebook and calculator

Steps

1. Agree on a fan design: decorate one side with a stripe, fold into 2 cm pleats, staple or tape the bottom. Agree on what counts as a good fan.
2. **Cottage round.** For 8 minutes, each person makes fans alone, doing every step. Count the good fans. $\text{Productivity} = \text{good fans} \div (\text{number of workers} \times \text{minutes})$.
3. **Factory round.** Set up a line: one person decorates, one folds using the cardboard guide (a capital good), one staples and checks quality. Ring a “bell” (clap) to start and stop. Work for 8 minutes and count the good fans. Work out productivity the same way.
4. Compare: by what percent did productivity change? Did quality change?
5. Ask each worker to rate the work from 1 (dull) to 5 (enjoyable) for each round, and give one reason.
6. Make a two-column table: Gains of the factory way, Costs of the factory way. Include the numbers and the ratings.
7. Write a paragraph: If you owned this “factory,” what rules would you set for hours, breaks and safety that would keep productivity high and treat your workers fairly?

Tips

- The first few minutes of a production line are often slow. If you have time, run a second factory round after fixing the slowest step.
- The ratings matter as much as the counts. The first factories were productive, and many workers still found the work hard and dull.

Check your work

- ☐ I can calculate productivity per worker per minute.
- ☐ I can name at least two gains and two costs of the factory system.
- ☐ I can explain why the factory system raised productivity.

LEDGER NOTEBOOK

1. Draw a simple diagram of the water frame: a water wheel, a shaft, and three pairs of rollers turning faster from left to right. Label how the cotton is stretched and twisted.
2. Make a timeline: 1732 Arkwright born; 1769 water frame patent; 1771 Cromford mill; 1785 patents cancelled; 1786 knighted; 1792 death.
3. Copy your gains-and-costs table and add one line: “The cottage spinner who lost her work could ...” and finish the sentence with ideas for what she might do next.
4. Go back to your warm-up guess about the hours to make a shirt by hand. Write how the factory changed that number for ordinary families.

From history. In 1789 a young man named Samuel Slater, who had worked as an apprentice to Jedediah Strutt, sailed to America with the design of Arkwright’s machines memorized, because Britain did not allow the plans or the machines to be taken abroad. In Pawtucket, Rhode Island, he helped build America’s first successful water-powered cotton-spinning mill, which began running in 1790.

COMMON MISTAKES

- Thinking Arkwright invented everything himself. He combined and improved ideas, some from other inventors, and his genius was mostly in organizing the factory.
- Thinking the factory was all good or all bad. It made cloth cheap for millions and also brought long hours, strict rules and child labor that later laws had to fix.
- Forgetting the financiers. Without Strutt and Need’s money, Arkwright’s idea might have stayed a model on a table.

Make it a game • Cromford Story Chain. Tell Richard Arkwright's story one sentence at a time, taking turns with your parent. Each sentence must use a word from this list: water frame, patent, partner, factory system, cottage industry. Play until you reach the mill and its regular hours. The first one who cannot continue the story loses a point. Replay faster.

Scripture. “In all labour there is profit: but the talk of the lips tendeth only to penury.” (Proverbs 14:23, KJV)

Arkwright was a man of many plans, but plans alone made nothing. Ideas become useful only when someone does the hard work of building, testing and running them.

1.3 COMPARATIVE ADVANTAGE: WHY TRADE PAYS, WITH NUMBERS

OBJECTIVES

- Tell how David Ricardo explained comparative advantage in 1817.
- Tell the difference between absolute advantage and comparative advantage.
- Calculate opportunity costs from a production table and decide who should specialize in what.
- Show with numbers how specializing and trading lets both sides have more.

Warm-up. You can rake leaves in 1 hour, and your older brother can do it in 30 minutes. He can also wash the car in 30 minutes, while it takes you 2 hours. He is faster at both. Should he do both jobs while you watch? Write down your answer and your reason before the lesson.

WATCH

Comparative advantage specialization and gains from trade | Microeconomics | Khan Academy

Khan Academy • 8:56

<https://www.youtube.com/watch?v=xx9xNJlPOJo>

WHEN TO WATCH

After the big idea, before the project. Pause after the opportunity costs are worked out and check them yourself.

Note: Khan Academy works a simple two-person example with plates and cups, using the same method as this lesson.

KEY TERMS

absolute advantage

The ability to produce more of something than someone else with the same time or resources.

comparative advantage

The ability to produce something at a lower opportunity cost than someone else.

opportunity cost

The value of the next-best thing you give up when you make a choice.

gains from trade

The extra goods both sides can have when each specializes in what it does at the lowest opportunity cost and then trades.

terms of trade

The rate at which one good is exchanged for another, for example $2\frac{1}{2}$ cookies for 1 bookmark.

CORE IDEAS

The story. David Ricardo was born in London in 1772, the son of a stockbroker, and went to work in his father's business at fourteen. He became a successful stockbroker himself. In 1799, while on holiday in the town of Bath, he picked up Adam Smith's *The Wealth of Nations* and was so interested that he began to study economics in his spare time. In 1817 he published a book on economics in which he asked a puzzling question: if one country can make everything more cheaply than another, is there any reason for the two to trade? His answer surprised many people, and it is still taught in every economics course.

How they figured it out. Ricardo saw that the key is not who is *best* at a thing, but who gives up the *least* to make it. Here is an example. In one hour, Anna can bake 30 cookies or make 10 bookmarks. Ben can bake 10 cookies or make 5 bookmarks. Anna is faster at both, so she has the **absolute advantage** in both. Now find the **opportunity costs**. For Anna, 1 bookmark costs $30 \div 10 = 3$ cookies she could have baked instead. For Ben, 1 bookmark costs $10 \div 5 = 2$ cookies. Ben gives up less to make a bookmark, so Ben has the **comparative advantage** in bookmarks. For Anna, 1 cookie costs $10 \div 30 = \frac{1}{3}$ of a bookmark; for Ben, 1 cookie costs $\frac{1}{2}$ a bookmark. Anna has the comparative advantage in cookies.

The big idea. Suppose each has 2 hours. If each splits the time evenly, Anna makes 30 cookies and 10 bookmarks, and Ben makes 10 cookies and 5 bookmarks: together, 40 cookies and 15 bookmarks. Now let each lean toward his or her comparative advantage. Ben spends both hours on bookmarks: 10 bookmarks. Anna spends $1\frac{1}{2}$ hours on cookies (45) and $\frac{1}{2}$ hour on bookmarks (5). Together: 45 cookies and 15 bookmarks. The same people, the same hours, and 5 more cookies, with no fewer

bookmarks. If they then trade at **terms of trade** between 2 and 3 cookies per bookmark, say $2\frac{1}{2}$, both can end up with more than they could have made alone. These are the **gains from trade**. Everyone has a comparative advantage in something, because everyone has a lowest opportunity cost somewhere.

Think it through. A famous example comes from baseball. As a young player for the Boston Red Sox, Babe Ruth was one of the best pitchers in the game. But he was an even more remarkable hitter, and a pitcher plays only every few days. When he moved to the outfield to hit every day, his team gave up a fine pitcher and gained the greatest hitter of his time. Being good at two things did not mean he should do both; it meant he should do the one where he gave up the least.

In business today. Comparative advantage explains why a skilled doctor hires an office manager even if the doctor could do the paperwork faster, why a farm family may buy its bread and sell its eggs, and why countries trade grain, machines and clothing with each other. It also explains why every honest kind of work is needed. God gives different gifts to different people (Romans 12:6), and trade lets each gift serve everyone.

PICTURE STUDY



The IJ before Amsterdam, with the Frigate De Ploeg, Ludolf Bakhuizen, 1708 · Oil on canvas · Rijksmuseum, Amsterdam

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

In the 1600s and 1700s Amsterdam was one of the busiest trading cities in the world. The Dutch had little land and few raw materials, but they became experts at shipbuilding, shipping, trading and finance. Ludolf Bakhuizen began as a merchant's clerk and taught himself to paint the ships he loved; he painted this view of the IJ, Amsterdam's harbor, in the last year of his life.

Look closely

- Count the large ships and the small boats. What different jobs might each kind do?
- Find the city on the horizon. What do you think the ships are bringing into it, and taking out?
- Look at the sky and the water. What risks did these traders face?

Talk about it

1. The Dutch had little farmland. How could they still eat well and grow rich? Use the words “comparative advantage” in your answer.
2. Why might a Dutch shipbuilder buy grain from the Baltic instead of growing it himself, even if he could?

3. Who gains when these ships come in safely? Name at least three kinds of people.

PROJECT

The Comparative-Advantage Workshop

You and a parent will measure how much each of you can make of two simple products in 5 minutes, work out your opportunity costs, decide who should specialize in what, and prove with numbers that you can make more together.

You will need

- Paper, scissors, markers and a stapler
- A timer and a parent or sibling as your trading partner
- Ledger notebook and calculator

Steps

1. Choose two simple products, for example paper chains (count the links) and folded paper boats.
2. **Measure.** Each person spends 5 minutes making only links and 5 minutes making only boats. Record the counts in a table: Person, Links in 5 min, Boats in 5 min.
3. **Opportunity costs.** For each person, work out how many links one boat costs ($\text{links} \div \text{boats}$) and how many boats one link costs ($\text{boats} \div \text{links}$).
4. Decide who has the absolute advantage in each product, and who has the comparative advantage in each. Write your reasoning.
5. **Round 1, no trade.** Each person spends 5 minutes on links and 5 on boats. Record the total of each product for the family.
6. **Round 2, specialize.** Each person spends all 10 minutes (or most of them) on the product of his or her comparative advantage. Record the totals.
7. Compare the two rounds. Did the family make more in total? How much more of each?
8. **Trade.** Agree on terms of trade between your two opportunity costs and swap so that each of you ends up with some of both. Show in a table that each of you has at least as much of both products as in Round 1, and more of at least one.

Tips

- If you and your partner turn out to have the same opportunity costs, there are no gains from specializing. Try a different pair of products.
- Write every division with its units: “12 links ÷ 3 boats = 4 links per boat.”

Check your work

- ☐ I can tell absolute advantage from comparative advantage.
- ☐ I can calculate opportunity costs from a table.
- ☐ I can show with numbers that specializing and trading gave us more.

LEDGER NOTEBOOK

1. Copy Anna and Ben’s table and work out all four opportunity costs yourself without looking.
2. Draw two simple bar graphs side by side: family totals with no trade and with specialization.
3. List three things your family buys instead of making, and for each, write what you would have to give up to make it yourself.
4. What I would change: one sentence about how you would set up the workshop differently next time.

From history. David Ricardo grew wealthy as a stockbroker and retired from business in his early forties to write and study. His friend James Mill urged him to publish his ideas, and Ricardo, who doubted his own writing, did so only after much encouragement. He died in 1823, at fifty-one, but his idea of comparative advantage is still one of the most important in all of economics.

COMMON MISTAKES

- Thinking the person who is best at something should always do it. What matters is the lowest opportunity cost, not the highest speed.
- Dividing the wrong way. The opportunity cost of one boat is links ÷ boats; the opportunity cost of one link is boats ÷ links.
- Thinking trade means one side wins and the other loses. Fair, willing trade at good terms makes both sides better off.

Make it a game • Trade Pays Test. Each of you times one minute of drawing stars and one minute of folding paper boats. Write the numbers and figure each person's opportunity cost of one boat. Who should specialize in what, as Ricardo explained? Trade for a final round and compare totals with the first try. Name the difference between absolute and comparative advantage.

1.4 CALLED TO WORK: JOHN HARRISON AND THE LONGITUDE CLOCK

OBJECTIVES

- Explain what a vocation, or calling, is, and why honest work of every kind can serve God and neighbor.
- Tell how John Harrison, a self-taught carpenter, spent forty years solving the longitude problem.
- Explain how a prize created an incentive, and why skill and diligence are a kind of capital.
- Test a homemade timekeeper the way Harrison tested his clocks, by measuring and recording its error.

Warm-up. Without looking at a clock, sit still and say “now” when you think exactly one minute has passed while a parent times you. Try three times and write down how many seconds off you were each time. How could a sailor on the open sea, without a good clock, know what time it was back home?

WATCH

The Longitude Problem

Cambridge University • 9:30

<https://www.youtube.com/watch?v=t61ZJuKPUoI>

WHEN TO WATCH

After the story of Harrison, before the big idea about calling.

Note: From the University of Cambridge, which keeps the papers of the Board of Longitude. Historians explain the problem and show some of the clocks and records.

KEY TERMS

vocation

A calling; the work God gives a person to do in serving others, from the Latin *vocare*, “to call.”

longitude

How far east or west a place is, measured in degrees from a starting line. A ship can find its longitude by comparing local time with the time at home: each hour of difference is 15 degrees.

chronometer

A clock or watch accurate enough to keep time at sea, used to find longitude.

incentive

A reward or penalty that encourages people to act in a certain way, such as a prize for solving a problem.

diligence

Steady, careful, hard work that does not give up.

CORE IDEAS

The story. In the 1700s, sailors could find how far north or south they were by measuring the height of the sun at noon. But they had no good way to find how far east or west they were, their **longitude**. Ships ran onto rocks they thought were far away, and voyages took longer and cost more lives and money than they should. In 1714 the British Parliament offered a prize of up to £20,000, a huge fortune, for a practical way to find longitude at sea. Most scientists expected the answer to come from the stars. John Harrison, born in 1693 in Yorkshire, was a carpenter’s son who had taught himself to build clocks, at first almost entirely of wood. He believed the answer was a clock so accurate that it could keep home time for months on a rolling, wet ship.

How they figured it out. The idea was simple. The sun is highest at noon wherever you are. If a sailor knows it is noon on the ship, and his clock says it is 3 o’clock at home in London, the ship is $3 \times 15 = 45$ degrees west of London. But ordinary clocks of that time gained or lost minutes a day, and a few minutes meant many miles. Harrison built his first sea clock, H1, by 1735 and tested it on a voyage to Lisbon. Not satisfied, he spent about twenty years on H2 and H3, inventing new parts to deal

with heat, cold and motion. Then he changed direction entirely and built H4, a large pocket watch about five inches across, finished in 1759. On a voyage to Jamaica in 1761–62, it lost only a few seconds over many weeks. The Board of Longitude still demanded more trials and more proof. In 1772, when Harrison was nearly eighty, King George III tested his last watch, H5, himself, and the next year Parliament awarded Harrison £8,750. He died in 1776.

The big idea. A **vocation** is a calling. The Reformers of the 1500s taught that God calls people not only to be ministers but to every honest kind of work: farming, building, keeping house, trading, making clocks. William Tyndale wrote in 1528 that, although washing dishes and preaching are different deeds, “as touching to please God,” there is no difference at all. Harrison’s work shows what a calling looks like: skill learned with patience, **diligence** that did not quit after failure, and a problem worth solving for the good of others. Scripture says: “Seest thou a man diligent in his business? he shall stand before kings” (Proverbs 22:29). Harrison, a village carpenter, did.

Think it through. The longitude prize is an example of an **incentive**: the promise of a reward drew many people to work on a hard problem. Harrison’s years of practice are also an example of **human capital**. Like a machine, skill takes years to build and then produces value for a long time. Captain James Cook carried a copy of Harrison’s H4 on his second voyage around the world (1772–1775) and called it his trusted friend.

In business today. Prizes and rewards still drive invention, from a business’s bonus for a good idea to large contests for solving medical or engineering problems. And every job, from stocking shelves to designing satellites, can be done as a calling: “whatsoever ye do, do it heartily, as to the Lord, and not unto men” (Colossians 3:23). The best workers are not only fast but faithful: they care about getting it right.

PICTURE STUDY



John Harrison, Thomas King, 1767 · Oil on canvas · Science Museum, London

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

This portrait was painted when Harrison was in his seventies, still fighting to have his life's work recognized. He chose to be painted with his inventions: behind him is his third sea clock, H3, and in his hand is a large watch, H4.

Look closely

- Find the large watch in Harrison's hand. How big is it compared with his hand?
- Find the clock mechanism behind him. What does it tell you about his work?
- Look at his face and clothes. Does he look like a rich gentleman, a scientist or a craftsman?
- Look for any tools or instruments in the picture.

Talk about it

1. Why do you think Harrison wanted to be painted with his clocks rather than with fine furniture or a horse?
2. Harrison worked on these clocks for about forty years. What would keep a person working that long on one problem?
3. How is this portrait like, or unlike, the portraits of merchants and bankers you have seen?

PROJECT

Build a Pendulum Timer and Run a Sea Trial

You will build a simple pendulum timer, adjust it until it keeps time as well as you can make it, and then run a “sea trial” the way Harrison’s clocks were tested, measuring and recording its error. You will see why accuracy took Harrison so many years.

You will need

- String, a small weight (a washer, a large nut or a key) and tape
- A doorframe, table edge or broom handle to hang it from
- A ruler and a phone, kitchen timer or clock with a second hand (the “reference clock”)
- Ledger notebook and calculator

Steps

1. Tie the weight to the string and hang it so it can swing freely. A pendulum about 25 cm long swings back and forth about once each second.
2. Swing the pendulum gently and count 60 single swings (one side to the other) while a parent times you with the reference clock. Record the time.
3. Adjust the length: if 60 swings took longer than 60 seconds, shorten the string; if less, lengthen it. Test again. Record each length and time in a table.
4. When you have your best length, run a **sea trial**: count 300 swings (5 minutes by your pendulum) while a parent times it. Record the error in seconds.
5. Now “roll the ship”: have someone gently bump the table or support while you count another 300 swings. Record the error again.
6. Calculate your pendulum’s error per hour (error in 5 minutes $\times$ 12). Then use the rule that every 4 minutes of clock error means 1 degree of longitude, and work out how many degrees off a sailor using your timer would be after one day.
7. Write a paragraph: What made your timer less accurate? What would you change if you were Harrison? Why do you think he kept going for forty years?

Tips

- Swing the pendulum only a little way to each side. Big swings make the timing less steady.
- Count out loud with a partner checking you. A miscount is an error too.

Check your work

- ☐ I can explain how a clock helps a ship find its longitude.
- ☐ I measured and recorded my timer's error in a table.
- ☐ I can explain what a vocation is and give an example from Harrison's life.

LEDGER NOTEBOOK

1. Draw a globe with lines of longitude every 15 degrees and label them with the hours: 1 hour = 15 degrees.
2. Make a timeline of Harrison's life and clocks: 1693 born; 1714 Longitude Act; 1735 H1; H2 and H3; 1759 H4; 1761–62 Jamaica voyage; 1772 the King tests H5; 1773 award; 1776 death.
3. Interview someone who is skilled at his or her work (a mechanic, a nurse, a cook, a farmer). Ask: How long did it take to learn? What do you do to get better? How does your work help other people? Write the answers.
4. Write three of the “whatsoever ye do” jobs in your own house and how each one serves someone.

From history. Harrison's first three sea clocks are large brass machines that look nothing like a watch. All four of his first timekeepers, H1 to H4, survive and are kept at the Royal Observatory in Greenwich, London, where H1, H2 and H3 still run.

COMMON MISTAKES

- Thinking only some jobs are a real calling. Every honest job, done heartily, serves God and neighbor.
- Thinking the problem was knowing the time on the ship. Sailors could find local noon from the sun; the hard part was knowing the time back home.
- Thinking Harrison's success came quickly. It came after decades of failures, trials and improvements.

Make it a game • Pendulum Sea Trial. Tie a washer to a string and hang it from a doorknob. Count swings in thirty seconds, then shorten the string and count again. Aim for a steady tick like Harrison's clock. Beat your own consistency across three trials. Then say why longitude needed a clock, and what diligence John Harrison showed over forty years.

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)

A Yorkshire carpenter’s son with no university training stood before a king because he was faithful and diligent in his work for forty years. Skill and diligence are gifts we can offer in every calling.

UNIT 1

WORK, TRADE AND PRODUCTIVITY

Why can one farmer today feed many more people than a farmer two hundred years ago? Why are some countries and families richer than others? A large part of the answer is **productivity**: how much people can produce in an hour of work.

Productivity rises when people work with better tools and machines, which economists call **capital goods**, when they organize their work well, and when they **specialize** and trade. In this unit you will see Cyrus McCormick's reaping machine, Richard Arkwright's water-powered cotton mill, and David Ricardo's great discovery about why trade pays even when one side is better at everything.

You will also learn to measure productivity, to work out comparative advantage with real numbers, and to count both the gains and the costs of the first factories. Last, you will meet John Harrison, a Yorkshire carpenter who spent forty years building a clock that could find a ship's place at sea, and think about work as a **calling**: a way of serving God and neighbor with the skills you have been given.

PREREQUISITES

- Knows goods and services, scarcity and opportunity cost (Grade 5, Unit 1)
- Can multiply and divide decimals and find a simple average
- Can read a simple table and bar graph

MASTERY CHECKLIST

- ☐ I can explain what capital goods are and calculate productivity as output per hour.
- ☐ I can tell how Richard Arkwright's mill began the factory system, with its gains and its costs.
- ☐ I can work out opportunity costs and comparative advantage from a table and show how trade makes both sides better off.
- ☐ I can explain work as a calling, using John Harrison's story and Proverbs 22:29.
- ☐ I can explain why saving and investing in capital goods raises living standards over time.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **I, Pencil, by Leonard E. Read (1958)**: Free at the Library of Economics and Liberty. A short essay told by a pencil about the thousands of people, tools and trades it takes to make it. Read it aloud over two evenings with Lesson 1.3. Ages 10 and up.
- **The Way to Wealth, by Benjamin Franklin (1758)**: Free at Project Gutenberg. Franklin's best sayings about diligence and thrift, such as "Diligence is the mother of good luck." Read a page with Lesson 1.4 and copy three sayings into your ledger notebook. Ages 10 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 Capital Goods and Productivity: McCormick's Reaper	2 sessions of 50 minutes
1.2 Arkwright's Mill and the Factory System	2 sessions of 50 minutes
1.3 Comparative Advantage: Why Trade Pays, with Numbers	2 sessions of 50 minutes
1.4 Called to Work: John Harrison and the Longitude Clock	2 sessions of 50 minutes

UNIT 1 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. **8 pts**

Name the four factors of production and give one example of each from a bakery.

2. **8 pts**

A worker paints 12 fence boards in 3 hours with a brush. With a paint sprayer, she paints 30 boards in 3 hours. Find her productivity each way and the percent increase.

3. (8 pts)

A jig takes 20 minutes to build and saves 30 seconds on every item you make. How many items must you make before the jig has paid for the time spent building it?

4. (8 pts)

Why does building capital goods require saving? Use McCormick's reaper or a family example.

5. (8 pts)

Name three things Richard Arkwright combined to create the factory system at Cromford.

6. (8 pts)

Name two gains and two costs of the first factories.

7. (8 pts)

Who were Jedediah Strutt and Samuel Need, and which of the six stakeholders were they?

8. (10 pts)

In one hour, Maria can make 20 muffins or 4 scarves. Leo can make 12 muffins or 4 scarves. Find each person's opportunity cost of one scarf. Who has the comparative advantage in scarves? In muffins?

9. (8 pts)

What is the difference between absolute advantage and comparative advantage?

10. (8 pts)

A ship's clock reads 2:00 p.m. London time at the moment the sun is highest over the ship (local noon). How far east or west of London is the ship?

11. (8 pts)

What was the longitude prize, and how is it an example of an incentive?

12. (10 pts)

Short answer: What is a vocation? Explain, using John Harrison and Proverbs 22:29, why diligent work in an ordinary job can be a calling.

ANSWER KEY

1. Natural resources (land, water, the wheat grown on farms); labor (the bakers and cashier); capital goods (ovens, mixers, the shop building, delivery van); entrepreneurship (the owner who started the bakery and takes the risk).
2. Brush: $12 \div 3 = 4$ boards per hour. Sprayer: $30 \div 3 = 10$ boards per hour. Percent increase = $(10 - 4) \div 4 \times 100 = 150\%$.
3. 20 minutes = 1,200 seconds. $1,200 \div 30 = 40$ items.
4. To build or buy a capital good, people must give up some spending or some production for use today and put those resources into a tool that will produce more later. A farmer who bought a reaper gave up other purchases that year in order to harvest much more grain for many years.
5. Any three: central power from one water wheel; machines (the water frame) doing the work of many hands; the division of labor into steps; gathering workers in one building with set hours and supervision; housing workers nearby.
6. Gains (any two): cheap, strong thread and cloth for customers; higher productivity; new jobs; wealth for owners and partners. Costs (any two): long hours and strict rules; child labor; hand spinners lost their work; workers lost control of their own time.
7. They were hosiery makers who became Arkwright's partners and paid for his first mills. They were financiers (and also shared the risk as partners).
8. Maria: $20 \div 4 = 5$ muffins per scarf. Leo: $12 \div 4 = 3$ muffins per scarf. Leo gives up less, so Leo has the comparative advantage in scarves. Maria has the comparative advantage in muffins (her muffin costs $4 \div 20 = \frac{1}{5}$ scarf; Leo's costs $4 \div 12 = \frac{1}{3}$ scarf).
9. Absolute advantage means being able to produce more of something with the same time or resources. Comparative advantage means producing something at a lower opportunity cost. A person can have an absolute advantage in everything but a comparative advantage in only some things.
10. The ship is 2 hours behind London, so it is west. $2 \times 15 = 30$ degrees west of London.
11. In 1714 Parliament offered up to £20,000 for a practical way to find longitude at sea. The promise of a large reward encouraged many people, including John Harrison, to spend years working on the problem.

12. A vocation is the work God calls a person to do in serving others. Harrison was a carpenter and clockmaker, not a scholar, yet his patient, diligent work over forty years solved a problem that saved sailors' lives, and he "stood before" King George III. Any honest work done heartily and well for others can be a calling. (Accept any well-reasoned answer that uses both the story and the verse.)

PORTFOLIO PIECE: A PRODUCTIVITY REPORT ON A REAL JOB

Choose a real job done in your home, your church or a family business: washing dishes, mowing a lawn, folding bulletins, packing orders. Measure productivity the old way and with a better tool, method or division of labor, at least three trials each. Write a one-to-two-page report with four headings: The job, How I measured it (with a table and a bar graph), What changed productivity (capital, skill or specialization), and Was it worth it? (include the payback or the opportunity cost). End with one paragraph on how this job can be done as a calling, and one sentence of advice for the person who does it.

LOOK FOR	WHAT IT MEANS
Measurement	At least three trials of each method, with output, time and productivity in a labeled table and a bar graph.
Economic reasoning	Correctly uses capital goods, productivity and opportunity cost or payback to explain the results.
Honesty and accuracy	Counts only good output, records real numbers, and explains anything that went wrong.
Vocation	A thoughtful paragraph on doing this job heartily as service to God and others.

UNIT 2

THE STORY OF MONEY

Money is one of the most useful inventions in history, but it is also one of the most misunderstood. In this unit you will learn the **three jobs** that anything must do to work as money, and test them on the great stone wheels of the island of Yap. Then you will follow the river of Spanish silver that poured out of the mountain of Potosí in the 1500s, became the world's first global coin, the piece of eight, and caused prices across Europe to climb for a hundred years.

You will also learn what a **central bank** is and why the Bank of England (1694) and the Federal Reserve (1913) were founded, and you will measure **inflation** the way economists do, with a price index and the percent-change formula. By the end you should be able to explain, with numbers, why printing more money does not make a country richer, and why honest money is a matter of justice: “Divers weights, and divers measures, both of them are alike abomination to the LORD” (Proverbs 20:10).

PREREQUISITES

- Knows barter, commodity money, the first coins and the gold standard (Grade 5, Unit 2)
- Can calculate a percent and a percent change
- Can multiply and divide decimals with a calculator

MASTERY CHECKLIST

- ☐ I can name and explain money's three jobs and the qualities of good money, using the stones of Yap.
- ☐ I can tell how Spanish silver from Potosí became the first global money, and explain why more silver made prices rise.
- ☐ I can explain what a central bank does, and tell why the Bank of England and the Federal Reserve were founded.
- ☐ I can build a simple price index and calculate an inflation rate with the percent-change formula.
- ☐ I can explain why printing more money does not make a country richer.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Federal Reserve History**: Free. Short, reliable essays and pictures on the founding of the Fed, the Panic of 1907, the gold standard and the history of American money. Good for Lesson 2.3 and the portfolio. Ages 11 and up with a parent.
- **Bank of England Museum**: Free. The museum's website has pictures and short articles on the founding of the Bank in 1694, early banknotes and the gold vaults. Fits Lesson 2.3.
- **Econ Lowdown (Federal Reserve Bank of St. Louis)**: Free lessons, videos and games on money, inflation and banking from the St. Louis Fed. A parent can set up a free account; many videos are also on the St. Louis Fed's YouTube channel.

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 Money's Three Jobs: The Stones of Yap	2 sessions of 50 minutes
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2.2 Spanish Silver and the Great Price Rise	2 sessions of 50 minutes
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2.3 Central Banks: The Bank of England and the Federal Reserve

2 sessions of 50 minutes

2.4 Measuring Inflation: The Price Index, with Numbers	2 sessions of 50 minutes
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UNIT 2 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. **8 pts**

Name money's three jobs and give an example of each.

2. **8 pts**

The stone at the bottom of the sea on Yap still counted as money. What does this show about what makes something money?

3. (8 pts)

Rate dried beans as money on two qualities of good money it has and two it lacks. Explain.

4. (8 pts)

Where was the great silver mountain of Potosí, and what was the Spanish coin made from its silver called?

5. (10 pts)

An island has 50 baskets of fish and 50 coins, and all the coins are spent on fish. A ship brings 100 more coins but no more fish. What price per basket would you expect, and what is the percent change?

6. (8 pts)

How did the Spanish dollar shape American money?

7. (8 pts)

Why was the Bank of England founded in 1694, and why was the Federal Reserve founded in 1913?

8. (8 pts)

A bank has \$5,000 in deposits and keeps \$400 in cash. What is its reserve ratio? Can it pay \$600 in withdrawals in one day without help?

9. (8 pts)

What does a lender of last resort do, and why does it help stop a bank run?

10. (10 pts)

A basket of goods cost \$80.00 in the base year and \$86.00 this year. Find the price index. If next year the basket costs \$88.58, what is next year's inflation rate?

11. (6 pts)

Use the rule of 70 to estimate how long it takes prices to double at 5% inflation a year.

12. (10 pts)

Short answer: Explain why printing more money does not make a country richer. Use Weimar Germany or Zimbabwe as an example.

ANSWER KEY

1. Medium of exchange (paying for groceries with dollars); unit of account (a price tag of \$3.49, or a record of a debt in dollars); store of value (saving \$20 to spend next month).
2. Money works because people agree on who owns it and trust that it will be accepted. It is a system of shared records and trust, not just a valuable object.
3. Has (any two): divisible, fairly uniform, portable in small amounts. Lacks (any two): durability over a long time (can spoil or get eaten), limited supply (anyone can grow more), acceptance by stores.
4. In the Andes mountains of what is now Bolivia; the coin was the peso de a ocho, the piece of eight (Spanish dollar).
5. Before: $50 \text{ coins} \div 50 \text{ baskets} = 1 \text{ coin per basket}$. After: $150 \text{ coins} \div 50 \text{ baskets} = 3 \text{ coins per basket}$. Percent change = $(3 - 1) \div 1 \times 100 = 200\%$.
6. Colonists used Spanish dollars widely, so the U.S. dollar created in 1792 was based on it; Spanish coins stayed legal tender in the U.S. until 1857, and “two bits” for a quarter comes from cutting a piece of eight into eight bits.
7. The Bank of England was founded when merchants lent £1,200,000 to King William III’s government for a war, in return for interest and a charter to form a bank. The Federal Reserve was founded after the Panic of 1907 showed that the U.S. needed a lender of last resort and a sounder banking system.
8. Reserve ratio = $400 \div 5,000 = 0.08 = 8\%$. No; it has only \$400 on hand and would need \$200 more, from borrowing or calling in loans.
9. It lends to sound banks during a panic, against good security. Depositors can be paid, fear calms down, and healthy banks do not fail just because too many people asked for cash at once.
10. Index = $86 \div 80 \times 100 = 107.5$. Next year’s index = $88.58 \div 80 \times 100 \approx 110.7$. Inflation = $(110.7 - 107.5) \div 107.5 \times 100 \approx 3\%$ (or $(88.58 - 86) \div 86 \times 100 = 3\%$).
11. $70 \div 5 =$ about 14 years.
12. A country’s wealth is the goods and services it produces. Printing more money without producing more goods only means more money chasing the same goods, so prices rise and each unit of money buys less. In Germany in 1923, printing marks to pay bills made prices double every few days and wiped out savings; in Zimbabwe in 2008 the same thing happened. (Accept any clear, accurate explanation with an example.)

PORTFOLIO PIECE: A MONEY TIMELINE AND PRICE INDEX REPORT

Make a two-part report. Part 1: an illustrated timeline of money from the stones of Yap and the piece of eight to the Bank of England, the Federal Reserve and today's dollar, with at least eight dated events and one sentence for each saying which of money's three jobs it helped or harmed. Part 2: your family price index from Lesson 2.4, extended with a second check of prices four weeks later. Include your table, your index and percent-change calculations, a line graph, and a paragraph explaining what you found and what a family can do to protect its savings from inflation.

LOOK FOR	WHAT IT MEANS
Accuracy	Dates, names and events on the timeline are correct and match the lessons or reliable sources.
Calculations	The price index and percent changes are correct, with formulas, units and labeled tables.
Understanding	Clearly explains money's three jobs, the role of a central bank and why too much money causes inflation.
Presentation	A neat timeline with pictures or drawings, a clear graph and complete sentences.

2.1 MONEY'S THREE JOBS: THE STONES OF YAP

OBJECTIVES

- Name and explain money's three jobs: medium of exchange, unit of account and store of value.
- List the qualities of good money and rate several kinds of money against them.
- Tell the story of Yap's stone money and explain why a stone at the bottom of the sea could still be money.
- Explain why money rests on trust.

Warm-up. Empty your pockets or a drawer and list everything that someone might accept as payment: coins, a gift card, stickers, a library card, a candy bar. Which items would a store accept? Which would a friend accept? Why the difference?

WATCH

Functions of money | Financial sector | AP Macroeconomics | Khan Academy

Khan Academy • 6:10

<https://www.youtube.com/watch?v=ok2vtKnSZzY>

WHEN TO WATCH

After the story of Yap, before the big idea. Write each of the three jobs in your notebook as it is explained.

BACKUP VIDEO

Money: An Economist's Perspective - The Curious Case of the Yap Stones (Part 4)

Atlanta Fed • 7:39

<https://www.youtube.com/watch?v=VbqW3A3PsXo>

With the story of Yap, if you would like an economist from the Federal Reserve Bank of Atlanta to tell it.

KEY TERMS

medium of exchange

Something people accept in trade for goods and services, so that they do not have to barter.

unit of account

A common measure of value, so that prices, debts and accounts can all be written in the same units, such as dollars.

store of value

Something that keeps its value over time, so that it can be saved and spent later.

liquidity

How quickly and easily something can be used to buy things without losing value. Cash is very liquid; a house is not.

ledger

A record of who owns what and who owes what. Money can work as entries in a ledger as well as coins in a hand.

CORE IDEAS

The story. Yap is a group of small islands in the western Pacific Ocean. Long ago, Yapese men sailed some 250 miles to the island of Palau, where they found a kind of limestone that did not exist on Yap. They carved it into great stone wheels, some as tall as a man and a few much larger, with a hole in the center for a pole, and brought them home on rafts and canoes at terrible risk. These stones, called *rai*, became money. They were used for large payments: a dowry, a piece of land, a canoe, a peace settlement. But the biggest stones were far too heavy to move. So when a stone changed owners, it usually stayed right where it was. Everyone in the village simply knew and remembered that it now belonged to someone else.

How they figured it out. An American visitor, William Furness, lived on Yap around 1903 and wrote down a remarkable story. A family's ancestors had once quarried an enormous stone, but on the voyage home a storm forced the crew to cut it loose, and it sank. When the men came home, they all agreed that the stone was of fine size and quality and that its loss was not the owners' fault. So the islanders went on counting the family as rich, as if the stone were in their yard. A stone no one had seen for generations, lying at the bottom of the sea, could still be spent. What made it money

was not where it sat, but that everyone agreed on who owned it. Later, when traders with iron tools and a large ship began bringing stones from Palau the easy way, the Yapese valued those stones less than the old ones that had cost so much danger and work.

The big idea. Anything that does three jobs well can serve as money. It is a **medium of exchange**: people accept it in trade. It is a **unit of account**: prices, debts and records are written in it. And it is a **store of value**: it keeps its worth so you can save it. Good money is also durable (it does not rot or wear out), portable (easy to carry), divisible (can be broken into small amounts), uniform (each unit is like every other), limited in supply (no one can make more at will) and widely accepted. Yap's stones were superb on durability, limited supply and acceptance, but poor on portability and divisibility, which is why ordinary buying and selling on Yap was done in other ways. Most of all, the story shows that money is a kind of shared **ledger** resting on trust.

In business today. Most of the money in a modern country is not coins or bills but numbers in bank ledgers, moved by checks, cards and electronic payments, much like a Yap stone changing owners without moving. That system works only as long as people trust the records and the institutions that keep them. That is why honest bookkeeping, safe banks and money that keeps its value matter so much. A dollar is useful to you because you trust that the grocer, the landlord and the tax collector will all take it tomorrow.

PICTURE STUDY



Stone Money at a Community House on Yap, National Oceanic and Atmospheric Administration (U.S. government photograph), modern photograph · Photograph · Yap, Federated States of Micronesia

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

This photograph, taken by a United States government agency, shows a traditional community house on Yap with several *rai* stones standing in front of it. Stones like these are still kept in villages on Yap and are still given in important ceremonies.

Look closely

- Count the stones. Are they all the same size? Find the hole in the center of each.
- Compare the stones with the building and the trees. How heavy do you think the largest one is?
- Look at where the stones are placed. Why might a village keep them near its community house?

Talk about it

1. Which of money's three jobs do these stones do well, and which do they do poorly?
2. If a stone changes owners but does not move, how does everyone know who owns it? What is the modern version of that?
3. Would you rather be paid in a Yap stone or in dollars? Give two reasons.

PROJECT

The Money Test Lab and the Village Ledger

You will test five possible kinds of money against the qualities of good money, then run a family “Yap village” in which one big stone changes owners several times without moving, recorded only in a shared ledger.

You will need

- Five money candidates: a cup of dried beans, a stack of index cards, a handful of buttons, a few real coins and a large rock or heavy book (your “rai stone”)
- Ledger notebook, pencil and ruler
- Three or four family members as villagers

Steps

1. Make a table with your five money candidates down the side and these qualities across the top: Durable, Portable, Divisible, Uniform, Limited supply, Accepted.
2. Test each one. Drop it, pour it, try to split it in half, see whether every unit is alike, and ask whether anyone could easily make more of it. Rate each quality from 1 (poor) to 5 (excellent) and add a reason.
3. Add up each candidate’s score. Which made the best money? Which job (medium of exchange, unit of account, store of value) did each do best?
4. **The village ledger.** Put the “rai stone” in a corner of the room and give it a value of 100 beans. Write in a shared ledger: Date, Stone, From, To, What was given in return.
5. Run five trades. Each time the stone is “sold,” it does not move. The buyer and seller announce the trade to the village, and the village keeper writes it in the ledger.
6. At the end, ask each villager: Who owns the stone now? How do you know? What would happen if the ledger were lost or someone changed it?
7. Write a paragraph: How is your bank account like a Yap stone? What keeps both of them honest?

Tips

- Be strict about “limited supply.” If anyone in the house can make more of a thing in a minute, it will not keep its value as money.
- Choose an honest ledger keeper and have a second person check every entry, just as banks and auditors do.

Check your work

- ☐ I can name money’s three jobs and the six qualities of good money.
- ☐ I rated five money candidates with reasons for each rating.
- ☐ I can explain why money rests on trust and on honest records.

LEDGER NOTEBOOK

1. Draw a rai stone next to a person for scale. Label which qualities of good money it has and which it lacks.
2. Copy your money-test table and circle the winning candidate.
3. Make a three-column chart: Medium of exchange, Unit of account, Store of value. Under each, write one example from your own family’s week.
4. Write the story of the stone at the bottom of the sea in five sentences, in your own words.

From history. William Henry Furness III, an American doctor and traveler, published his account of Yap in 1910 under the title *The Island of Stone Money*. Many economists since then have used his story of the stone at the bottom of the sea to explain that money is, at heart, a system of trust and records.

COMMON MISTAKES

- Thinking money must be made of something valuable. Money works because people trust and accept it; the stone at the bottom of the sea proves it.
- Mixing up the unit of account and the medium of exchange. A price tag in dollars uses money as a unit of account; handing over the dollars uses it as a medium of exchange.
- Thinking a store of value never changes. Even good money can lose value over time if too much of it is made (Lesson 2.4).

Make it a game • Is It Good Money. Gather five objects, such as a coin, a bean, a stone, a button and a paper slip. Score each from zero to five on durable, portable, divisible, scarce and uniform. Rank the best money. Then explain the three jobs of money and why a huge Yap stone was hard to spend but easy to record in a ledger.

2.2 SPANISH SILVER AND THE GREAT PRICE RISE

OBJECTIVES

- Tell how silver from Potosí and Mexico became the Spanish dollar, the first coin used around the world.
- Explain why a flood of new silver made prices rise across Europe in the 1500s.
- Use a simple model to show that more money with the same amount of goods leads to higher prices.
- Explain how the Spanish dollar shaped the American dollar.

Warm-up. Imagine everyone in your town found tomorrow morning that they had twice as many dollars in their wallets, but the stores had exactly the same goods on their shelves. What do you think would happen to prices by the end of the week? Write your prediction and your reason.

WATCH

Potosi: The Silver Mine that Changed the World

The History Guy: History Deserves to Be Remembered · 13:43

<https://www.youtube.com/watch?v=5BebknA0PeU>

WHEN TO WATCH

After the story, before “How they figured it out.”

Note: The History Guy speaks plainly about the harsh forced labor in the mines and the deaths it caused; watch with a parent. Stop when the teaching ends; the channel may close with a sponsor message.

BACKUP VIDEO

A Short History Of The Spanish Dollar: How It Impacted The World | Digging History '76

Digging History '76 · 11:57

<https://www.youtube.com/watch?v=VKpkh0TMDGs>

After the lesson, to see real pieces of eight and how they spread around the world.

KEY TERMS

piece of eight

The Spanish silver dollar, worth eight reales. It was so trusted that it was used for trade on every continent from the 1500s to the 1800s.

mint

A place where coins are made under the authority of a government.

money supply

The total amount of money in an economy.

inflation

A general rise in prices over time, which means each unit of money buys less.

default

Failing to pay back a debt as promised.

CORE IDEAS

The story. In 1545, in the high Andes mountains of what is now Bolivia, Spanish settlers learned of a mountain rich in silver. They named it the Cerro Rico, the “rich hill,” and the mining town of Potosí grew beneath it until it was one of the largest cities in the world. A year later, more great silver mines were found at Zacatecas in Mexico. Much of the digging at Potosí was done by Andean villagers forced to work in the mines under a harsh labor draft, a grave injustice and a heavy cost of this wealth. The silver was refined, cast into bars or struck into coins at the mints of Potosí and Mexico City, and shipped to Spain in guarded fleets, and across the Pacific to Manila in the Philippines on the Manila galleons, which sailed from 1565.

How they figured it out. The Spanish silver coin was the *peso de a ocho*, the “piece of eight,” worth eight smaller coins called reales. Because its weight and purity were carefully kept, merchants everywhere trusted it. Historians estimate that more than 16,000 tons of silver reached Spain officially between the early 1500s and the mid-1600s, and much more went by other routes. Spain used it to pay for wars and imports, so it flowed on to Italy, the Netherlands, England, the Ottoman Empire, India and, above all, China, where silver was in great demand. Then Europeans noticed something strange: the prices of bread, cloth and land kept rising, decade after decade. In 1556 a Spanish priest and scholar of the University of Salamanca, Martín de Azpilcueta, observed that money was worth less where it was plentiful, as

in Spain after the silver came, than where it was scarce. In 1568 the French writer Jean Bodin argued the same: the main cause of rising prices was the great flood of gold and silver from America.

The big idea. Money is valuable partly because it is scarce. Here is a simple model. An island has 100 loaves of bread and 100 silver coins, and all the coins are spent on bread, so a loaf costs 1 coin. A ship brings 100 more coins, but no more bread. Now 200 coins chase 100 loaves, and the price climbs toward 2 coins a loaf. The percent change is $(2 - 1) \div 1 \times 100 = 100\%$. The island is not richer, because it has no more bread; it simply has more coins, each worth less. This is **inflation**: when the **money supply** grows faster than the goods and services people produce, prices rise. In the 1500s prices in Spain rose several times over, and the rise spread across Europe.

Who gained? Spain's rulers seemed rich, but they spent the silver as fast as it came, borrowed more against future fleets, and still could not pay their debts. King Philip II's government **defaulted** on its loans several times, beginning in 1557. Meanwhile, merchants and producers in other countries who sold goods to Spain grew stronger. Silver was a real good, but it was not the same as wealth; wealth is the bread, cloth, ships and skills that money buys.

In business today. The piece of eight shaped American money. Colonists used Spanish dollars so widely that when Congress created the United States dollar in 1792, it was set close to the weight of silver in the Spanish dollar, and Spanish coins stayed legal tender in the United States until 1857. Merchants sometimes cut a piece of eight into eight "bits," which is why a quarter dollar is still sometimes called "two bits." And the lesson of the price rise still holds: a country grows richer by producing more, not by having more money.

PICTURE STUDY



A Spanish Silver Dollar (Piece of Eight), Mexico City Mint, 1796, Mexico City Mint (coin); modern photograph, 1796 · Silver coin

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

This silver dollar was struck at the mint in Mexico City in 1796, in the reign of King Charles IV of Spain. Coins like this one were carried in the pockets of American colonists, in the chests of Chinese merchants and in the cargo of ships on every ocean. On the other side, not shown here, is the royal shield between two pillars.

Look closely

- Find the king's portrait, his name (CAROLUS IIII, Latin for Charles IV) and the date. Why would a ruler put his face on a coin?
- Find the small marks punched into the coin's face. Merchants in China stamped such "chop marks" on coins they had tested. What does that tell you about where this coin traveled?
- Look at the edge and the wear. How can you tell this coin was used for a long time?

Talk about it

1. Why would merchants in China, India and America all trust this coin?
2. If someone shaved a little silver off the edge of each coin, what would happen to its value? How did milled edges help?

3. Which of money's three jobs did the piece of eight do best?

PROJECT

The Silver Fleet Auction

Your family will run a small market in which the same goods are bought with a fixed amount of “silver,” then a silver fleet arrives and everyone has twice as much. You will record prices in each round and calculate the percent change.

You will need

- Ten identical small goods for sale (cookies, apples or wrapped candies)
- Pennies or dried beans as “silver coins” (about 100)
- Index cards for bids, a pencil and a calculator
- Two to four family members as buyers and one as the seller

Steps

1. **Round 1.** Give each buyer the same number of coins (for example, 10 each). The seller auctions the ten goods one at a time to the highest bidder. Record each winning price in a table: Round, Good number, Price.
2. Find the average price in Round 1 (total of winning bids ÷ number of goods sold).
3. Return the goods and coins. **The silver fleet arrives.** Give each buyer twice as many coins (20 each), but put out exactly the same ten goods.
4. **Round 2.** Auction the goods again in the same way and record every winning price. Find the average.
5. Calculate the percent change in the average price: $(\text{Round 2 average} - \text{Round 1 average}) \div \text{Round 1 average} \times 100$.
6. Optional **Round 3:** give the original 10 coins each, but add five more goods. Predict, then auction, and record what happens to prices.
7. Write a paragraph: Was the family richer in Round 2? Who gained and who lost? How is this like Spain in the 1500s?

Tips

- Buyers should bid what they really think a good is worth to them. If they all hold back, try the round again.

- Prices may not exactly double. Real markets are not perfect, but look for the direction of the change.

Check your work

- ☐ I can calculate an average price and a percent change.
- ☐ I can explain why more money with the same goods leads to higher prices.
- ☐ I can tell how Spanish silver became the first global money.

LEDGER NOTEBOOK

1. Draw a world map showing the silver routes: Potosí and Zacatecas to Seville; Acapulco to Manila to China; and Spain on to the rest of Europe.
2. Make a timeline: 1545 Potosí; 1546 Zacatecas; 1556 Azpilcueta; 1557 first Spanish default; 1565 Manila galleons begin; 1568 Bodin; 1792 the U.S. dollar; 1857 Spanish coins no longer legal tender in the U.S.
3. Copy the island model (100 loaves, 100 coins, then 200 coins) and draw it as a before-and-after picture.
4. Write one sentence explaining the difference between money and wealth.

From history. On the edge of the Pacific, at Manila, Chinese merchants traded silk and porcelain for Spanish silver. So much silver reached China that Spanish dollars circulated there for centuries, and Chinese merchants stamped small marks on coins they had tested. Some surviving pieces of eight are covered with these tiny “chop marks.”

COMMON MISTAKES

- Thinking more money always means more wealth. Wealth is the goods, services and skills people produce; more money with the same goods only raises prices.
- Thinking only Spain felt the price rise. The silver spread through trade, and prices rose across Europe and beyond.
- Forgetting the human cost. Much of the silver was mined under forced labor, a wrong that should be remembered with the story of the coin.

Make it a game • Potosi to Prices. Mark corners of a room as Potosi, Spain, Asia and the colonies. Carry a bean of silver from corner to corner, naming what it paid for at each stop. Every trip, add a bean to the pile and write a higher price tag for a loaf of bread. After four stops, explain the price rise of the 1500s.

Scripture. “The silver is mine, and the gold is mine, saith the LORD of hosts.” (Haggai 2:8, KJV)

The silver of Potosí made some people proud and others suffer, yet it belonged to God all along. We are stewards, not owners, of the wealth that passes through our hands.

2.3 CENTRAL BANKS: THE BANK OF ENGLAND AND THE FEDERAL RESERVE

OBJECTIVES

- Tell why the Bank of England was founded in 1694 and the Federal Reserve in 1913.
- Explain what a bank run is and why fractional reserves make banks vulnerable to one.
- Name the main jobs of a central bank, including lender of last resort.
- Run a bank-panic simulation and record reserves in a ledger.

Warm-up. Your family keeps a “bank” in a jar. Ten people have put in \$10 each, and you have lent \$70 of it to a neighbor to fix his roof. How much is still in the jar? What happens if four depositors come for their money on the same day? Write your answer.

WATCH

Jekyll Island and the Creation of the Federal Reserve

Atlanta Fed • 4:44

<https://www.youtube.com/watch?v=Xoz4jbEZzlc>

WHEN TO WATCH

After the story of the Panic of 1907, before the big idea.

Note: From the Federal Reserve Bank of Atlanta, filmed at Jekyll Island, Georgia.

BACKUP VIDEO

The Fed in Five | A History of the Federal Reserve

Federal Reserve Bank of St. Louis • 4:54

https://www.youtube.com/watch?v=M7nj2X-yl_U

After the lesson, for a quick tour of the Fed’s first hundred years.

KEY TERMS

central bank

A nation's main bank, which acts as the government's bank and the bankers' bank, issues or manages the currency, and works to keep money and the banking system sound.

fractional reserves

The practice of keeping only part of depositors' money on hand in the bank and lending out the rest.

bank run

When many depositors fear a bank will fail and rush to withdraw their money at once.

lender of last resort

A central bank's job of lending to sound banks in a panic, so that a run does not destroy healthy banks.

reserve ratio

The fraction of deposits a bank keeps on hand: $\text{reserve ratio} = \text{reserves} \div \text{deposits}$.

CORE IDEAS

The story. In 1694 King William III's government needed money badly for a long war with France. A Scottish merchant named William Paterson and a group of London merchants proposed a new kind of company: investors would lend the government £1,200,000, and in return they would receive interest and a royal charter to form a bank. The money was raised within days, from more than a thousand subscribers. This was the Bank of England. It took deposits, lent to merchants, and issued paper notes promising to pay the bearer in coin. Over the next 150 years it slowly became the bank that other banks relied on, keeping their reserves and lending to them when they were short. Two centuries later, the United States still had no such bank. In October 1907 a large New York trust company failed, panic spread, and people lined up outside banks to take out their money. The banker J. P. Morgan gathered other bankers in his library and pressed them to put up money to save the sound banks. It worked, but Americans realized it was dangerous to depend on one rich man.

How they figured it out. Banks keep only a fraction of deposits as cash, their **reserves**, and lend out the rest. That is how they earn interest to pay depositors, and

it is safe on an ordinary day, because only a few depositors want cash at once. But if many come at once, even a sound bank cannot pay them all, because its money is out in loans. Fear can then spread from bank to bank: a **bank run**. In 1873 the British writer Walter Bagehot argued that in a panic the Bank of England should lend freely to sound banks, against good security and at a high rate of interest, so that panics would burn out. After 1907, Congress studied the problem. In November 1910, a small group of bankers and Senator Nelson Aldrich met quietly at Jekyll Island, Georgia, to draft a plan. After much debate, Congress passed the Federal Reserve Act, signed on December 23, 1913. It created twelve regional Federal Reserve Banks around the country and a board in Washington, so that no single city or bank would control the system.

The big idea. A **central bank** does several jobs: it is the government's bank; it is the bankers' bank, holding their reserves; it manages the nation's currency; it acts as **lender of last resort** in a panic; and today it influences interest rates to keep prices stable and the economy steady. Here is the arithmetic of reserves. If a bank has \$1,000 in deposits and keeps \$100 in cash, its **reserve ratio** is $100 \div 1,000 = 0.10$, or 10%. It can pay any withdrawals up to \$100 at once. If \$300 is demanded in one day, it needs help, even if all its loans are good.

Think it through. Central banks do not always succeed. In the early 1930s the Federal Reserve did not lend enough to stop waves of bank runs, and thousands of American banks failed. That hard lesson led to deposit insurance in 1933, which is taught in Grade 7. A central bank, like any human institution, needs wise, honest leaders and clear limits.

In business today. The Federal Reserve's goals, set by Congress, are stable prices and maximum employment. It watches inflation, lends to banks and changes a key interest rate when needed. Ordinary families rarely think about it, but it affects the interest on their savings, car loans and home loans. The Bank of England still stands on Threadneedle Street in London, where it has been since 1734.

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 was a book of prints showing the great buildings of London and the people who used them. Pugin drew the buildings and Rowlandson drew the people. Here merchants and messengers come to the Bank of England's great hall to deposit money, collect interest and exchange notes.

Look closely

- Find the clerks behind the counters. What are they doing?
- Find the customers. What kinds of people do they seem to be? Are any carrying bags or papers?
- Look at the building: the columns, the dome, the windows. Why would a bank want a building that looks like this?

Talk about it

1. What would you have to believe about this bank before you left your money here?
2. If a rumor spread that the Bank could not pay, what might this hall look like the next morning?
3. How is this hall like and unlike a bank you have visited?

PROJECT

Panic at the Banks: A Lender-of-Last-Resort Simulation

Your family will run three small banks with fractional reserves. Depositors will draw cards to see who wants cash, a rumor will start a panic, and you will see what happens with and without a central bank. Every bank keeps a ledger.

You will need

- Play money or slips of paper (\$1,000 in “deposits” per bank)
- A deck of cards or slips marked “withdraw \$100,” “withdraw \$200” and “no withdrawal”
- Three ledger pages, one for each bank: Round, Deposits, Reserves, Loans, Withdrawals, Reserves left
- A family member to play the central bank

Steps

1. Set up three banks. Each has \$1,000 in deposits and keeps \$100 in cash reserves (reserve ratio 10%) and \$900 “out” in loans. Write the starting numbers in each ledger.
2. **An ordinary day.** Each bank draws two withdrawal cards from a deck that is mostly “no withdrawal.” Pay out what is asked, record it and check the reserves left. Can every bank pay?
3. **A rumor.** Announce: “Bank B may be in trouble!” Shuffle in more withdrawal cards. Bank B draws four cards. Record what happens when it runs out of cash.
4. **The panic spreads.** Banks A and C each draw three cards. Record the results.
5. **Replay with a central bank.** Start over. This time, when a sound bank runs short, it may borrow from the central bank by pledging some of its good loans and paying 10% interest. Record each loan in the bank’s ledger and in the central bank’s ledger.
6. Compare the two games in a table: banks that closed, depositors who were paid, interest paid to the central bank.

7. Calculate each bank's reserve ratio at the start and at its lowest point (reserves $\div$ deposits $\times$ 100).
8. Write a paragraph: Why did sound banks fail in the first game? How did the lender of last resort help? Why should it charge interest and lend only against good security?

Tips

- Remind everyone that the banks' loans were good. The trouble was timing and fear, not bad loans.
- Keep every ledger exact. In a real panic, honest records are what let the central bank tell a sound bank from a failing one.

Check your work

- ☐ I can calculate a reserve ratio.
- ☐ I can explain how a bank run happens even at a sound bank.
- ☐ I can name at least three jobs of a central bank.

LEDGER NOTEBOOK

1. Draw a diagram of a fractional-reserve bank: depositors' money flowing in, part kept as reserves, part lent to borrowers.
2. Make a timeline: 1694 Bank of England; 1734 Threadneedle Street; 1873 Bagehot; 1907 Panic; 1910 Jekyll Island; 1913 Federal Reserve Act; 1914 the Reserve Banks open.
3. Draw a map of the United States and mark the twelve Federal Reserve Bank cities: Boston, New York, Philadelphia, Cleveland, Richmond, Atlanta, Chicago, St. Louis, Minneapolis, Kansas City, Dallas and San Francisco.
4. Copy your ledger from the panic game and circle the moment Bank B ran out of cash.

From history. Sir John Houblon, a London merchant, was the first Governor of the Bank of England. Three centuries later, in 1994, his portrait was printed on the Bank of England's £50 note, along with a picture of his house on Threadneedle Street, where the Bank first did its business.

COMMON MISTAKES

- Thinking a bank keeps all your money in a vault. Banks keep a fraction as reserves and lend the rest; that is how they pay interest.

- Thinking a bank run means the bank was dishonest. Runs can hit sound banks when fear spreads.
- Thinking the Federal Reserve is one bank in Washington. It is a system of twelve regional banks and a board.

Make it a game • Last Resort Lender. You are the central bank. Your parent runs a pretend bank with ten buttons and keeps only two as reserves, lending out the rest. Suddenly everyone asks for deposits. See what happens, then lend reserves as lender of last resort. Replay with a larger reserve ratio. Which one stood strong? Explain fractional reserves.

2.4 MEASURING INFLATION: THE PRICE INDEX, WITH NUMBERS

OBJECTIVES

- Explain what a price index measures and how the Consumer Price Index is built.
- Calculate a price index and an inflation rate with the percent-change formula.
- Explain why printing money to pay bills leads to inflation, using Weimar Germany and Zimbabwe as lessons.
- Build a price index for a family basket of goods.

Warm-up. Ask a parent or grandparent what a gallon of milk, a loaf of bread or a postage stamp cost when he or she was your age. Write down three items, the year and the prices. Do you think things cost more now because they are better, or for another reason?

WATCH

Inflation - Economic Lowdown

Federal Reserve Bank of St. Louis • 4:55

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

WHEN TO WATCH

After the story, before the big idea. Pause when the price index is explained and write the formula in your notebook.

BACKUP VIDEO

Introduction to inflation | Inflation - measuring the cost of living | Macroeconomics | Khan Academy

Khan Academy • 7:32

<https://www.youtube.com/watch?v=AaR1mPrdbTc>

After the project, for another worked example of measuring inflation.

KEY TERMS

price index

A number that compares the cost of a fixed basket of goods in one year with its cost in a base year, which is set equal to 100.

base year

The starting year a price index compares against. Its index value is 100.

hyperinflation

Extremely rapid inflation, when prices rise so fast that money becomes nearly worthless.

Consumer Price Index (CPI)

The main U.S. price index, published every month by the Bureau of Labor Statistics, based on the prices of goods and services households buy.

inflation rate

The percent change in a price index from one year to the next: $(\text{new index} - \text{old index}) \div \text{old index} \times 100$.

purchasing power

How much a unit of money can buy.

CORE IDEAS

The story. A first-class postage stamp in the United States cost 5¢ in 1963. In 1974 it cost 10¢. Did letters become twice as good? No. The stamp was the same; the dollar had changed. Over those years the prices of almost everything rose, and each dollar bought less. Economists call this **inflation**, and in the 1970s it became a serious problem for American families, who found their savings and pay buying less each year. To manage inflation, you first have to measure it. But how do you measure “prices in general,” when some prices go up, some go down and some stay the same?

How they figured it out. The answer is a **price index**. Economists choose a “basket” of the goods and services a typical household buys: food, rent, clothing, gasoline, doctor’s visits, and so on. They price the same basket month after month. In the United States, the Bureau of Labor Statistics does this for the **Consumer Price Index**, with workers checking prices in stores and offices across the country. The cost of the basket in a **base year** is set equal to 100. *Price index = cost of the basket this year ÷ cost of the basket in the base year × 100*. If the basket cost \$50.00 in the base year and \$53.00 this year, the index is $53 \div 50 \times 100 = 106$. Prices are 6% higher than in the base year.

The big idea. The **inflation rate** is the percent change in the index: $(\text{new} - \text{old}) \div \text{old} \times 100$. If the index goes from 106 to 109.18, inflation is $(109.18 - 106) \div 106 \times 100 = 3\%$.

Small rates add up. At about 2% a year, prices double in about 35 years; at 7%, in about 10 years. (A handy shortcut, the “rule of 70”: years to double $\approx 70 \div$ the inflation rate.) Inflation lowers money’s **purchasing power**, and it hurts most the people who save in cash or live on fixed incomes. The usual cause of steady, high inflation is that the money supply grows much faster than the goods and services people produce, as with Spanish silver in Lesson 2.2.

Who gained? When governments print money to pay their bills, the results can be disastrous. In Germany in 1923, the government printed marks so fast that prices doubled every few days; by November, one U.S. dollar was worth about 4.2 trillion marks, and families’ lifetime savings were wiped out. In Zimbabwe, in 2008, prices rose so fast that the government issued a 100-trillion-dollar note in early 2009, and people stopped using the Zimbabwe dollar altogether. In each case, debtors and the government gained for a moment, while savers, workers on fixed wages and the poor lost the most. This is **hyperinflation**. It is like changing the measure in the middle of every sale.

In business today. Businesses watch the CPI to set prices and wages, and many contracts and pensions are adjusted by it. Families can use it to compare prices across years honestly: a \$1 candy bar in 1990 and a \$2 candy bar today may cost about the same in purchasing power. A wise saver remembers that money hidden in a mattress slowly loses value, which is one reason to save in ways that earn interest (Unit 8).

PICTURE STUDY



Canned Goods in a Company Store, Gary, West Virginia, Russell Lee, 1946 · Black-and-white photograph (U.S. government work) · U.S. National Archives
Image: [Wikimedia Commons](#), public domain

Russell Lee photographed this store in 1946 for a government survey of life in coal-mining towns. Stores like this one, owned by the mining company, sold food and household goods to miners' families. The shelves are a ready-made “basket” of the goods a family bought every week.

Look closely

- Find any prices or labels you can read. What kinds of goods are on the shelves?
- Choose five items a family would buy every week. Could you build a price index from them?
- Look at how the goods are arranged. What do you think the storekeeper wanted customers to notice first?

Talk about it

1. If you could price these same five items today, how would you use them to measure inflation since 1946?
2. Why might prices in a company store have been different from prices in a town with several competing stores?

3. Which items on these shelves would a family keep buying even if prices rose? Which might they stop buying?

PROJECT

Our Family Price Index

You will choose a basket of eight goods your family really buys, find their prices at two dates (or two stores), and calculate a price index and a percent change, just as the Bureau of Labor Statistics does for the whole country.

You will need

- Old receipts, store flyers, online grocery prices (with a parent) or a trip to the store
- Ledger notebook or a free spreadsheet
- A calculator

Steps

1. With a parent, choose eight things your family buys regularly, such as milk, bread, eggs, apples, rice, cereal, soap and gasoline. Decide how much of each your family buys in a typical week (the “basket”).
2. Find an old price for each, from a receipt at least six months old or from a parent’s records. This is your base period. Write the date.
3. Find today’s price for each item, in the same size and brand if possible.
4. Make a table: Item, Amount in basket, Base price, Base cost (amount $\times$ price), Today’s price, Today’s cost.
5. Add up the base cost and today’s cost of the whole basket.
6. Calculate your family price index: $\text{today's cost} \div \text{base cost} \times 100$.
7. Calculate the percent change for each item and for the whole basket: $(\text{today} - \text{base}) \div \text{base} \times 100$. Which item rose the most? Did any fall?
8. Write a paragraph: How did your family index compare with the most recent CPI inflation rate your parent can look up? Why might they differ?

Tips

- Keep the basket the same. If you change the items or the amounts, you are no longer measuring price changes alone.
- If you cannot find old prices, compare two stores this week instead and build an index with one store as the base.

Check your work

- ☐ I can calculate a price index from a basket.
- ☐ I can calculate a percent change with the formula $(\text{new} - \text{old}) \div \text{old} \times 100$.
- ☐ I can explain why printing money to pay bills causes inflation.

LEDGER NOTEBOOK

1. Copy the two formulas in a box: price index = this year's cost $\div$ base-year cost $\times$ 100; inflation rate = $(\text{new} - \text{old}) \div \text{old} \times 100$.
2. Make a line graph of your family's basket cost at the dates you found.
3. Use the rule of 70 to make a table: how many years until prices double at 2%, 3.5%, 5%, 7% and 10% inflation?
4. Write a short letter from a German saver in 1923 to a grandchild, explaining what happened to the family's savings and what lesson to learn.

From history. In the worst months of 1923, German workers were sometimes paid twice a day and rushed to spend their wages before prices rose again. In November 1923 Germany introduced a new currency, the Rentenmark, and strictly limited how many were issued. Prices steadied almost at once, showing that the cure for runaway inflation is to stop making too much money.

COMMON MISTAKES

- Dividing by the wrong number. In a percent change, always divide by the old number.
- Thinking one price rising is inflation. Inflation is a rise in prices in general, measured across a whole basket.
- Thinking printing money makes a country richer. It only adds more money for the same goods, so prices rise.

Make it a game • Basket Index Sprint. Choose five kitchen items and write their old prices as your base year. Your parent secretly sets new prices on slips. In three minutes, total the basket, build the price index and figure the inflation rate by percent change. Whoever is closest on the first try wins. Then say what happens to purchasing power.

Scripture. “Divers weights, and divers measures, both of them are alike abomination to the LORD.” (Proverbs 20:10, KJV)

A merchant who secretly changes his weights cheats his customers. A government that floods the land with money changes the measure for everyone at once, and savers and the poor are cheated most of all. Honest money is a matter of justice.

UNIT 2

THE STORY OF MONEY

Money is one of the most useful inventions in history, but it is also one of the most misunderstood. In this unit you will learn the **three jobs** that anything must do to work as money, and test them on the great stone wheels of the island of Yap. Then you will follow the river of Spanish silver that poured out of the mountain of Potosí in the 1500s, became the world's first global coin, the piece of eight, and caused prices across Europe to climb for a hundred years.

You will also learn what a **central bank** is and why the Bank of England (1694) and the Federal Reserve (1913) were founded, and you will measure **inflation** the way economists do, with a price index and the percent-change formula. By the end you should be able to explain, with numbers, why printing more money does not make a country richer, and why honest money is a matter of justice: “Divers weights, and divers measures, both of them are alike abomination to the LORD” (Proverbs 20:10).

PREREQUISITES

- Knows barter, commodity money, the first coins and the gold standard (Grade 5, Unit 2)
- Can calculate a percent and a percent change
- Can multiply and divide decimals with a calculator

MASTERY CHECKLIST

- ☐ I can name and explain money's three jobs and the qualities of good money, using the stones of Yap.
- ☐ I can tell how Spanish silver from Potosí became the first global money, and explain why more silver made prices rise.
- ☐ I can explain what a central bank does, and tell why the Bank of England and the Federal Reserve were founded.
- ☐ I can build a simple price index and calculate an inflation rate with the percent-change formula.
- ☐ I can explain why printing more money does not make a country richer.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Federal Reserve History**: Free. Short, reliable essays and pictures on the founding of the Fed, the Panic of 1907, the gold standard and the history of American money. Good for Lesson 2.3 and the portfolio. Ages 11 and up with a parent.
- **Bank of England Museum**: Free. The museum's website has pictures and short articles on the founding of the Bank in 1694, early banknotes and the gold vaults. Fits Lesson 2.3.
- **Econ Lowdown (Federal Reserve Bank of St. Louis)**: Free lessons, videos and games on money, inflation and banking from the St. Louis Fed. A parent can set up a free account; many videos are also on the St. Louis Fed's YouTube channel.

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 Money's Three Jobs: The Stones of Yap	2 sessions of 50 minutes
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2.2 Spanish Silver and the Great Price Rise	2 sessions of 50 minutes
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2.3 Central Banks: The Bank of England and the Federal Reserve

2 sessions of 50 minutes

2.4 Measuring Inflation: The Price Index, with Numbers	2 sessions of 50 minutes
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UNIT 2 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. **8 pts**

Name money's three jobs and give an example of each.

2. **8 pts**

The stone at the bottom of the sea on Yap still counted as money. What does this show about what makes something money?

3. (8 pts)

Rate dried beans as money on two qualities of good money it has and two it lacks. Explain.

4. (8 pts)

Where was the great silver mountain of Potosí, and what was the Spanish coin made from its silver called?

5. (10 pts)

An island has 50 baskets of fish and 50 coins, and all the coins are spent on fish. A ship brings 100 more coins but no more fish. What price per basket would you expect, and what is the percent change?

6. (8 pts)

How did the Spanish dollar shape American money?

7. (8 pts)

Why was the Bank of England founded in 1694, and why was the Federal Reserve founded in 1913?

8. (8 pts)

A bank has \$5,000 in deposits and keeps \$400 in cash. What is its reserve ratio? Can it pay \$600 in withdrawals in one day without help?

9. (8 pts)

What does a lender of last resort do, and why does it help stop a bank run?

10. (10 pts)

A basket of goods cost \$80.00 in the base year and \$86.00 this year. Find the price index. If next year the basket costs \$88.58, what is next year's inflation rate?

11. (6 pts)

Use the rule of 70 to estimate how long it takes prices to double at 5% inflation a year.

12. (10 pts)

Short answer: Explain why printing more money does not make a country richer. Use Weimar Germany or Zimbabwe as an example.

ANSWER KEY

1. Medium of exchange (paying for groceries with dollars); unit of account (a price tag of \$3.49, or a record of a debt in dollars); store of value (saving \$20 to spend next month).
2. Money works because people agree on who owns it and trust that it will be accepted. It is a system of shared records and trust, not just a valuable object.
3. Has (any two): divisible, fairly uniform, portable in small amounts. Lacks (any two): durability over a long time (can spoil or get eaten), limited supply (anyone can grow more), acceptance by stores.
4. In the Andes mountains of what is now Bolivia; the coin was the peso de a ocho, the piece of eight (Spanish dollar).
5. Before: $50 \text{ coins} \div 50 \text{ baskets} = 1 \text{ coin per basket}$. After: $150 \text{ coins} \div 50 \text{ baskets} = 3 \text{ coins per basket}$. Percent change = $(3 - 1) \div 1 \times 100 = 200\%$.
6. Colonists used Spanish dollars widely, so the U.S. dollar created in 1792 was based on it; Spanish coins stayed legal tender in the U.S. until 1857, and “two bits” for a quarter comes from cutting a piece of eight into eight bits.
7. The Bank of England was founded when merchants lent £1,200,000 to King William III’s government for a war, in return for interest and a charter to form a bank. The Federal Reserve was founded after the Panic of 1907 showed that the U.S. needed a lender of last resort and a sounder banking system.
8. Reserve ratio = $400 \div 5,000 = 0.08 = 8\%$. No; it has only \$400 on hand and would need \$200 more, from borrowing or calling in loans.
9. It lends to sound banks during a panic, against good security. Depositors can be paid, fear calms down, and healthy banks do not fail just because too many people asked for cash at once.
10. Index = $86 \div 80 \times 100 = 107.5$. Next year’s index = $88.58 \div 80 \times 100 \approx 110.7$. Inflation = $(110.7 - 107.5) \div 107.5 \times 100 \approx 3\%$ (or $(88.58 - 86) \div 86 \times 100 = 3\%$).
11. $70 \div 5 =$ about 14 years.
12. A country’s wealth is the goods and services it produces. Printing more money without producing more goods only means more money chasing the same goods, so prices rise and each unit of money buys less. In Germany in 1923, printing marks to pay bills made prices double every few days and wiped out savings; in Zimbabwe in 2008 the same thing happened. (Accept any clear, accurate explanation with an example.)

PORTFOLIO PIECE: A MONEY TIMELINE AND PRICE INDEX REPORT

Make a two-part report. Part 1: an illustrated timeline of money from the stones of Yap and the piece of eight to the Bank of England, the Federal Reserve and today's dollar, with at least eight dated events and one sentence for each saying which of money's three jobs it helped or harmed. Part 2: your family price index from Lesson 2.4, extended with a second check of prices four weeks later. Include your table, your index and percent-change calculations, a line graph, and a paragraph explaining what you found and what a family can do to protect its savings from inflation.

LOOK FOR	WHAT IT MEANS
Accuracy	Dates, names and events on the timeline are correct and match the lessons or reliable sources.
Calculations	The price index and percent changes are correct, with formulas, units and labeled tables.
Understanding	Clearly explains money's three jobs, the role of a central bank and why too much money causes inflation.
Presentation	A neat timeline with pictures or drawings, a clear graph and complete sentences.

UNIT 3

MARKETS

A market is any place, or any way, that buyers and sellers meet to trade. In this unit you will go deeper into how markets work. You will draw a **demand curve** and measure **elasticity**, which tells how strongly buyers respond to a change in price, using the story of Rowland Hill's penny post, which cut the price of a letter and changed how a whole nation wrote to each other. You will learn the **four market structures**, from thousands of wheat farmers selling at the Chicago Board of Trade to a single water company, and weigh the strengths and limits of each.

Then you will study two places where markets need special care. When governments set a **price ceiling** below what the market would set, as American gasoline prices were held in the 1970s, the result is a shortage and long lines. And some services, like water pipes and power lines, are **natural monopolies**, which is why towns regulate them through utility commissions. Good markets need honest rules, and good rules respect how markets work.

PREREQUISITES

- Knows supply and demand, competition and monopoly simply (Grade 5, Unit 3)
- Can calculate a percent change
- Can plot points on a graph

MASTERY CHECKLIST

- ☐ I can draw a demand curve from a demand schedule and explain the law of demand.
- ☐ I can calculate price elasticity of demand and use the revenue test to tell elastic from inelastic demand.
- ☐ I can describe the four market structures and give the strengths and limits of each.
- ☐ I can explain why a price ceiling below the market price causes a shortage, using the gas lines of 1979.
- ☐ I can explain what a natural monopoly is and how a utility commission regulates it.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Khan Academy: Microeconomics**: Free. Short videos and practice problems on demand, elasticity, market structures and price controls. Written for high-school and college students; a strong sixth grader can try the elasticity practice with a parent after Lesson 3.1.
- **Catan (board game)**: A family trading game in which the value of wheat, wood, brick, ore and wool rises and falls with scarcity. After a game, talk about which resources were in short supply and how that changed the trades people would accept. Ages 10 and up. Optional.

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 Demand Curves and Elasticity: Rowland Hill's Penny Post

2 sessions of 50 minutes

3.2 The Four Market Structures

2 sessions of 50 minutes

3.3 Price Ceilings and Shortages: The Gas Lines of 1979

2 sessions of 50 minutes

3.4 Natural Monopolies: Edison's Pearl Street Station and the Utility Commission

2 sessions of 50 minutes

UNIT 3 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. **8 pts**

State the law of demand. Why does a demand curve slope down?

2. **10 pts**

A bakery cuts the price of a muffin from \$2.00 to \$1.50 and its sales rise from 100 to 150 muffins a day. Calculate the elasticity of demand and the total revenue before and after. Is demand elastic or inelastic?

3. **8 pts**

After the penny post began in 1840, letters more than doubled, but the Post Office's income fell. What does this tell you about the elasticity of demand for letters at that time?

4. **6 pts**

Give one good with elastic demand and one with inelastic demand, and explain why.

5. **10 pts**

Name the four market structures and give one example of each.

6. **8 pts**

How did the Chicago Board of Trade's grading of wheat in 1856 make the wheat market more competitive?

7. **8 pts**

Give one strength and one limit of an oligopoly.

8. **10 pts**

At a price ceiling of \$3 a ticket, 900 people want concert tickets but only 500 seats are offered. What is the shortage? Name two ways the tickets might end up being rationed.

9. **8 pts**

Why were there long gas lines in 1979, and what happened after price controls ended in 1981?

10. **10 pts**

A gas company's network costs \$600,000 a year plus \$20 per customer. Find the average cost per customer if one company serves 6,000 customers, and if two companies each serve 3,000.

11. **6 pts**

A utility has operating costs of \$30,000, a rate base of \$100,000 and an allowed return of 10%. What revenue should the commission allow?

12. **8 pts**

Short answer: Explain why markets need honest rules, but why rules that ignore prices can hurt the people they aim to help. Use one example from this unit.

ANSWER KEY

1. When the price of a good rises, buyers buy less; when it falls, they buy more, other things staying the same. The curve slopes down because at lower prices people buy more.
2. Price change = $(2.00 - 1.50) \div 2.00 = 25\%$. Quantity change = $(150 - 100) \div 100 = 50\%$. Elasticity = $50 \div 25 = 2$, so demand is elastic. Revenue before = $\$2.00 \times 100 = \$200$; after = $\$1.50 \times 150 = \$225$. Revenue rose, as the revenue test predicts for elastic demand.
3. People responded to the lower price, but not enough to make up for the huge drop in price, so revenue fell. By the revenue test, demand was inelastic over that price change.
4. Elastic: one brand of cereal, because there are many substitutes. Inelastic: salt or a needed medicine, because there are few substitutes and it is a need. (Accept other reasonable examples.)
5. Perfect competition (wheat farmers); monopolistic competition (restaurants or bakeries); oligopoly (airlines or automobile makers); monopoly (the local water company).
6. Grading made wheat of the same grade identical, so it could be mixed in elevators and traded by receipt. Thousands of farmers sold a uniform product, and no single seller could set the price.
7. Strength: large firms can build big factories or networks and lower costs. Limit: a few sellers may be tempted to stop competing and agree to keep prices high (a cartel).
8. Shortage = $900 - 500 = 400$ tickets. Rationing could happen by waiting in line, first come first served, drawing names, favoritism, or illegal resale at higher prices (any two).
9. Controlled prices were held below the market price after oil supplies fell, so more gasoline was demanded than supplied at stations, and allocation rules were slow. After controls ended, prices rose briefly, the lines disappeared, more oil was brought to market and prices fell during the 1980s.
10. One company: $(\$600,000 + \$20 \times 6,000) \div 6,000 = \$720,000 \div 6,000 = \$120$. Two companies: each $(\$600,000 + \$20 \times 3,000) \div 3,000 = \$660,000 \div 3,000 = \$220$. One network is much cheaper per customer.
11. Allowed revenue = $\$30,000 + 0.10 \times \$100,000 = \$30,000 + \$10,000 = \$40,000$.

12. Rules against fraud, secret price-fixing and overcharging by monopolies keep markets fair and open. But rules that set prices below what the market would set, like the gasoline price controls of the 1970s, create shortages, lines and waste, which hurt the very drivers they were meant to protect. Good rules act like a fair referee. (Accept any clear answer with an accurate example.)

PORTFOLIO PIECE: A LOCAL MARKET REPORT

Choose one product your family buys often (bread, eggs, gasoline, haircuts or another). With a parent, find its price at three sellers and, if possible, at two times a month apart. Write a one-to-two-page report with four headings: The market (its structure, with reasons), The prices (a table, a bar graph and the percent difference between the cheapest and dearest seller), The buyers (is demand elastic or inelastic, and why?), and The rules (who regulates this market, if anyone, and what honest rules protect buyers and sellers). End with a paragraph of advice for a new seller who wants to enter this market.

LOOK FOR	WHAT IT MEANS
Research	Real prices from at least three sellers, with dates, in a labeled table and graph.
Economic reasoning	Correctly identifies the market structure and the elasticity of demand, with reasons.
Calculations	Percent differences and changes are correct, with formulas and units shown.
Judgment and presentation	Thoughtful advice and a fair discussion of rules, in clear, complete sentences.

3.1 DEMAND CURVES AND ELASTICITY: ROWLAND HILL'S PENNY POST

OBJECTIVES

- Tell how Rowland Hill's penny post of 1840 cut the price of sending a letter and how the public responded.
- Make a demand schedule and draw a demand curve.
- Calculate price elasticity of demand and use the revenue test.
- Explain what makes demand for a good elastic or inelastic.

Warm-up. Your favorite snack costs \$1.00. Write how many you would buy in a month at \$0.50, \$1.00, \$2.00 and \$4.00. Now do the same for toothpaste. Which list changes more as the price changes? Why?

WATCH

Price Elasticity of Demand: What Is Elasticity? | Part 1

Federal Reserve Bank of St. Louis • 6:01

<https://www.youtube.com/watch?v=Fc4KIRKM-tQ>

WHEN TO WATCH

After the story of the penny post, before the big idea. Pause when elastic and inelastic are defined and write an example of each.

BACKUP VIDEO

Introduction to price elasticity of demand | AP® Microeconomics | Khan Academy

Khan Academy • 8:40

<https://www.youtube.com/watch?v=FBWJYH8DZ1g>

After the project, for a second worked example with a graph.

KEY TERMS

law of demand

When the price of a good goes up, buyers buy less of it; when the price goes down, they buy more, other things staying the same.

demand schedule

A table showing how much of a good buyers will buy at each price.

demand curve

A graph of the demand schedule, with price on the vertical axis and quantity on the horizontal axis. It slopes down from left to right.

price elasticity of demand

How strongly the quantity bought responds to a change in price:

elasticity = percent change in quantity
÷ percent change in price (ignoring the minus sign).

elastic and inelastic

Demand is elastic when elasticity is greater than 1 (buyers respond a lot) and inelastic when it is less than 1 (buyers respond only a little).

total revenue

The money a seller takes in: total revenue = price × quantity sold.

CORE IDEAS

The story. In the 1830s, sending a letter in Britain was costly and complicated. The charge depended on the distance and the number of sheets of paper, and it was usually paid by the person who received the letter. A letter from London to Scotland could cost more than a shilling, a large part of a working man's daily wage. Many families simply did not write, and others cheated, hiding coded messages on the outside of letters so the receiver could read them and refuse to pay. Rowland Hill, a schoolmaster with a gift for figures, studied the Post Office's accounts. In 1837 he published a pamphlet arguing that most of the cost of a letter was in handling it, not carrying it, and that a low, uniform price paid in advance by the sender would bring in so many more letters that the Post Office would still do well.

How they figured it out. Parliament agreed to try. On January 10, 1840, the price of a letter anywhere in Britain fell to one penny for half an ounce. In May came the Penny Black, the world's first adhesive postage stamp, so that senders could pay before mailing. The public responded at once: the number of letters more than doubled in the first year and kept climbing for decades. Merchants sent catalogs and bills, families kept in touch across the country, and new businesses grew up around the mail. But Hill's hope about money proved only partly right. The price had fallen so far that, even with more than twice as many letters, the Post Office took in less money than before, and it was many years before its income recovered. People responded to the lower price strongly, but not strongly enough to make up the difference.

The big idea. The law of demand says that when price falls, buyers buy more. A **demand schedule** lists the quantity bought at each price, and a **demand curve** graphs it. **Elasticity** measures how much buyers respond: *elasticity = % change in quantity ÷ % change in price*. Example: a lemonade stand charges 50¢ and sells 40 cups (revenue 50¢ × 40 = \$20). At 25¢ it sells 100 cups (revenue \$25). Price fell $(50 - 25) \div 50 = 50\%$; quantity rose $(100 - 40) \div 40 = 150\%$. Elasticity = $150 \div 50 = 3$, greater than 1, so demand is **elastic**, and total revenue rose. When demand is **inelastic** (less than 1), a lower price brings in less money, as with the penny post. This is the **revenue test**: if price and revenue move in opposite directions, demand is elastic; if they move together, it is inelastic.

Think it through. What makes demand elastic? Goods with many substitutes (one brand of cereal among dozens), goods that are luxuries rather than needs, goods that take a large share of a family's budget, and goods where buyers have time to adjust. Demand is inelastic for needs with few substitutes, like salt, heating in winter or a medicine someone must have. That is why it is especially wrong to take advantage of people who must buy: Scripture warns against grinding the face of the poor (Isaiah 3:15).

In business today. Every seller who sets a price is guessing at elasticity. A store that cuts the price of a popular toy may sell so many more that it earns more; a gas station that raises its price by ten cents may lose most of its customers to the station across the street. Businesses test prices carefully, and an honest seller remembers that some buyers have little choice.

PICTURE STUDY



The Penny Black, Designed for Rowland Hill's reform; engraved by Charles and Frederick Heath after a medal portrait by William Wyon, 1840 · Printed postage stamp

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

The Penny Black went on sale on May 1, 1840, and could be used from May 6. It shows the profile of the young Queen Victoria, copied from a medal made when she was fifteen. Each stamp has two letters in its lower corners showing its place on the printed sheet, a clever guard against forgery.

Look closely

- Find the words POSTAGE and ONE PENNY. Why was it important to print the price on the stamp?
- Find the letters in the bottom corners. How could they help catch someone making fake stamps?
- Notice that the stamp does not name the country. Why might Britain, the first country to use stamps, not need to?

Talk about it

1. How did paying in advance with a stamp make the postal system cheaper and more honest?
2. If the price of a stamp doubled tomorrow, would your family send many fewer letters and packages? Is the demand elastic or inelastic? Why?

3. Who gained most from the penny post: merchants, families or the Post Office?

PROJECT

Draw a Real Demand Curve

You will survey family members and friends (with a parent) about how many of a homemade item they would buy at different prices, build a demand schedule, draw the demand curve, find the revenue at each price and calculate elasticity between prices.

You will need

- A simple item you could really make and sell later, such as cookies, bookmarks or greeting cards
- A survey sheet and pencil
- Graph paper, a ruler and a calculator
- At least eight people to survey (family, neighbors you know, church friends), with a parent

Steps

1. Choose four prices for your item, for example 25¢, 50¢, \$1.00 and \$2.00.
2. Ask each person: “How many would you buy in a month at each of these prices?” Record each answer honestly.
3. Add up the answers at each price to make a demand schedule: Price, Quantity demanded.
4. Draw the demand curve on graph paper. Put price on the vertical axis and quantity on the horizontal axis. Label both and give the graph a title.
5. Add a column for total revenue (price $\times$ quantity). Which price brings in the most revenue?
6. Calculate elasticity between each pair of neighboring prices: $\% \text{ change in quantity} \div \% \text{ change in price}$, dividing each change by the starting number. Mark each step as elastic (more than 1) or inelastic (less than 1).
7. Check with the revenue test: when price rises, does revenue fall (elastic) or rise (inelastic)?
8. Write a paragraph: Which price would you choose if you sold your item? Why? What would change your customers’ demand (a holiday, a competitor,

better quality)?

Tips

- Ask your survey questions in a neutral voice so you do not push people toward an answer. Honest data is worth more than pleasing data.
- Keep your demand schedule. You can use it for the market day in Unit 8 and the bonus business in Unit 9.

Check your work

- ☐ I made a demand schedule and drew a labeled demand curve.
- ☐ I calculated total revenue and elasticity between prices.
- ☐ I can explain the revenue test.

LEDGER NOTEBOOK

1. Copy the lemonade example: the demand schedule, the two revenue figures and the elasticity calculation.
2. Draw two demand curves side by side: a steep one labeled “inelastic: salt” and a flat one labeled “elastic: one brand of cereal.”
3. Make a timeline: 1837 Hill’s pamphlet; January 10, 1840 the uniform penny post; May 1840 the Penny Black.
4. List five things your family buys and mark each as elastic or inelastic, with a reason.

From history. Before 1840, some people avoided postage by arranging codes with family members: a letter would be handed to the receiver, who looked at the outside, read the coded marks, and refused to pay for it. Rowland Hill told of seeing a young woman do exactly this. Paying in advance with a stamp ended the trick.

COMMON MISTAKES

- Confusing a change in quantity demanded (moving along the curve because the price changed) with a change in demand (the whole curve shifting because of something else, like a holiday).
- Thinking a lower price always brings in more money. It does only when demand is elastic.
- Putting price on the horizontal axis. By custom, price goes on the vertical axis.

Make it a game • Letters at Every Price. Rowland Hill dropped the price of sending a letter. Your parent says how many letters they would send at prices of ten, eight, six, four and two pretend pennies. Draw the demand schedule and curve, then compute total revenue at each price. Find the price where revenue is highest, and say whether demand is elastic.

3.2 THE FOUR MARKET STRUCTURES

OBJECTIVES

- Describe perfect competition, monopolistic competition, oligopoly and monopoly.
- Tell how the Chicago Board of Trade's grading of wheat helped make grain a competitive market.
- Weigh the strengths and limits of each market structure for customers.
- Classify real local markets by their structure.

Warm-up. Think of four things your family buys: a loaf of bread, a meal at a restaurant, a tank of gasoline and the water from your tap. For each one, how many sellers could you choose from in your town? Rank them from most choice to least.

WATCH

What Are the FOUR Market Structures in Economics? | [WITH EXAMPLES] | Think Econ

Think Econ • 6:55

<https://www.youtube.com/watch?v=u1xIZOieOUw>

WHEN TO WATCH

After the story, before the big idea. Fill in the four-column chart in your notebook as you watch.

BACKUP VIDEO

Monopoly vs. Oligopoly vs. Competition: Monopolies and Oligopolies Defined, Explained and Compared

One Minute Economics • 1:28

<https://www.youtube.com/watch?v=0Gb4t1L2MH0>

For a quick review before the unit review.

KEY TERMS

market structure

The kind of market a good is sold in, described by the number of sellers, how alike their products are, and how easy it is for new sellers to enter.

perfect competition

A market with many sellers of identical products, where no one seller can change the price; for example, wheat farmers.

monopolistic competition

A market with many sellers of products that are similar but not identical, such as restaurants, bakeries and clothing shops.

oligopoly

A market with a few large sellers, each big enough to affect the price, such as airlines or automobile makers.

monopoly

A market with only one seller of a product that has no close substitutes.

barriers to entry

Things that make it hard for new sellers to start, such as high start-up costs, patents, licenses or control of a key resource.

CORE IDEAS

The story. In the 1840s, Chicago was a muddy young town on Lake Michigan. Farmers from the prairies hauled wheat in by wagon, and buyers haggled over every sack, because each farmer's wheat was a little different: cleaner or dirtier, drier or damper. In 1848 a group of merchants founded the Chicago Board of Trade to bring order to the trading. In 1856 the Board did something that changed farming: it set standard **grades** for wheat, such as "No. 1 Spring." Inspectors tested each load and graded it, and the grain of the same grade could be poured into one great grain elevator and mixed. Now a buyer did not need to see a farmer's wheat at all; a receipt for 1,000 bushels of No. 1 Spring was as good as any other.

How they figured it out. Grading turned wheat into a uniform product sold by thousands of farmers to many buyers. No single farmer could change the price; if he asked a penny more than everyone else, no one would buy from him. Prices were set by the whole market, shouted out in the busy "wheat pit" and sent by telegraph across the country. This is close to what economists call **perfect competition**. Other markets work differently. A town's restaurants each offer something a little different, so each has some power over its price, but customers can always go elsewhere: **monopolistic competition**. In the early 1900s there were hundreds of American automobile makers; by the 1950s, three large companies made most American cars: an **oligopoly**. And the water in your tap usually comes from one company or city water department: a **monopoly**.

The big idea. The four market structures differ in the number of sellers, how alike the products are, and the **barriers to entry**. Each has strengths and limits. Perfect

competition keeps prices low and close to cost, but offers no variety and little profit to pay for new ideas. Monopolistic competition gives customers wonderful variety, and sellers compete on quality and service, though prices are a little higher and much is spent on advertising. An oligopoly can build huge factories and airlines no small firm could, which can lower costs, but a few sellers may be tempted to stop competing and quietly agree to keep prices high, which is called a **cartel** and is against the law in most countries. A monopoly can charge more and has little reason to improve, unless it faces the threat of new rivals or is regulated (Lesson 3.4).

Think it through. Most of the time, customers are best served when sellers must compete for their business, because competition rewards service: the seller who makes a better product at a lower price wins. That is why honest rules against fraud, secret price agreements and unfair practices matter. They keep markets open so that new sellers can enter and old ones must keep earning their customers' trust.

In business today. A business owner who knows his market structure knows how to compete. A wheat farmer competes by cutting costs, since he cannot raise his price. A bakery competes on flavor, freshness and friendliness. A large airline competes on routes, schedules and service. And everyone, in every structure, should deal honestly: "A false balance is abomination to the LORD: but a just weight is his delight" (Proverbs 11:1).

PICTURE STUDY



In the Wheat Pit of the Board of Trade of the City of Chicago, Unknown photographer, about 1900 · Photograph · Library of Congress, Washington, D.C.

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

The wheat pit was an eight-sided set of steps in the middle of the Board of Trade's trading floor, where traders stood face to face and shouted and signaled their bids and offers. Each trade set a price that was telegraphed to farmers, millers and bakers across the country within minutes.

Look closely

- Find the eight-sided pit. Why might traders stand on steps around a center instead of on a flat floor?
- Look at the traders' hands. What do you think their signals mean?
- Look for any boards, clocks or telegraph equipment in the hall.

Talk about it

1. Why could no single trader or farmer set the price of wheat?
2. How did grading wheat make this kind of trading possible?
3. Which market structure does this picture show? Explain.

PROJECT

A Market-Structure Survey of Our Town

You will classify eight real markets in your area by their structure, using a scorecard, and then run a short family game to see how prices behave with many sellers and with one.

You will need

- A phone book, a map or a drive around town with a parent
- Ledger notebook and pencil
- Twenty small identical goods (crackers or wrapped candies) and play money for the game

Steps

1. Choose eight markets your family uses: for example, eggs, haircuts, pizza, gasoline, groceries, cell-phone service, electricity and tap water.
2. For each, with a parent, count roughly how many sellers there are within a short drive.
3. Rate each market: How alike are the products (identical, similar, different)? How hard is it for a new seller to start (easy, hard, very hard)? Does any seller set its own price?
4. Make a table with your ratings and decide the market structure for each: perfect competition, monopolistic competition, oligopoly or monopoly. Write a reason.
5. **The game, round 1 (many sellers).** Give three family members five crackers each to sell. One buyer with \$10 in play money buys from whoever offers the best price. Sellers may lower their prices. Record every sale price.
6. **The game, round 2 (one seller).** Give all fifteen crackers to one seller. The buyer must buy from that seller or go without. Record the prices.
7. Compare the average prices in the two rounds and write what happened.
8. Write a paragraph: In which market in your town do customers have the most power? The least? What keeps the sellers in the least competitive market honest?

Tips

- Many real markets fall between two structures. Pick the closer one and explain your choice.
- In the game, the buyer should be willing to walk away from a price that seems too high.

Check your work

- ☐ I can name and describe the four market structures.
- ☐ I classified eight real markets with reasons.
- ☐ I can give one strength and one limit of each structure.

LEDGER NOTEBOOK

1. Draw a four-column chart: Perfect competition, Monopolistic competition, Oligopoly, Monopoly. For each, write the number of sellers, how alike the products are, the barriers to entry, an example and one strength and one limit.
2. Draw a grain elevator with wagons unloading at the bottom and a railroad car loading at the side. Label how grading let wheat from many farms be mixed together.
3. Record the prices from your cracker game in a table and graph the averages.
4. What I would change: one sentence about how you would make the game more realistic.

From history. Grading and storing grain in elevators made it possible to buy and sell grain for delivery months later, which grew into a market for “futures.” Farmers could agree in spring on a price for grain they would deliver in the fall, which helped protect them from a sudden fall in prices.

COMMON MISTAKES

- Thinking “monopolistic competition” means a monopoly. It means many sellers with slightly different products.
- Thinking big is always bad. Large firms can lower costs and build what small firms cannot; the danger comes when they stop competing or act unfairly.
- Forgetting barriers to entry. A market with one seller today may still be competitive if new sellers can easily enter.

Make it a game • Market Structure Match. Make eight cards: four structure names and four examples, such as wheat farmers, cereal brands, three phone makers and the town water company. Lay them face down and play memory match. Keep a pair only if you can state the barriers to entry. Finish by saying how grading wheat helped form a competitive market.

3.3 PRICE CEILINGS AND SHORTAGES: THE GAS LINES OF 1979

OBJECTIVES

- Explain what a price ceiling is and why a ceiling set below the market price causes a shortage.
- Tell the story of the American gas lines of 1979 and how they ended.
- Calculate the size of a shortage from a supply and demand table.
- Explain the hidden costs of a shortage: waiting, lower quality and unfair rationing.

Warm-up. Imagine a rule that says the newest, most popular toy must be sold for only \$5, even though stores pay \$20 for each one. What would happen to how many toys the stores order? What would happen to how many children want one? Write what you think the toy aisle would look like.

WATCH

How Price Ceilings Create Shortages and Lower Quality

Marginal Revolution University • 6:26

<https://www.youtube.com/watch?v=RBGHmCIBr9M>

WHEN TO WATCH

After the story of the gas lines, before the big idea. Pause at the graph and find the shortage.

Note: From the explanatory economics course of Marginal Revolution University, a teaching project of two university economists.

BACKUP VIDEO

Price Ceiling and Price Floor | Think Econ

Think Econ • 4:06

<https://www.youtube.com/watch?v=a2iKaTqgrxs>

After the project, to review both price ceilings and price floors.

KEY TERMS

equilibrium price

The price at which the quantity buyers want to buy equals the quantity sellers want to sell.

price ceiling

A legal maximum price. If it is set below the equilibrium price, it causes a shortage.

price floor

A legal minimum price. If it is set above the equilibrium price, it causes a surplus.

shortage

When the quantity demanded is greater than the quantity supplied at the going price: $\text{shortage} = \text{quantity demanded} - \text{quantity supplied}$.

rationing

Any way of deciding who gets a scarce good. Prices ration goods; so do lines, rules, drawing lots and favoritism.

CORE IDEAS

The story. On August 15, 1971, President Richard Nixon froze almost all prices and wages in the United States for ninety days, hoping to stop rising prices. Most of the controls were later lifted, but controls on the prices of oil and gasoline stayed in place, in one form or another, for most of the 1970s. Government rules also decided how much gasoline each region and each station would get. In 1979 unrest in Iran cut that country's oil exports, and the world price of oil jumped. In a free market, the price of gasoline would have risen quickly. Instead, controlled prices stayed lower than the market price, and the allocation rules were slow to send gasoline where it was needed. Across much of the country, especially in California and the big cities of the East, drivers waited in lines that stretched for blocks, sometimes for hours. Stations ran out by noon or closed on weekends.

How they figured it out. States tried rules to share the shortage. In “odd-even” rationing, a car whose license plate ended in an odd number could buy gas only on odd-numbered days, and an even plate on even days. Some stations set limits of ten gallons per car. But the lines remained, because the root of the problem remained: at the controlled price, people wanted to buy more gasoline than was being supplied to them. In January 1981 the federal price controls on oil and gasoline were ended.

Prices rose for a short time, the lines quickly disappeared, oil companies had a reason to find and bring more oil to market, and during the 1980s gasoline prices fell.

The big idea. At the **equilibrium price**, the quantity demanded equals the quantity supplied. A **price ceiling** set below it creates a **shortage**: $\text{shortage} = \text{quantity demanded} - \text{quantity supplied}$. Suppose at \$1.00 a gallon drivers want 120 million gallons a day but sellers bring only 80 million; the shortage is 40 million gallons. Since price can no longer do the **rationing**, something else must: waiting in line, rules, luck or favoritism. Waiting has a hidden cost. If a driver waits two hours to save 50¢ a gallon on 10 gallons, he saves \$5 but loses two hours, which is not much of a bargain for a worker who earns \$10 an hour. Price ceilings also tend to lower quality, because sellers cut corners when they cannot charge more. The opposite rule, a **price floor** set above equilibrium, creates a surplus: more is offered than buyers want.

Think it through. Price ceilings usually come from a kind wish: to protect people from high prices. But rules that ignore how markets work can hurt the very people they aim to help. The Roman emperor Diocletian's edict of AD 301 (Grade 5) emptied markets the same way, and so did the bread shortages of the Soviet Union. Good rules work with prices, not against them: they stop fraud and secret deals, and they help the truly needy directly, while letting prices tell everyone how scarce a thing really is.

In business today. When a storm or a sudden shortage drives prices up, a business faces a real moral choice. Charging a high price signals scarcity and draws in new supplies, but taking cruel advantage of people in an emergency breaks the command to love our neighbor. Many honest business owners limit how many each customer may buy, keep prices fair and work hard to bring in more goods. Scripture praises the one who sells grain in a famine rather than hoarding it: "blessing shall be upon the head of him that selleth it" (Proverbs 11:26).

PICTURE STUDY



Line at a Gas Station, June 15, 1979, Warren K. Leffler, U.S. News & World Report, 1979 · Photograph · Library of Congress, Washington, D.C.
Image: [Wikimedia Commons](#), public domain

This photograph was taken in Maryland on June 15, 1979, during the worst months of the gasoline shortage. It belongs to the *U.S. News & World Report* photograph collection, which the magazine gave to the Library of Congress.

Look closely

- Count as many cars as you can. How long do you think the drivers at the back will wait?
- Look for signs at the station. What might they say?
- Look at the drivers you can see. What else could they be doing with that time?

Talk about it

1. Why were there lines like this even though the price of gasoline was held down?
2. Who was helped by the low controlled price, and who was hurt by the shortage?
3. If you were a station owner in 1979, how would you decide fairly who got gas?

PROJECT

The Ceiling Game

Your family will play a small market three ways: a free market, a market with a price ceiling below equilibrium, and a market with a ceiling plus odd-even rationing. You will measure the shortage, the waiting and who ended up with the goods.

You will need

- Twelve small treats or tokens (the “gasoline”)
- Play money: \$10 for each of four buyers
- A timer, cards numbered 1–4 for “license plates,” and a ledger page

Steps

1. **Round 1, free market.** The seller offers 12 treats and sells to the highest bidders. Record each price and who bought. Find the average price. This is close to the equilibrium price.
2. **Round 2, price ceiling.** Set a ceiling of half the Round 1 average. Now the seller agrees to sell only 6 treats at that price (because it barely covers her cost). Ask each buyer how many treats he or she wants at the low price, and add them up. Record quantity demanded, quantity supplied and the shortage.
3. Sell the 6 treats first-come, first-served: buyers must stand in a line, and the seller serves one buyer every 30 seconds. Time how long each buyer waits.
4. **Round 3, odd-even rationing.** Give each buyer a “license plate” card (1–4). Only odd-numbered plates may buy on the first “day,” and even plates on the second. Sell 3 treats each day at the ceiling price. Record who got treats and who did not.
5. Make a table for the three rounds: Price, Quantity supplied, Quantity demanded, Shortage, Total minutes waited, Number of buyers who went without.
6. Calculate the value of the waiting time: if each minute in line is worth 10¢, how much did all the waiting cost in Round 2?

7. Write a paragraph: Which round was fairest? Which got the most goods to the people who wanted them most? What would you advise a lawmaker in 1979?

Tips

- The point is not that prices should always be high. It is that a price set too low by law does not create more goods; it only changes who gets them and how.
- Let the youngest player be the seller in one round so everyone sees both sides.

Check your work

- ☐ I can calculate a shortage from quantity demanded and quantity supplied.
- ☐ I can explain why a ceiling below equilibrium causes lines.
- ☐ I can name two hidden costs of a shortage.

LEDGER NOTEBOOK

1. Draw a supply and demand graph. Mark the equilibrium price, then draw a ceiling line below it and label the shortage between the curves.
2. Make a timeline: August 15, 1971 price and wage freeze; 1970s oil price controls; 1979 shortage and gas lines; January 1981 controls end.
3. Write a short diary entry by a mother waiting two hours in a gas line in 1979. What did it cost her besides money?
4. List three fair ways a store can share a scarce item in an emergency without a law setting the price.

From history. The odd-even system was not new in 1979. Several states had tried it during the oil embargo of 1973–1974, when some oil-exporting countries stopped sending oil to the United States. Both times, lines shortened only when more gasoline reached the stations.

COMMON MISTAKES

- Thinking a price ceiling makes goods cheaper for everyone. It makes them cheaper for those who get them, and unavailable for many who do not.
- Forgetting the cost of waiting. Time in line is a real cost, even if no money changes hands.
- Confusing a ceiling with a floor. A ceiling is a maximum price (causes shortages when too low); a floor is a minimum price (causes surpluses when too high).

Make it a game • Line Up at the Pump. Set out five buttons as gallons of gas and eight stuffed toys as drivers. Round one: an auction sets the price. Round two: you set a ceiling far below it, and the toys line up while the gas runs out. Say who gets gas and who waits. Explain the gas lines of 1979 and how they ended.

Scripture. “He that withholdeth corn, the people shall curse him: but blessing shall be upon the head of him that selleth it.” (Proverbs 11:26, KJV)

In a shortage, the person who brings goods to market serves his neighbors, and the one who hoards them to wait for a higher price is rightly blamed. Prices and rules should both help goods reach the people who need them.

3.4 NATURAL MONOPOLIES: EDISON'S PEARL STREET STATION AND THE UTILITY COMMISSION

OBJECTIVES

- Tell how Thomas Edison's Pearl Street Station began electric service in 1882.
- Explain what a natural monopoly is and calculate why one network costs less than two.
- Explain how a public utility commission sets rates, and name the strengths and weaknesses of regulation.
- Act as a utility commission and set a fair rate from a company's costs.

Warm-up. Look out your window at the street. Count the power poles, wires, fire hydrants or manhole covers you can see. Now imagine three different water companies, each digging its own pipes under your street. What would that be like? What would it cost?

WATCH

Y2 20) Natural Monopoly

[EconplusDal](https://www.youtube.com/watch?v=jmtUbKeDiuE) · 9:23

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

WHEN TO WATCH

After the big idea. Watch the first five minutes, where the falling average-cost curve is explained; the rest is for older students.

Note: A British economics teacher's lesson for students preparing for A-level exams, more advanced than this lesson. Watch with a parent and pause often.

BACKUP VIDEO

4th September 1882: Thomas Edison opens the world's first power plant

[HistoryPod](https://www.youtube.com/watch?v=BpqQcHDgEZY) · 2:48

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

With the story of Pearl Street.

KEY TERMS

natural monopoly

An industry in which one firm can serve the whole market at a lower cost than two or more firms could, usually because it needs an expensive network of pipes, wires or tracks.

average cost

Total cost divided by the number of units or customers served: average cost = total cost ÷ quantity.

utility commission

A government board that sets the prices a regulated utility may charge and checks its service and safety.

fixed costs

Costs that do not change with how much is produced, such as building a power plant or laying pipes.

public utility

A business that provides an essential service such as water, electricity or gas, usually as a regulated monopoly or a government department.

rate base

The value of a utility's plant and equipment on which the commission allows it to earn a fair return.

CORE IDEAS

The story. On September 4, 1882, Thomas Edison stood in the offices of the banker J. P. Morgan on Wall Street, whose firm had helped finance him. At three o'clock, workers at Edison's new power station on Pearl Street in lower Manhattan threw a switch, and electric lamps lit up in Morgan's office and in shops and offices across the surrounding blocks. Pearl Street was the first central power station in America to sell electricity to many customers through wires laid under the streets. Edison had to invent or improve nearly everything: the dynamos, the meters, the fuses, the switches and the underground cables. Within a few years, electric companies sprang up in cities across the country.

How they figured it out. At first, several companies often competed in the same city, each stringing its own wires along the streets. In some cities the poles and wires became a dangerous tangle. Building a power plant and a network of wires cost a great deal (a **fixed cost**), but adding one more customer to an existing line cost very little. So the bigger the network, the lower the **average cost** of serving each customer. Samuel Insull, who had been Edison's secretary and went on to run the

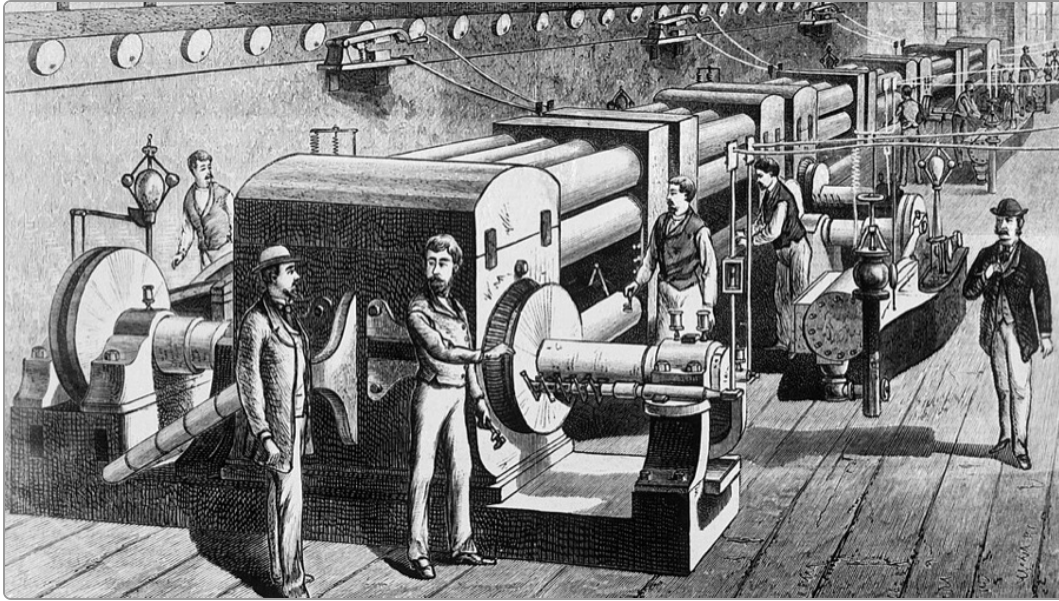
electric company in Chicago, argued in 1898 that electricity was cheapest when one company served a whole area, but that such a company should be regulated so it could not overcharge. In 1907 Wisconsin and New York set up commissions to regulate their utilities, and other states soon followed.

The big idea. A **natural monopoly** happens when one firm can serve the whole market more cheaply than two. Here is why, with numbers. Suppose building the wires for a town costs \$1,000,000 a year (fixed cost), plus \$10 a year per customer. With one company serving 10,000 customers, total cost = $\$1,000,000 + \$10 \times 10,000 = \$1,100,000$, and average cost = $\$1,100,000 \div 10,000 = \$110$ per customer. With two companies each building its own wires and serving 5,000 customers, each spends $\$1,000,000 + \$50,000 = \$1,050,000$, and average cost = $\$1,050,000 \div 5,000 = \$210$ per customer, almost twice as much. But a monopoly that is not checked can charge too much, so a **utility commission** sets its rates. A common rule is: allowed revenue = operating costs + a fair return on the **rate base** (the value of its plant). Many towns choose a different answer and own their water works themselves.

Think it through. Regulation solves one problem and can create others. Because a regulated utility earns a return on its plant, it may be tempted to build more than it needs; and because it has no rivals, it may be slow to cut costs or improve service. Commissions can also be slow, or too friendly with the companies they watch. Insull's own giant group of utility companies, built on borrowed money, collapsed in 1932, costing many investors their savings and leading to stricter rules. A fair referee must be honest, skilled and independent.

In business today. Your family's water, electricity and natural gas almost certainly come from a regulated utility or a city department, and the rates on your bill were approved by a commission or a town council after public hearings. Some parts of these industries, such as producing electricity, have been opened to competition in some places, while the wires and pipes remain regulated monopolies. Good rulers, Scripture says, "must be just" (2 Samuel 23:3), and so must those who set the prices of things every family needs.

PICTURE STUDY



Edison's Pearl Street Power Station, Unknown artist, 1880s · Print

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

This picture shows Edison's Pearl Street station, the first central power station in America to serve many paying customers. Inside, steam engines turned dynamos that sent electric current through cables under the streets of lower Manhattan.

Look closely

- Find the machines. Which ones make the power, and which ones drive them?
- Look for the workers. What jobs do you think they did?
- Look at the size of the machinery. What does it tell you about the fixed costs of starting an electric company?

Talk about it

1. Why would it make little sense for three companies to build stations like this and run three sets of cables to every street?
2. If one company served the whole city, what would stop it from charging whatever it liked?
3. Which stakeholders took the biggest risk in building Pearl Street: the financiers, Edison or the first customers?

PROJECT

Be the Utility Commission

You will compare the cost of one water network with two for your own street, and then act as a utility commission: you will review a water company's costs, set a fair rate, and decide what to do about a request to raise it.

You will need

- Graph paper, a ruler and a pencil
- Ledger notebook and calculator
- A parent to play the water company's manager

Steps

1. Draw a simple map of your street or block with each house as a square. Draw one water main down the street and a short pipe to each house.
2. Use these practice costs: water main \$200 per house-length of street; each house pipe \$50. Add up the cost of one network. Then draw a second company's network beside it for half the houses and add up both companies' costs together.
3. Find the average cost per house with one network and with two. How much more does every family pay, on average, with two?
4. **The hearing.** The water company (your parent) presents its yearly costs: operating costs \$40,000; plant and pipes (rate base) \$200,000. It serves 400 homes.
5. Set an allowed return of 8% on the rate base. Calculate: allowed revenue = operating costs + $8\% \times \text{rate base}$. Then the yearly rate per home = allowed revenue $\div$ 400.
6. **A request.** The company asks to raise rates 25% to build a new storage tank. Ask it at least three questions (Why now? What will it cost? What happens if you wait?). Decide: approve, approve part, or deny. Write your decision and reasons.
7. Write a paragraph: What makes a utility commission a fair referee? What could make it unfair, to customers or to the company?

Tips

- Allowed revenue = $\$40,000 + 0.08 \times \$200,000 = \$56,000$; $\$56,000 \div 400 = \$140$ per home per year. Check your answer against this.
- A fair commission protects customers from overcharging and also lets the company earn enough to keep the pipes safe. Both matter.

Check your work

- ☐ I can explain what makes a natural monopoly.
- ☐ I calculated average cost with one network and with two.
- ☐ I set a rate using costs plus a fair return and explained my decision.

LEDGER NOTEBOOK

1. Copy the electricity example (one company versus two) and draw a bar graph of the average costs.
2. Draw a graph of average cost falling as the number of customers rises. Label it “natural monopoly.”
3. Find your family’s water or electric bill (with a parent) and write down: the company or department, the price per unit and one fixed charge. Who approved the rates?
4. Make a timeline: 1882 Pearl Street; 1898 Insull’s argument for regulated monopoly; 1907 Wisconsin and New York commissions; 1932 the collapse of Insull’s companies.

From history. A fire in January 1890 badly damaged the Pearl Street station, but it was repaired and kept running until 1895. By then Edison’s company in New York had built larger stations, and the idea of a central power station had spread to cities all over the world.

COMMON MISTAKES

- Thinking every monopoly is a natural monopoly. Most monopolies exist because of barriers or bad behavior; a natural monopoly is one where a single network really is cheapest.
- Thinking regulation means the government sets any price it likes. A fair commission allows enough to cover costs and a reasonable return.
- Thinking regulated utilities face no risk. Poor management, bad weather or too much borrowing can still ruin them, as Insull’s companies showed.

Make it a game • One Wire or Two. Use yarn to connect three cup houses to a power cup. Measure the yarn as the fixed cost for one network, then lay down a second competing network and measure again. Divide the total by the number of customers to get average cost. Why is one network cheaper? Then set a fair rate, as a utility commission would.

Scripture. “He that ruleth over men must be just, ruling in the fear of God.” (2 Samuel 23:3, KJV)

Those who set the price of water and light for a whole town hold real power over every family. They are called to be just: fair to the customers who have no other choice and fair to the company that must keep the service running.

UNIT 3

MARKETS

A market is any place, or any way, that buyers and sellers meet to trade. In this unit you will go deeper into how markets work. You will draw a **demand curve** and measure **elasticity**, which tells how strongly buyers respond to a change in price, using the story of Rowland Hill's penny post, which cut the price of a letter and changed how a whole nation wrote to each other. You will learn the **four market structures**, from thousands of wheat farmers selling at the Chicago Board of Trade to a single water company, and weigh the strengths and limits of each.

Then you will study two places where markets need special care. When governments set a **price ceiling** below what the market would set, as American gasoline prices were held in the 1970s, the result is a shortage and long lines. And some services, like water pipes and power lines, are **natural monopolies**, which is why towns regulate them through utility commissions. Good markets need honest rules, and good rules respect how markets work.

PREREQUISITES

- Knows supply and demand, competition and monopoly simply (Grade 5, Unit 3)
- Can calculate a percent change
- Can plot points on a graph

MASTERY CHECKLIST

- ☐ I can draw a demand curve from a demand schedule and explain the law of demand.
- ☐ I can calculate price elasticity of demand and use the revenue test to tell elastic from inelastic demand.
- ☐ I can describe the four market structures and give the strengths and limits of each.
- ☐ I can explain why a price ceiling below the market price causes a shortage, using the gas lines of 1979.
- ☐ I can explain what a natural monopoly is and how a utility commission regulates it.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Khan Academy: Microeconomics**: Free. Short videos and practice problems on demand, elasticity, market structures and price controls. Written for high-school and college students; a strong sixth grader can try the elasticity practice with a parent after Lesson 3.1.
- **Catan (board game)**: A family trading game in which the value of wheat, wood, brick, ore and wool rises and falls with scarcity. After a game, talk about which resources were in short supply and how that changed the trades people would accept. Ages 10 and up. Optional.

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 Demand Curves and Elasticity: Rowland Hill's Penny Post

2 sessions of 50 minutes

3.2 The Four Market Structures

2 sessions of 50 minutes

3.3 Price Ceilings and Shortages: The Gas Lines of 1979

2 sessions of 50 minutes

3.4 Natural Monopolies: Edison's Pearl Street Station and the Utility Commission

2 sessions of 50 minutes

UNIT 3 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. **8 pts**

State the law of demand. Why does a demand curve slope down?

2. 10 pts

A bakery cuts the price of a muffin from \$2.00 to \$1.50 and its sales rise from 100 to 150 muffins a day. Calculate the elasticity of demand and the total revenue before and after. Is demand elastic or inelastic?

3. 8 pts

After the penny post began in 1840, letters more than doubled, but the Post Office's income fell. What does this tell you about the elasticity of demand for letters at that time?

4. 6 pts

Give one good with elastic demand and one with inelastic demand, and explain why.

5. 10 pts

Name the four market structures and give one example of each.

6. 8 pts

How did the Chicago Board of Trade's grading of wheat in 1856 make the wheat market more competitive?

7. 8 pts

Give one strength and one limit of an oligopoly.

8. 10 pts

At a price ceiling of \$3 a ticket, 900 people want concert tickets but only 500 seats are offered. What is the shortage? Name two ways the tickets might end up being rationed.

9. 8 pts

Why were there long gas lines in 1979, and what happened after price controls ended in 1981?

10. 10 pts

A gas company's network costs \$600,000 a year plus \$20 per customer. Find the average cost per customer if one company serves 6,000 customers, and if two companies each serve 3,000.

11. **6 pts**

A utility has operating costs of \$30,000, a rate base of \$100,000 and an allowed return of 10%. What revenue should the commission allow?

12. **8 pts**

Short answer: Explain why markets need honest rules, but why rules that ignore prices can hurt the people they aim to help. Use one example from this unit.

ANSWER KEY

1. When the price of a good rises, buyers buy less; when it falls, they buy more, other things staying the same. The curve slopes down because at lower prices people buy more.
2. Price change = $(2.00 - 1.50) \div 2.00 = 25\%$. Quantity change = $(150 - 100) \div 100 = 50\%$. Elasticity = $50 \div 25 = 2$, so demand is elastic. Revenue before = $\$2.00 \times 100 = \$200$; after = $\$1.50 \times 150 = \$225$. Revenue rose, as the revenue test predicts for elastic demand.
3. People responded to the lower price, but not enough to make up for the huge drop in price, so revenue fell. By the revenue test, demand was inelastic over that price change.
4. Elastic: one brand of cereal, because there are many substitutes. Inelastic: salt or a needed medicine, because there are few substitutes and it is a need. (Accept other reasonable examples.)
5. Perfect competition (wheat farmers); monopolistic competition (restaurants or bakeries); oligopoly (airlines or automobile makers); monopoly (the local water company).
6. Grading made wheat of the same grade identical, so it could be mixed in elevators and traded by receipt. Thousands of farmers sold a uniform product, and no single seller could set the price.
7. Strength: large firms can build big factories or networks and lower costs. Limit: a few sellers may be tempted to stop competing and agree to keep prices high (a cartel).
8. Shortage = $900 - 500 = 400$ tickets. Rationing could happen by waiting in line, first come first served, drawing names, favoritism, or illegal resale at higher prices (any two).
9. Controlled prices were held below the market price after oil supplies fell, so more gasoline was demanded than supplied at stations, and allocation rules were slow. After controls ended, prices rose briefly, the lines disappeared, more oil was brought to market and prices fell during the 1980s.
10. One company: $(\$600,000 + \$20 \times 6,000) \div 6,000 = \$720,000 \div 6,000 = \$120$. Two companies: each $(\$600,000 + \$20 \times 3,000) \div 3,000 = \$660,000 \div 3,000 = \$220$. One network is much cheaper per customer.
11. Allowed revenue = $\$30,000 + 0.10 \times \$100,000 = \$30,000 + \$10,000 = \$40,000$.

12. Rules against fraud, secret price-fixing and overcharging by monopolies keep markets fair and open. But rules that set prices below what the market would set, like the gasoline price controls of the 1970s, create shortages, lines and waste, which hurt the very drivers they were meant to protect. Good rules act like a fair referee. (Accept any clear answer with an accurate example.)

PORTFOLIO PIECE: A LOCAL MARKET REPORT

Choose one product your family buys often (bread, eggs, gasoline, haircuts or another). With a parent, find its price at three sellers and, if possible, at two times a month apart. Write a one-to-two-page report with four headings: The market (its structure, with reasons), The prices (a table, a bar graph and the percent difference between the cheapest and dearest seller), The buyers (is demand elastic or inelastic, and why?), and The rules (who regulates this market, if anyone, and what honest rules protect buyers and sellers). End with a paragraph of advice for a new seller who wants to enter this market.

LOOK FOR	WHAT IT MEANS
Research	Real prices from at least three sellers, with dates, in a labeled table and graph.
Economic reasoning	Correctly identifies the market structure and the elasticity of demand, with reasons.
Calculations	Percent differences and changes are correct, with formulas and units shown.
Judgment and presentation	Thoughtful advice and a fair discussion of rules, in clear, complete sentences.

GREAT BUSINESSES AND THEIR STAKEHOLDERS

A business is great when it creates real value and serves all of its **six stakeholders** over a long time: the **financiers** who lend or invest the money, the **risk-takers** who found and own it, the **builders** who design and make its products, the **workers**, the **customers** and the **community**. A business may be big without being great. In this unit you will weigh four famous businesses with an honest **stakeholder scorecard**: a rating from 1 to 5 and a reason for each of the six.

You will study the Hudson's Bay Company, chartered in 1670 and for centuries the great fur trader of North America; Matthew Boulton and James Watt, who built and sold the steam engines that powered the factory age; the Cadbury family, Quaker chocolate makers who built a factory in a garden at Bournville; and Toyota, whose production system taught the world to stop the line, fix the problem and waste nothing. Each did great good, and each fell short somewhere. You will finish by writing a stakeholder report on a business of your own choosing.

PREREQUISITES

- Knows the six stakeholders and how to give a scorecard (Grade 5, Unit 4)
- Knows productivity, the factory system and comparative advantage (Unit 1)
- Can find an average and work with percents

MASTERY CHECKLIST

- ☐ I can name the six stakeholders and give a fair 1–5 scorecard with reasons for a business.
- ☐ I can tell the story of the Hudson's Bay Company and explain the Made Beaver as a unit of account.
- ☐ I can explain how Boulton & Watt sold engines by giving customers part of the savings they made, and how the partnership served and failed its stakeholders.
- ☐ I can tell how the Cadburys built Bournville and weigh both their care for workers and their failure over cocoa grown by forced labor.
- ☐ I can explain just-in-time, kanban and stopping the line in the Toyota Production System.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Soho House (Birmingham Museums)**: Free to read online. The home of Matthew Boulton, where the Lunar Society of inventors and thinkers met. Pictures and history for Lesson 4.2.
- **Bournville Village Trust**: Free. The trust George Cadbury founded in 1900 still manages the village of Bournville. Its website has history and photographs for Lesson 4.3.
- **Toyota Production System (Toyota Motor Corporation)**: Free. Toyota's own short explanation of just-in-time and jidoka, with diagrams. Read with Lesson 4.4. Ages 11 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

4.1 The Hudson's Bay Company: Three Centuries of Trade	2 sessions of 50 minutes
4.2 Boulton & Watt: Selling Power	2 sessions of 50 minutes
4.3 Cadbury's Bournville: A Factory in a Garden	2 sessions of 50 minutes
4.4 Toyota's Production System: Stop the Line, Fix the Problem	2 sessions of 50 minutes

UNIT 4 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. **8 pts**

Name the six stakeholders of a business and say in a few words what each one puts in.

2. (8 pts)

What was the Hudson's Bay Company's charter of 1670, and why was it a monopoly?

3. (10 pts)

A trapper brings 6 beaver (1 MB each), 2 otter (2 MB each) and 6 martens (3 martens = 1 MB). How many Made Beaver are his furs worth? Can he buy a kettle (6 MB) and a blanket (7 MB)?

4. (8 pts)

Give one way the Hudson's Bay Company served the First Nations trappers and one way it fell short.

5. (8 pts)

What was James Watt's separate condenser, and why did it save fuel?

6. (10 pts)

An old engine burned \$2,400 of coal a year; a Watt engine doing the same work burns \$900. Calculate the saving, the royalty at one-third of the saving, and what the owner keeps.

7. (8 pts)

What did Matthew Boulton bring to the partnership that James Watt lacked?

8. (8 pts)

Name three things the Cadburys provided for workers at Bournville, and explain why they did so.

9. (8 pts)

Why did the jury award Cadbury only one farthing in its 1909 libel case?

10. (8 pts)

Explain kanban and jidoka in the Toyota Production System.

11. (6 pts)

A batch of 20 parts is made before anyone checks them, and a machine setting was wrong from the start. In one-piece flow the mistake would be found on the first part. How many parts are saved from rework? What percent is that?

12. **10 pts**

Short answer: Explain why a business can be big without being great. Use one of the four businesses in this unit as an example.

ANSWER KEY

1. Financiers (money lent or invested); risk-takers (their savings, time and reputation as founders and owners); builders (designs, skill and systems); workers (time, labor and skill); customers (money paid for products); community (roads, services, neighbors and trust).
2. A royal grant from King Charles II creating the company and giving it the sole right to trade in all lands draining into Hudson Bay (Rupert's Land). It was a monopoly because no other English traders were allowed to trade there.
3. Beaver $6 \times 1 = 6$ MB; otter $2 \times 2 = 4$ MB; martens $6 \div 3 = 2$ MB. Total = 12 MB. A kettle and a blanket cost 13 MB, so he is 1 MB short; he could buy the blanket and a knife, or the kettle and other goods.
4. Served: offered useful goods (kettles, blankets, knives) in trade and long, mostly peaceful trading relationships. Fell short (any one): dependence on European goods, diseases, over-trapping, and a charter that gave rule over their lands without asking them.
5. A chamber apart from the cylinder where the steam was cooled, so the cylinder could stay hot. The old engine heated and cooled its cylinder every stroke, wasting coal; Watt's engine did not.
6. Saving = $\$2,400 - \$900 = \$1,500$. Royalty = $\frac{1}{3} \times \$1,500 = \$500$. Owner keeps $\$1,500 - \$500 = \$1,000$ a year.
7. Money and the willingness to borrow and risk it, a large factory (Soho) and skilled workers, business sense and salesmanship.
8. Any three: good houses with gardens, sports fields, parks, a dining hall, classes, doctors and dentists, a pension fund. As Quaker Christians they believed workers were made in God's image and deserved decent lives; healthy, settled workers were also productive.
9. Cadbury won, because it was not a hypocrite in the way the newspaper claimed, but the tiny award showed that many thought the firm had been too slow to stop buying cocoa grown by forced labor on São Tomé.
10. Kanban: a card or signal that tells an earlier step to make or send more parts only when a later step has used them, so nothing is overproduced. Jidoka: stopping the line (by machine or worker) as soon as a problem appears, so the cause is fixed and defects do not multiply.
11. In the batch, all 20 are bad; in flow, only 1 is. 19 parts are saved, which is $19 \div 20 \times 100 = 95\%$.

12. Size measures sales or wealth; greatness means creating real value and serving all six stakeholders over a long time. For example, Cadbury grew large and served its Bournville workers and customers very well, but its supply-chain workers on São Tomé were treated unjustly for years; or the Hudson's Bay Company was huge and lasted centuries, but served the First Nations trappers less well than its shareholders. (Accept any well-supported example.)

PORTFOLIO PIECE: A STAKEHOLDER REPORT ON A BUSINESS OF YOUR CHOICE

Choose a business to study: a family business, a local company you can visit with a parent, or a historical company. Gather facts from an interview (with a parent present), the company's own website, a museum or a library book. Write a two-page report with a short history, a section for each of the six stakeholders (what each puts in, what each gets, and a rating from 1 to 5 with a reason), a bar graph of the six ratings, and a conclusion: Is this business great, good or only big? What one change would make it better for its weakest stakeholder? List your sources at the end.

LOOK FOR	WHAT IT MEANS
Research	Uses at least two reliable sources (one may be an interview) and lists them; facts are accurate.
Fair scorecard	Gives a rating and a specific reason for each of the six stakeholders, including strengths and weaknesses.
Reasoning	The conclusion follows from the evidence and the suggested change is practical.
Presentation	Clear headings, a labeled bar graph, neat work and complete sentences.

4.1 THE HUDSON'S BAY COMPANY: THREE CENTURIES OF TRADE

OBJECTIVES

- Tell how the Hudson's Bay Company was founded in 1670 and how its trading posts worked.
- Explain the Made Beaver as a unit of account and calculate prices with it.
- Give the company an honest stakeholder scorecard, including the First Nations trappers who traded with it.
- Explain why even a very old company must keep serving its customers to survive.

Warm-up. Name the oldest business you know of in your town. How long has it been open? Why do you think it has lasted when other shops have closed? Write three reasons.

WATCH

The Hudson Bay Company | True North History

True North History · 4:30

<https://www.youtube.com/watch?v=A7pSRU9aj2A>

WHEN TO WATCH

After the story, before the scorecard.

Note: A short video made to go with a history unit for students, from True North History.

BACKUP VIDEO

From Furs to Fortune: The Rise and Rise of Hudson's Bay Company

Business Casual · 8:07

<https://www.youtube.com/watch?v=JX4Xv6Ty3vk>

After the lesson, for a longer history of the company up to the department-store years.

KEY TERMS

charter

A written grant from a ruler or government giving a company the right to exist and to do certain things, sometimes with special rights.

trading post

A station where traders exchanged goods with people of the surrounding region; the Hudson's Bay Company called its larger posts "factories," after the factors (agents) who ran them.

Made Beaver

The Hudson's Bay Company's unit of account: the value of one prime beaver pelt, in which the prices of all furs and trade goods were stated.

shareholder

A part-owner of a company who has bought shares and may receive part of its profits as dividends.

merger

When two companies join to become one.

CORE IDEAS

The story. In the 1660s two French fur traders, Pierre-Esprit Radisson and Médard Chouart des Groseilliers, believed that the best furs in North America could be reached by sea through Hudson Bay, far to the north. The French authorities would not back them, so they went to England. A group of English investors, led by Prince Rupert, the cousin of King Charles II, paid for a voyage. In 1668 the small ship *Nonsuch* sailed into Hudson Bay and came home the next year loaded with beaver pelts. On May 2, 1670, the King granted a **charter** to "the Governor and Company of Adventurers of England trading into Hudson's Bay," with the sole right to trade in all the lands whose rivers drained into the bay, a territory larger than western Europe that was named Rupert's Land.

How they figured it out. The company built **trading posts**, such as York Factory, on the shores of the bay. Each summer, Cree and other First Nations trappers paddled down the rivers with furs, and the company's ships brought trade goods from England: wool cloth, metal kettles, knives, needles, beads and blankets. Prices were set in the **Made Beaver**, the value of one prime beaver pelt. A trader might list a kettle at so many Made Beaver, a blanket at so many more, and a marten or fox skin

as worth a fraction or a multiple of a Made Beaver. Beaver fur was prized in Europe for making felt hats. In 1779 a rival, the North West Company of Montreal, began sending traders inland to meet trappers before they reached the bay. The two companies competed fiercely for forty years until they **merged** in 1821. In 1870 the Hudson's Bay Company handed Rupert's Land over to the new country of Canada for £300,000 and some land, and in the next century it became one of Canada's best-known chains of department stores.

The big idea. A company can last only if it keeps creating value that people will pay for. The Hudson's Bay Company traded furs for 200 years, then land, then department-store goods. It also shows that a charter granting one company the sole right to trade is a **monopoly**, and that monopolies invite rivals and resentment. The Made Beaver also shows money's job as a **unit of account** (Unit 2): even with no coins, everyone could compare the values of very different goods.

Stakeholder scorecard: the Hudson's Bay Company, 1670–1870. *Financiers (shareholders in London):* 4. Long periods of good dividends, with lean years during wars and rivalry. *Risk-takers (Radisson, Groseilliers, Prince Rupert's group):* 4. A daring venture that paid off, though Radisson and Groseilliers quarreled with the company and changed sides more than once. *Builders (factors, ship captains, boat-builders, mapmakers):* 4. They built posts, boats and supply routes that worked for centuries in a hard land, and mapped much of northern Canada. *Workers (company servants, many from the Orkney Islands of Scotland):* 3. Steady pay and food, but long, isolated years in bitter cold under strict rules. *Customers and suppliers (First Nations trappers):* 3. They bargained skillfully and gained useful goods, but the trade also brought dependence on European goods, diseases to which they had no resistance, and a charter that gave away rule over their lands without asking them. *Community:* 3. The company laid the groundwork of much of Canada's economy and kept its trade peaceful for long periods, but heavy trapping drove the beaver close to disappearing in many areas until the company set limits in the 1800s. Overall, a durable and important business, but not equally good to all six.

In business today. For more than three centuries, the Hudson's Bay Company was famous as one of the oldest companies in the world. But age alone cannot keep a business alive. As shoppers moved to other stores and online sellers, it lost money for years, and in 2025 it closed its stores. A business stays great only as long as it

keeps serving its customers well. As Proverbs 27:23 says, “Be thou diligent to know the state of thy flocks, and look well to thy herds.”

The Standard of Trade at York Factory, 1715, Hudson's Bay Company record, under Governor James Knight, 1714–1715 · Handwritten ledger page
Image: Wikimedia Commons, public domain

This page from the Hudson's Bay Company's records lists the skins traded at York Factory between September 1714 and August 1715, and the "standard of trade" set by the governor, James Knight: the prices of goods and furs in Made Beaver. It is a real business document, the price list and the sales record of a trading post three hundred years ago.

- Find the columns. What kinds of information did the clerk record?
- Look for numbers. Can you find any totals?
- Look at the handwriting and spelling. How is it different from writing today?
- Find any names of furs you recognize.

1. Why would a trading company need a written standard of trade?
2. How does this page show money's job as a unit of account, even though no coins were used?
3. If you were a Cree trapper bringing furs to York Factory, what would you want to know before you traded?

PROJECT

The York Factory Trading Post

You will run a trading post using the Made Beaver as your unit of account, keep a trade ledger, and then add a rival trader to see how competition changes the terms of trade. Last, you will write your own stakeholder scorecard.

You will need

- Index cards cut into “furs” (beaver, marten, fox, otter) and “trade goods” (kettle, blanket, knife, beads)
- A price list card in Made Beaver (MB)
- Ledger notebook with columns: Date, Trapper, Furs received, Value in MB, Goods given, Value in MB, Balance
- Two or three family members as trappers and, later, a rival trader

Steps

1. Make your standard of trade. Practice prices: 1 beaver = 1 MB; 1 otter = 2 MB; 1 fox = $\frac{1}{2}$ MB; 3 martens = 1 MB. Goods: kettle = 6 MB; blanket = 7 MB; knife = 1 MB; a string of beads = 2 MB.
2. Give each trapper a bundle of fur cards. Each trapper comes to the post, and the factor (you) totals the furs in MB and lets the trapper choose goods of equal value. Record every trade in the ledger.
3. After three trades, check that each line balances: MB received = MB given.
4. **A rival arrives.** A family member opens a “North West Company” post across the room and may offer better prices. Trappers can go to either post.
5. Run five more trades. Record the prices each post offered and where each trapper went.
6. Make a table comparing the average price of a blanket (in MB) before and after the rival arrived. What happened, and why?
7. Write a stakeholder scorecard for your trading post: a rating from 1 to 5 and a reason for each of the six stakeholders. Would the trappers rate you the same way you rate yourself?

Tips

- Fractions of a Made Beaver are fine; write $\frac{1}{2}$ MB or 0.5 MB.
- A good factor is honest and keeps his word, because trappers who are cheated will not come back next summer.

Check your work

- ☐ I can use the Made Beaver as a unit of account and balance a trade ledger.
- ☐ I can explain how a rival changed the terms of trade.
- ☐ I wrote a stakeholder scorecard with a rating and a reason for each of the six.

LEDGER NOTEBOOK

1. Draw a map of Hudson Bay with York Factory, Moose Factory and the rivers flowing into the bay. Shade Rupert's Land.
2. Make a timeline: 1668 *Nonsuch*; May 2, 1670 charter; 1715 standard of trade at York Factory; 1779 North West Company; 1821 merger; 1870 Rupert's Land handed to Canada; 2025 the stores close.
3. Copy the Hudson's Bay Company scorecard as a bar graph with six bars, and add one sentence on which stakeholder you think deserved better.
4. Draw a felt hat and a beaver pelt, and label how a pelt from Hudson Bay became a hat in London.

From history. Many of the Hudson's Bay Company's workers came from the Orkney Islands, north of Scotland, because the company's ships stopped there on the way to Hudson Bay and the islanders were used to cold, the sea and hard work. Some served for many years at the bay and sent their wages home to their families.

COMMON MISTAKES

- Thinking the trappers were helpless. Cree and other First Nations traders were skilled bargainers who chose what goods they wanted and often played rival traders against each other.
- Thinking a monopoly charter means no competition. Rivals like the North West Company found ways to compete anyway.
- Thinking the oldest company must be a great company. Age shows durability; greatness depends on serving all six stakeholders.

Make it a game • York Factory Counter. Make a price list in Made Beaver: a knife costs two, a blanket six, a kettle eight. Your parent brings pretend furs, valued in beavers. You trade, work out totals aloud and make change, beating a ninety-second timer for five trades. Then explain how the Made Beaver worked as a unit of account.

4.2 BOULTON & WATT: SELLING POWER

OBJECTIVES

- Tell how James Watt improved the steam engine and how Matthew Boulton built and sold it.
- Explain how Boulton & Watt charged customers a share of the fuel they saved, and calculate a royalty.
- Give the partnership a stakeholder scorecard, including its use of patents against rivals.
- Explain how a partnership can join a builder's skill with a risk-taker's money and salesmanship.

Warm-up. Name a machine in your house that saves you work: a washing machine, a dishwasher, a lawn mower. If a company offered you a new one that used half as much electricity, how would you decide whether it was worth buying? List the numbers you would want to know.

WATCH

Horsepower: James Watt and the Transition from Horse to Steam

The History Guy: History Deserves to Be Remembered • 12:05

<https://www.youtube.com/watch?v=3apcSyFUEOs>

WHEN TO WATCH

After the story, before the scorecard.

Note: The History Guy is an established history teaching channel. Stop the video when the teaching ends; it may close with a sponsor message.

BACKUP VIDEO

James Watt's Steam Engine

Inspire Education • 2:37

<https://www.youtube.com/watch?v=IFHEuwm3hrM>

With “How they figured it out,” for an animated look at the separate condenser.

KEY TERMS

separate condenser

Watt's invention of 1765: a chamber apart from the engine's cylinder where steam was cooled, so the cylinder could stay hot and the engine wasted far less fuel.

horsepower

Watt's unit for measuring an engine's power by comparing it with the work of a horse.

bankruptcy

When a person or business cannot pay its debts and a court divides what is left among the people owed.

royalty

A payment to the owner of a patent or other right for each use of it, often a share of the money it earns or saves.

salesmanship

The skill of understanding what customers need and honestly persuading them that a product will meet it.

CORE IDEAS

The story. In 1763 James Watt, an instrument maker at the University of Glasgow in Scotland, was asked to repair a small model of a Newcomen steam engine, the kind used to pump water out of mines. He noticed how much coal it wasted: every stroke, the cylinder was heated by steam and then cooled with cold water. In 1765, on a walk across Glasgow Green, the solution came to him: cool the steam in a **separate condenser**, so the cylinder could stay hot. Watt patented the idea in 1769. His first partner, John Roebuck, ran out of money and went into **bankruptcy** in 1773. Matthew Boulton, a wealthy Birmingham maker of buttons, buckles and fine metal goods, who owned the great Soho Manufactory, took over Roebuck's share. In 1775 Boulton and Watt became partners, and Parliament extended Watt's patent to 1800.

How they figured it out. Building a reliable engine was hard. The cylinder had to be bored perfectly round, which the ironmaster John Wilkinson's new boring machine made possible. Then came the problem of selling it. Engines were very costly, and mine owners did not trust a new machine. So Boulton & Watt made an offer: they would charge a **royalty** of one-third of the money the customer saved on coal

compared with an old Newcomen engine doing the same work, paid every year. If the engine saved nothing, the customer paid nothing. Customers in Cornwall's tin and copper mines, where coal was costly, bought engines eagerly. Watt then made engines that turned wheels, so they could drive mills and factories, and invented the **horsepower** to describe their power to customers who knew horses. Boulton told a visitor to Soho in 1776, "I sell here, Sir, what all the world desires to have—Power."

The big idea. The partnership joined a **builder**, Watt, a brilliant but anxious inventor, with a **risk-taker**, Boulton, who had the factory, the money, the courage to borrow and the gift of **salesmanship**. Their royalty plan shared the risk with the customer and tied the price to real value. Here is an example with practice numbers: if an old engine burned \$1,200 worth of coal a year and a Watt engine doing the same work burned \$400, the saving is \$800, and the royalty is $\frac{1}{3} \times \$800 \approx \$267$ a year. The customer still keeps about \$533 of the saving.

Stakeholder scorecard: Boulton & Watt, 1775–1800. *Financiers (Boulton's lenders and Roebuck):* 3. Roebuck lost everything; Boulton's bankers waited years, and the firm was deep in debt until the 1780s, but they were repaid in the end. *Risk-takers (Boulton):* 4. He nearly ruined himself, then grew rich and famous. *Builders (Watt, William Murdoch and the engine erectors):* 5. Some of the finest engineering of the age. *Workers (Soho's craftsmen):* 4. Skilled work, and Boulton started a sick club at Soho, an early kind of insurance paid for by small payments from wages, but the hours were long. *Customers (mine and mill owners):* 4. Huge savings in fuel, though many Cornish owners came to resent paying royalties year after year. *Community:* 3. Steam power drove the factory age and created many jobs, but the partners used their patent in court to stop rival inventors, and some historians think this slowed the development of better engines until the patent ran out in 1800. A great business, with a mixed record toward its competitors and customers.

In business today. Companies still share savings with customers, for example when an energy company is paid from the electricity a new system saves. Patents still reward inventors, as the U.S. Constitution intends, and still raise the question of when protecting an invention turns into blocking others. A good partnership, like Boulton's and Watt's, gives each partner the work he does best.

PICTURE STUDY



View of the Soho Manufactory near Birmingham, Unknown engraver, late 18th century · Engraving

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

Matthew Boulton's Soho Manufactory, built in the 1760s at Handsworth near Birmingham, was one of the largest and most admired factories in Europe. Visitors came from many countries to see it. Boulton designed its front to look like a fine country house, so that it would impress customers as well as house workshops.

Look closely

- Find the main building. Why might Boulton want his factory to look like a mansion?
- Find the water. What might a factory of the 1760s use it for?
- Look for people, carts or horses. What are they doing?

Talk about it

1. How might a building like this help Boulton sell his goods and engines?
2. Which of the six stakeholders would have spent the most hours in this building? What would you want to know about their work?
3. How is this picture different from Wright of Derby's painting of Arkwright's mills at night (Lesson 1.2)?

PROJECT

Sell an Engine the Boulton & Watt Way

You will calculate the savings and royalty for three customers, then design a “share the savings” offer for a modern product your family uses, and write a stakeholder scorecard for Boulton & Watt.

You will need

- Ledger notebook and calculator
- A household energy bill or the energy label from an appliance (with a parent)

Steps

1. Use these practice numbers for three mines. Mine A: old engine burns \$1,500 of coal a year; Watt engine, \$500. Mine B: old \$900; Watt \$400. Mine C: old \$600; Watt \$450.
2. For each mine, calculate the yearly saving, the royalty ($\frac{1}{3}$ of the saving) and what the owner keeps.
3. Which mine benefits most? Which owner might be least willing to buy? Why?
4. If each engine costs the partnership \$1,000 to build and install, and the patent runs 20 more years, how much royalty would each mine pay in total? Is each sale profitable for Boulton & Watt?
5. **A modern offer.** Choose an appliance in your home. With a parent, find out (or estimate) its yearly energy cost. Imagine a new model that uses 40% less. Calculate the saving and design a fair offer in which the customer pays a share of the saving instead of a price up front.
6. Write two sentences of honest sales pitch for your offer, without exaggerating.
7. Write your own stakeholder scorecard for Boulton & Watt with ratings and reasons. Do you agree with the lesson’s scores?

Tips

- Round the royalty to the nearest dollar and show the fraction you used: $\frac{1}{3} \times$ saving.

- A fair offer must leave the customer clearly better off; otherwise it is not really a fair split.

Check your work

- ☐ I can calculate a saving and a royalty.
- ☐ I can explain why splitting the savings helped Boulton & Watt sell a new machine.
- ☐ I wrote a stakeholder scorecard with reasons for each rating.

LEDGER NOTEBOOK

1. Draw a simple diagram of a Watt engine: boiler, cylinder, separate condenser, beam and pump. Label where the steam goes and where it is cooled.
2. Make a table for the three mines: Old coal cost, Watt coal cost, Saving, Royalty, Owner keeps.
3. Make a timeline: 1763 Watt repairs the model; 1765 separate condenser; 1769 patent; 1773 Roebuck bankrupt; 1775 partnership and patent extension; 1776 “I sell here ... Power”; 1800 patent expires.
4. Write one sentence describing what each partner gave that the other lacked.

From history. Boulton also used steam power to make coins. His Soho Mint, opened in 1788, made coins so evenly and quickly that in 1797 the British government hired him to make millions of large copper pennies, nicknamed “cartwheels” for their size and their thick raised rims, which made them hard to forge.

COMMON MISTAKES

- Thinking Watt invented the steam engine. Newcomen engines had been pumping mines for decades; Watt made the engine far more efficient and useful.
- Thinking a good invention sells itself. Boulton’s salesmanship and the royalty plan were as important as Watt’s condenser.
- Thinking patents are always good or always bad. They reward inventors, but can be used to block others.

Make it a game • Sell the Savings. Sell your parent a paper steam engine. Explain how James Watt’s separate condenser saved fuel, then calculate the royalty: a customer saves 30 pretend coins of coal a year, and you charge one-third. Do five different problems before your parent can yell bankruptcy. Swap roles and see who is the better salesman.

Scripture. “Two are better than one; because they have a good reward for their labour.” (Ecclesiastes 4:9, KJV)

Watt alone might have given up; Boulton alone had nothing new to sell. Together they had a good reward for their labor. A good partnership joins different gifts for a shared purpose.

4.3 CADBURY'S BOURNVILLE: A FACTORY IN A GARDEN

OBJECTIVES

- Tell how John Cadbury's sons, Richard and George, rescued the family business with pure cocoa and built the Bournville factory and village.
- Describe what the Cadburys provided for their workers and why, as Quaker Christians, they did so.
- Weigh honestly the Cadburys' slow response to reports of forced labor on the cocoa farms that supplied them.
- Give the business a stakeholder scorecard and compare it with another business.

Warm-up. Look at the label of a chocolate bar or a box of cocoa in your kitchen. List the ingredients. Do you know where the cocoa came from, or who grew it? How could you find out? Why might it matter?

WATCH

The Bournville Story

Bournville Village Trust • 1:56

<https://www.youtube.com/watch?v=v5pJHIYYHbw>

WHEN TO WATCH

After the story, before the scorecard.

Note: From the trust George Cadbury founded in 1900; its heritage manager tells how the Cadburys' Quaker faith shaped Bournville. Watch the backup film too.

BACKUP VIDEO

Cadbury's Bournville factory, 1930's. Archive film 96940

HuntleyFilmArchives • 4:36

<https://www.youtube.com/watch?v=E-TFtaa8T88>

After the main video, to see real film of the factory at work in the 1930s.

KEY TERMS

adulteration

Secretly mixing cheaper or harmful substances into food or drink to stretch it and increase profit.

model village

A planned village built by an employer or a trust, with good houses, gardens and shared spaces, meant to give working families a healthy place to live.

pension

Regular payments to a worker after he or she retires, paid from a fund built up during working years.

supply chain

All the steps and businesses that bring a product from raw materials to the customer.

Quakers

A Christian group, also called the Society of Friends, known for plain living, honesty in trade and work for reform.

CORE IDEAS

The story. In 1824 John Cadbury, a young Quaker, opened a shop in Birmingham, England, selling tea, coffee and cocoa, and soon began making cocoa and drinking chocolate. Quakers were known for honest dealing, fixed prices and plain living, and many became successful merchants. But by 1861, when John's sons Richard and George took over, the business was losing money and close to failing. The brothers worked long hours, lived simply and put everything into the firm. In 1866 they began making a new product, Cadbury's Cocoa Essence, using a press from Holland that squeezed out much of the cocoa butter. It was pure cocoa, and they advertised it as "Absolutely Pure, Therefore Best."

How they figured it out. In Victorian England, much cocoa was stretched with starch, flour and worse; this **adulteration** cheated customers and sometimes harmed them. The Cadburys made purity their selling point and supported the new laws against food adulteration in the 1870s. As the business grew, their crowded city works was no longer enough. In 1879 they built a new factory four miles outside Birmingham, beside a stream called the Bourn, and named the place Bournville.

They called it “the factory in a garden.” Workers had sports fields, gardens, a dining hall, morning prayers and Bible readings, classes, doctors and dentists, and in time a **pension** fund (begun in 1906). From the 1890s George Cadbury built a **model village** of well-built cottages with gardens and parks, and in 1900 he gave it to a trust so it would serve families for good, whether or not they worked for Cadbury. As **Quakers**, the Cadburys believed that workers were made in God’s image and should live in decent homes, not in crowded slums.

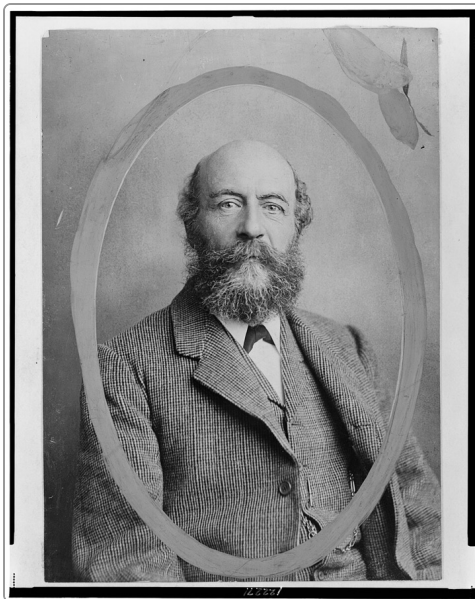
The big idea. The Cadburys showed that a company could make a good product, earn strong profits and care for its workers and community at the same time. Healthy, settled, well-trained workers were also good workers. But their story also shows how hard it is to see the whole **supply chain**. Much of their cocoa came from the islands of São Tomé and Príncipe, then ruled by Portugal. From about 1901 the Cadburys heard reports that the plantations there used forced labor: workers taken from the African mainland under false contracts and never allowed to return home. William Cadbury visited Portugal and sent an investigator, and the firm pressed the Portuguese government to end the practice. But it kept buying the cocoa for several years while it tried to persuade, and only stopped in 1909. A London newspaper accused the firm of hypocrisy. The Cadburys sued for libel and won, but the jury awarded them just one farthing, the smallest coin, a sign that many thought they had been too slow.

Stakeholder scorecard: Cadbury, about 1910. *Financiers (the family, who reinvested profits):* 5. A growing, profitable firm. *Risk-takers (Richard and George Cadbury):* 5. They rescued a failing business and built one of Britain’s great firms. *Builders (cocoa makers, engineers, designers):* 4. Pure, consistent products and, from 1905, the hugely popular Dairy Milk bar. *Workers at Bournville:* 5. Among the best conditions of any British factory of the time, though with many rules. *Workers in the supply chain (cocoa farm laborers):* 1. Forced labor on the São Tomé farms, which the firm knew of for years before it stopped buying. *Customers:* 5. Honest, pure products at fair prices. *Community:* 5. Bournville is still a pleasant village more than a century later. Overall, an outstanding business with one serious failure, which shows why the workers who are hardest to see must still be counted.

In business today. Many companies now trace where their raw materials come from and inspect the farms and factories that supply them, partly because of lessons like this one. A wise owner asks not only “Is my own factory fair?” but also “Are the

people who make my supplies treated justly?” The prophet warned against those who use “his neighbour’s service without wages” (Jeremiah 22:13).

PICTURE STUDY



George Cadbury, Unknown photographer, early 1900s · Photograph · Library of Congress, Washington, D.C.

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

George Cadbury (1839–1922) ran the family firm with his brother Richard and, after Richard’s death in 1899, led it for many years. He taught an adult Sunday school class in Birmingham for about fifty years and spent much of his fortune on housing, schools and charities.

Look closely

- Look at his clothes. Do they look rich and showy or plain?
- Look at his face and expression. What kind of person does he seem to be?
- Look for anything in the picture that tells you he was a businessman.

Talk about it

1. Quakers were known for plain living. How might that habit have helped the brothers rescue a failing business?
2. If you could ask George Cadbury one question about the cocoa farms, what would it be?
3. Which of the six stakeholders do you think George Cadbury cared about most? Give evidence from the lesson.

PROJECT

Trace a Supply Chain and Plan a Better Workplace

You will trace the supply chain of one food your family eats as far back as you can, and then design a “factory in a garden” for a small business, with a budget for what you would provide your workers.

You will need

- A food product from your kitchen with a label (chocolate, coffee, bananas, sugar or rice)
- Ledger notebook, colored pencils and calculator
- The company’s website or package information (with a parent)

Steps

1. Choose your product. Read the label and the company’s information. Draw the supply chain as a chain of boxes: farm or mine, processor, factory, shipper, store, your kitchen.
2. For each box, write who works there and what you know (or do not know) about how they are treated. Mark unknowns with a question mark.
3. Look for any label or statement about how the farmers are paid or checked. Write what it says and whether you think it is enough to be sure.
4. **Design a workplace.** Imagine a small bakery with 10 workers that earns \$50,000 profit a year. Choose three things to provide for the workers, as the Cadburys did (for example, a pension contribution, a shared lunch, training classes). Estimate the yearly cost of each.
5. Calculate what percent of profit each choice uses: $\text{cost} \div \$50,000 \times 100$. Make sure the total leaves enough profit to repay the owner and keep the business healthy.
6. Write a stakeholder scorecard for your imaginary bakery, including the farmers who grow its wheat and sugar.
7. Write a paragraph: Why is it hard for a business to know how everyone in its supply chain is treated? What should it do when it learns of a wrong?

Tips

- It is honest to write “I don’t know.” The Cadburys’ story shows how easy it is to assume the best.
- A good benefit plan must be affordable; a business that goes bankrupt helps no one.

Check your work

- ☐ I drew a supply chain with at least five links.
- ☐ I calculated the cost of worker benefits as a percent of profit.
- ☐ I can explain both what the Cadburys did well and where they fell short.

LEDGER NOTEBOOK

1. Draw a map of Bournville as you imagine it: the factory by the stream, cottages with gardens, sports fields and a park.
2. Make a timeline: 1824 John Cadbury’s shop; 1861 Richard and George take over; 1866 Cocoa Essence; 1879 Bournville factory; 1900 Bournville Village Trust; 1905 Dairy Milk; 1906 pension fund; 1909 the firm stops buying São Tomé cocoa.
3. Copy the Cadbury scorecard with seven rows (Bournville workers and supply-chain workers separately) and draw a bar graph.
4. Write a short letter George Cadbury might have written to the Portuguese government in 1907 asking it to end forced labor.

From history. George Cadbury cared so much about decent housing that he built Bournville’s cottages with gardens large enough to grow vegetables and fruit trees, and he set aside about a tenth of the land for parks and open spaces. The Bournville Village Trust still looks after the village today.

COMMON MISTAKES

- Thinking a company is perfect because it treats its own workers well. The workers in its supply chain count too.
- Thinking caring for workers always lowers profits. The Cadburys found that healthy, settled workers were also productive and loyal.
- Thinking the story is all good or all bad. Bournville was a great achievement, and the São Tomé cocoa was a serious failure.

Make it a game • Garden Factory Sketch. Draw a model village on paper with a factory, houses, gardens, a school and a park. Label each feature that the Cadbury brothers gave workers and write one reason a Quaker would do so. Your parent guesses what each feature is for. Finish by tracing a supply chain from cocoa bean to chocolate bar.

Scripture. “Woe unto him that buildeth his house by unrighteousness, and his chambers by wrong; that useth his neighbour's service without wages, and giveth him not for his work;” (Jeremiah 22:13, KJV)

This warning applies all along a supply chain. A business owner who would never cheat his own workers must also refuse to profit from the unpaid labor of people far away.

4.4 TOYOTA'S PRODUCTION SYSTEM: STOP THE LINE, FIX THE PROBLEM

OBJECTIVES

- Tell how Sakichi Toyoda's self-stopping loom led to the Toyota Production System.
- Explain just-in-time, kanban, stopping the line (jidoka) and continuous improvement (kaizen).
- Compare batch production with one-piece flow by measuring time, unfinished work and defects.
- Give Toyota a stakeholder scorecard, including its 1950 crisis and its recalls.

Warm-up. Look in your refrigerator. Is anything going bad because you bought too much? Is anything missing that you need? Write down how your family decides when to buy more milk or bread. How could you have “just enough, just in time”?

WATCH

The Toyota Production System as Taught by Toyota - Episode 01

Toyota Motor Corporation · 1:43

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

WHEN TO WATCH

After the story of the loom, before the big idea.

Note: From Toyota's own short series on its production system.

BACKUP VIDEO

How Toyota Changed The Way We Make Things

Bloomberg Originals · 4:52

<https://www.youtube.com/watch?v=F5vtCRFRAK0>

After the big idea, for a short history of how other companies copied Toyota's methods.

KEY TERMS

jidoka

Toyota's word for "automation with a human touch": machines and workers stop the line as soon as a problem appears, so that defects are fixed at once.

kanban

A card or signal that tells an earlier step to make or send more parts only when a later step has used them.

inventory

Goods and materials a business holds: raw materials, unfinished work and finished goods waiting to be sold.

just-in-time

Making or delivering only what is needed, when it is needed, in the amount needed, so that little is wasted or left waiting.

kaizen

Continuous improvement: making many small changes, often suggested by workers, to make work better every day.

recall

When a company asks customers to return or bring in a product so that a defect can be fixed.

CORE IDEAS

The story. Sakichi Toyoda, born in 1867, was the son of a Japanese carpenter. He watched his mother and neighbors weave cloth by hand and set out to build a better loom. His greatest idea was a power loom that stopped by itself the moment a thread broke, so that one worker could watch many looms and no cloth would be ruined. His Type G automatic loom of 1924 was among the best in the world, and in 1929 he sold the rights to make it to a British company. His son Kiichiro used the family's loom business to start making cars, and in 1937 the Toyota Motor Company was founded. After World War II, Japan was poor and Toyota was small. In 1950 the company nearly went bankrupt. After a long and bitter labor dispute, well over a thousand workers left the company and Kiichiro resigned as president.

How they figured it out. Toyota could not afford the huge stockpiles of parts and the giant, costly machines of American carmakers. A machine-shop manager named Taiichi Ohno set out to make cars with less of everything: less space, less waiting, less **inventory** and fewer defects. He learned from American supermarkets, where shelves are restocked only as customers take goods away. In Toyota's plants, each

step took only the parts it needed from the step before, and a card called a **kanban** told the earlier step to make more. This is **just-in-time**. From Sakichi's loom came **jidoka**: any worker who saw a problem could pull a cord to stop the line, and everyone worked to fix the cause before starting again. Workers were asked for ideas to improve their own jobs, and Toyota received millions of suggestions over the years: **kaizen**. After the 1950 crisis, management and the union agreed that Toyota would work hard to keep its workers employed for the long term.

The big idea. Waste hides in many places: in parts that wait on shelves, in workers who wait for parts, in defects that must be redone, in extra motion and in making more than customers want. Stopping the line seems slow, but it saves time, because a problem fixed at once does not turn into a hundred defective cars. Here is a way to measure it. If a batch of 10 cars is built one step at a time and a mistake at step 1 is found only at the end, all 10 may need rework. In one-piece flow, the mistake is found on the first car, and 9 are saved.

Stakeholder scorecard: Toyota. *Financiers*: 4. Decades of steady profits, after a near-collapse in 1950. *Risk-takers (the Toyoda family)*: 4. They staked the loom fortune on cars and built one of the world's largest automakers. *Builders (engineers and managers)*: 5. The Toyota Production System was copied by factories and hospitals around the world. *Workers*: 4. Long-term employment and a real voice in improving their work, though the pace is demanding. *Customers*: 4. Reliable, affordable cars for decades; but in 2009 and 2010 Toyota recalled millions of cars for problems with accelerator pedals and floor mats, and in 2014 it agreed to pay a U.S. penalty of \$1.2 billion for being slow to report the problems. *Community (suppliers and towns)*: 4. Long relationships with suppliers, though suppliers are pressed hard to cut costs, and when an earthquake and tsunami struck Japan in 2011, the lean supply chain left little in reserve and factories stopped. Overall, a great business that showed even the best must keep telling the truth about its mistakes.

In business today. "Lean" methods based on Toyota's system are used in factories, hospitals, restaurants and offices. A family can use them too: keep a small, steady stock of what you use, notice what is wasted, and fix the cause of a problem instead of working around it. The best part of the system is its honesty: it treats every problem as something to bring into the light and fix.

PICTURE STUDY



Sakichi Toyoda, Unknown photographer, early 20th century · Photograph

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

Sakichi Toyoda (1867–1930) is remembered in Japan as one of its greatest inventors. He held many patents for looms, and his idea that a machine should stop itself when something goes wrong became one of the two pillars of the Toyota Production System.

Look closely

- Look at his formal clothing and medals. What do they suggest about how Japan honored inventors who built new industries?
- Look at his face and expression. What qualities do you think an inventor needs?
- Imagine the loom he invented beside him. What would you want to see it do?

Talk about it

1. Why is a machine that stops itself when a thread breaks more productive than one that keeps going?
2. How did an idea from weaving cloth end up shaping how cars are made?
3. Which stakeholder was Sakichi Toyoda: builder, risk-taker or both?

PROJECT

Batch versus Flow: A Paper-Car Production Line

Your family will build simple paper “cars” two ways: in batches, and in one-piece flow with kanban cards and a stop-the-line rule. You will measure lead time, unfinished work and defects, and then make one kaizen improvement.

You will need

- Paper, scissors, a ruler, glue stick or tape, and markers
- A simple paper-car design: a body (folded rectangle), four wheels (paper circles) and a windshield (a colored square)
- Index cards marked “kanban,” a timer and a ledger page
- Three workers (family members), one for each step: body, wheels, windshield and inspection

Steps

1. Agree on the design and on what makes a car good (four wheels straight, windshield centered).
2. **Batch round.** Step 1 makes all 10 bodies before passing them on; step 2 then attaches all wheels; step 3 adds all windshields and inspects. Start the timer. Record the time when the first car is finished and when the tenth is finished, and count defects.
3. During the batch round, every 2 minutes count how many unfinished pieces are waiting between steps (work in process). Record the counts.
4. **Flow round.** Each step may make one piece only when it receives a kanban card from the next step. Pass cars one at a time. Anyone who sees a defect calls “Stop!”, and everyone helps fix the cause before going on.
5. Record the same measures: time to first car, time to tenth car, work-in-process counts and defects.
6. Make a comparison table. Which round finished the first car sooner? Which had less unfinished work waiting? Which had fewer defects?
7. **Kaizen.** Ask each worker for one improvement. Choose the best, try one more flow round, and record whether it helped.

8. Write a paragraph: Why did stopping the line help, even though it felt slower? What did the workers' suggestions add?

Tips

- The first flow round is often slower in total. Look closely at defects and waiting work, not only speed.
- Thank every worker who calls "Stop!" At Toyota, finding a problem is treated as a help, not a fault.

Check your work

- ☐ I can explain just-in-time, kanban, jidoka and kaizen.
- ☐ I measured and compared batch and flow production.
- ☐ I can give Toyota a stakeholder scorecard that includes its strengths and its recalls.

LEDGER NOTEBOOK

1. Draw a kanban loop: a parts bin at step 1, a card traveling back from step 2, and the bin being refilled. Label each part.
2. Make a table from your project: Round, Time to first car, Time to tenth car, Average work in process, Defects.
3. Make a timeline: 1867 Sakichi born; 1924 Type G loom; 1929 loom rights sold; 1937 Toyota Motor Company; 1950 crisis; 1950s–1970s the production system grows; 2009–2010 recalls; 2011 earthquake.
4. List three kinds of waste you can find in your home or school, and one kaizen idea for each.

From history. In 1984 Toyota and General Motors opened a joint factory in Fremont, California, which had been one of GM's worst plants. Using Toyota's methods, with many of the same workers, it soon became one of the best in America for quality, showing that the system, not only the workers, made the difference.

COMMON MISTAKES

- Thinking just-in-time means having no stock at all. It means having only what is needed, with signals that keep it flowing.
- Thinking stopping the line wastes time. Fixing problems at once prevents many more defects later.

- Thinking a great company never makes mistakes. Toyota's recalls show that even the best must be honest and quick about problems.

Make it a game · Pull the Cord. You and your parent assemble paper cars in a line, one folding and one adding wheels cut from scrap. When either spots a defect, call stop at once and fix it before moving on. After each round, suggest one kaizen improvement. Compare batch versus flow and say what just-in-time and kanban mean.

GREAT BUSINESSES AND THEIR STAKEHOLDERS

A business is great when it creates real value and serves all of its **six stakeholders** over a long time: the **financiers** who lend or invest the money, the **risk-takers** who found and own it, the **builders** who design and make its products, the **workers**, the **customers** and the **community**. A business may be big without being great. In this unit you will weigh four famous businesses with an honest **stakeholder scorecard**: a rating from 1 to 5 and a reason for each of the six.

You will study the Hudson’s Bay Company, chartered in 1670 and for centuries the great fur trader of North America; Matthew Boulton and James Watt, who built and sold the steam engines that powered the factory age; the Cadbury family, Quaker chocolate makers who built a factory in a garden at Bournville; and Toyota, whose production system taught the world to stop the line, fix the problem and waste nothing. Each did great good, and each fell short somewhere. You will finish by writing a stakeholder report on a business of your own choosing.

PREREQUISITES

- Knows the six stakeholders and how to give a scorecard (Grade 5, Unit 4)
- Knows productivity, the factory system and comparative advantage (Unit 1)
- Can find an average and work with percents

MASTERY CHECKLIST

- ☐ I can name the six stakeholders and give a fair 1–5 scorecard with reasons for a business.
- ☐ I can tell the story of the Hudson’s Bay Company and explain the Made Beaver as a unit of account.
- ☐ I can explain how Boulton & Watt sold engines by giving customers part of the savings they made, and how the partnership served and failed its stakeholders.
- ☐ I can tell how the Cadburys built Bournville and weigh both their care for workers and their failure over cocoa grown by forced labor.
- ☐ I can explain just-in-time, kanban and stopping the line in the Toyota Production System.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Soho House (Birmingham Museums)**: Free to read online. The home of Matthew Boulton, where the Lunar Society of inventors and thinkers met. Pictures and history for Lesson 4.2.
- **Bournville Village Trust**: Free. The trust George Cadbury founded in 1900 still manages the village of Bournville. Its website has history and photographs for Lesson 4.3.
- **Toyota Production System (Toyota Motor Corporation)**: Free. Toyota’s own short explanation of just-in-time and jidoka, with diagrams. Read with Lesson 4.4. Ages 11 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

4.1 The Hudson’s Bay Company: Three Centuries of Trade	2 sessions of 50 minutes
4.2 Boulton & Watt: Selling Power	2 sessions of 50 minutes
4.3 Cadbury’s Bournville: A Factory in a Garden	2 sessions of 50 minutes
4.4 Toyota’s Production System: Stop the Line, Fix the Problem	2 sessions of 50 minutes

UNIT 4 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. **8 pts**

Name the six stakeholders of a business and say in a few words what each one puts in.

2. (8 pts)

What was the Hudson's Bay Company's charter of 1670, and why was it a monopoly?

3. (10 pts)

A trapper brings 6 beaver (1 MB each), 2 otter (2 MB each) and 6 martens (3 martens = 1 MB). How many Made Beaver are his furs worth? Can he buy a kettle (6 MB) and a blanket (7 MB)?

4. (8 pts)

Give one way the Hudson's Bay Company served the First Nations trappers and one way it fell short.

5. (8 pts)

What was James Watt's separate condenser, and why did it save fuel?

6. (10 pts)

An old engine burned \$2,400 of coal a year; a Watt engine doing the same work burns \$900. Calculate the saving, the royalty at one-third of the saving, and what the owner keeps.

7. (8 pts)

What did Matthew Boulton bring to the partnership that James Watt lacked?

8. (8 pts)

Name three things the Cadburys provided for workers at Bournville, and explain why they did so.

9. (8 pts)

Why did the jury award Cadbury only one farthing in its 1909 libel case?

10. (8 pts)

Explain kanban and jidoka in the Toyota Production System.

11. (6 pts)

A batch of 20 parts is made before anyone checks them, and a machine setting was wrong from the start. In one-piece flow the mistake would be found on the first part. How many parts are saved from rework? What percent is that?

12. **10 pts**

Short answer: Explain why a business can be big without being great. Use one of the four businesses in this unit as an example.

ANSWER KEY

1. Financiers (money lent or invested); risk-takers (their savings, time and reputation as founders and owners); builders (designs, skill and systems); workers (time, labor and skill); customers (money paid for products); community (roads, services, neighbors and trust).
2. A royal grant from King Charles II creating the company and giving it the sole right to trade in all lands draining into Hudson Bay (Rupert's Land). It was a monopoly because no other English traders were allowed to trade there.
3. Beaver $6 \times 1 = 6$ MB; otter $2 \times 2 = 4$ MB; martens $6 \div 3 = 2$ MB. Total = 12 MB. A kettle and a blanket cost 13 MB, so he is 1 MB short; he could buy the blanket and a knife, or the kettle and other goods.
4. Served: offered useful goods (kettles, blankets, knives) in trade and long, mostly peaceful trading relationships. Fell short (any one): dependence on European goods, diseases, over-trapping, and a charter that gave rule over their lands without asking them.
5. A chamber apart from the cylinder where the steam was cooled, so the cylinder could stay hot. The old engine heated and cooled its cylinder every stroke, wasting coal; Watt's engine did not.
6. Saving = $\$2,400 - \$900 = \$1,500$. Royalty = $\frac{1}{3} \times \$1,500 = \$500$. Owner keeps $\$1,500 - \$500 = \$1,000$ a year.
7. Money and the willingness to borrow and risk it, a large factory (Soho) and skilled workers, business sense and salesmanship.
8. Any three: good houses with gardens, sports fields, parks, a dining hall, classes, doctors and dentists, a pension fund. As Quaker Christians they believed workers were made in God's image and deserved decent lives; healthy, settled workers were also productive.
9. Cadbury won, because it was not a hypocrite in the way the newspaper claimed, but the tiny award showed that many thought the firm had been too slow to stop buying cocoa grown by forced labor on São Tomé.
10. Kanban: a card or signal that tells an earlier step to make or send more parts only when a later step has used them, so nothing is overproduced. Jidoka: stopping the line (by machine or worker) as soon as a problem appears, so the cause is fixed and defects do not multiply.
11. In the batch, all 20 are bad; in flow, only 1 is. 19 parts are saved, which is $19 \div 20 \times 100 = 95\%$.

12. Size measures sales or wealth; greatness means creating real value and serving all six stakeholders over a long time. For example, Cadbury grew large and served its Bournville workers and customers very well, but its supply-chain workers on São Tomé were treated unjustly for years; or the Hudson's Bay Company was huge and lasted centuries, but served the First Nations trappers less well than its shareholders. (Accept any well-supported example.)

PORTFOLIO PIECE: A STAKEHOLDER REPORT ON A BUSINESS OF YOUR CHOICE

Choose a business to study: a family business, a local company you can visit with a parent, or a historical company. Gather facts from an interview (with a parent present), the company's own website, a museum or a library book. Write a two-page report with a short history, a section for each of the six stakeholders (what each puts in, what each gets, and a rating from 1 to 5 with a reason), a bar graph of the six ratings, and a conclusion: Is this business great, good or only big? What one change would make it better for its weakest stakeholder? List your sources at the end.

LOOK FOR	WHAT IT MEANS
Research	Uses at least two reliable sources (one may be an interview) and lists them; facts are accurate.
Fair scorecard	Gives a rating and a specific reason for each of the six stakeholders, including strengths and weaknesses.
Reasoning	The conclusion follows from the evidence and the suggested change is practical.
Presentation	Clear headings, a labeled bar graph, neat work and complete sentences.

UNIT 5

WORKERS, OWNERS AND FAIR RULES

The first factories made goods cheaper for everyone and gave many people steady wages, but they also brought long hours, dangerous machines and children at work. In this unit you will look closely at both sides through the young women who worked in the cotton mills of Lowell, Massachusetts, in the 1830s and 1840s. Then you will study how people worked to set things right, and what it cost: Lord Shaftesbury, an evangelical Christian, and the British Factory Acts; Samuel Gompers and the trade unions that bargained peacefully for better pay and hours; and the Fair Labor Standards Act of 1938, which set the forty-hour week with overtime pay and ended most child labor in American industry.

You will also see a rule that went wrong: the codes of 1933 that fixed prices for whole industries and fined small shopkeepers for charging too little. Throughout, keep in mind the Bible's teaching for both sides: owners must pay fair wages on time and keep their promises (Deuteronomy 24:14-15; James 5:4), and workers must work heartily (Colossians 3:23). Good rules act like a fair referee. They protect honest dealing, safety and children and keep any one side from abusing its power, while leaving people free to work, trade, build and give.

PREREQUISITES

- Knows capital and labor, the Factory Act of 1833 and Lewis Hine simply (Grade 5, Unit 5)
- Knows the factory system and productivity (Unit 1)
- Can multiply hours by wages and calculate a percent

MASTERY CHECKLIST

- ☐ I can describe both the gains and the costs of factory work for the mill girls of Lowell.
- ☐ I can explain what the Factory Acts of 1833 and 1847 required, why Lord Shaftesbury fought for them and what they cost.
- ☐ I can explain collective bargaining and how Samuel Gompers's unions sought better wages and hours by agreement.
- ☐ I can calculate weekly pay with overtime under the Fair Labor Standards Act of 1938.
- ☐ I can tell the difference between a rule that acts as a fair referee and one that backfires, with an example of each.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **A New England Girlhood, by Lucy Larcom (1889)**: Free at Project Gutenberg. Lucy Larcom went to work in a Lowell mill at eleven and later became a teacher and poet. Read her chapters on mill life with Lesson 5.1. Ages 11 and up.
- **Loom and Spindle, by Harriet H. Robinson (1898)**: Free at Project Gutenberg. A former mill girl's memories of Lowell, the boardinghouses and the magazine the workers wrote, *The Lowell Offering*. A parent can choose a chapter to read aloud with Lesson 5.1.
- **Lowell National Historical Park (National Park Service)**: Free. Photographs, maps and short articles about the mills, the canals and the workers. If you live nearby, the park's weave room runs real power looms.

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 The Mill Girls of Lowell: The Gains and Costs of Factory Work

2 sessions of 50 minutes

5.2 The Factory Acts and Lord Shaftesbury

2 sessions of 50 minutes

5.3 Samuel Gompers and the Trade Unions

2 sessions of 50 minutes

5.4 The Fair Labor Standards Act of 1938: The Forty-Hour Week

2 sessions of 50 minutes

UNIT 5 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. **8 pts**

Why did the Lowell mill owners hire young women from New England farms, and what did they do to win their parents' trust?

2. **10 pts**

A mill worker earns \$3.20 a week for 64 hours and pays \$1.40 a week for board. What does she earn per hour? What does she keep each week, and in a 50-week year?

3. **8 pts**

What did the Lowell workers' petition of 1845 ask for, and what did the Massachusetts legislature do?

4. **8 pts**

Name three things the Factory Act of 1833 required. Which part made it work better than earlier laws?

5. (8 pts)

A worker makes 9 items an hour in a 12-hour day. After the Ten Hours Act, rested, she makes 10 items an hour in a 10-hour day. By what percent did hours fall, and by what percent did output fall?

6. (8 pts)

Who was Lord Shaftesbury, and why did he work for factory reform?

7. (8 pts)

What was Samuel Gompers's "pure and simple" unionism?

8. (10 pts)

A worker earns \$24 an hour and makes 12 parts an hour. Find the labor cost per part. If wages rise to \$27 and output rises to 13.5 parts an hour, what is the new labor cost per part?

9. (8 pts)

What happened at Homestead in 1892, and what lesson did it teach?

10. (10 pts)

Under the FLSA, a worker earning \$14 an hour works 47 hours in a week. Calculate her pay.

11. (6 pts)

Name the three main things the Fair Labor Standards Act of 1938 required.

12. (8 pts)

Short answer: Compare the 1933 industry codes with the 1938 FLSA. Which acted more like a fair referee, and why?

ANSWER KEY

1. New England had few landless workers, and young farm women were available and capable. The owners built boardinghouses run by respectable keepers, with curfews and an expectation of church attendance, and paid wages in cash that were higher than other jobs open to women.
2. Per hour: $\$3.20 \div 64 = \$0.05$ (5¢). She keeps $\$3.20 - \$1.40 = \$1.80$ a week; $\$1.80 \times 50 = \$90.00$ a year.
3. It asked for a ten-hour working day. The legislature held hearings, the first government inquiry into working conditions in America, but did not pass a law.
4. Any three: no children under nine in most textile mills; children 9–13 limited to 9 hours a day and 48 a week; young people 13–18 limited to 12 hours a day and 69 a week; two hours of school a day for the younger children; four factory inspectors. The inspectors made it work, because they could enter mills and bring cases.
5. Hours: $(12 - 10) \div 12 \times 100 \approx 16.7\%$. Output before $9 \times 12 = 108$; after $10 \times 10 = 100$; fall $(108 - 100) \div 108 \times 100 \approx 7.4\%$.
6. Anthony Ashley-Cooper, Lord Ashley and later the 7th Earl of Shaftesbury, a member of Parliament and evangelical Christian who led the campaigns for the Factory Acts, the Mines Act and other reforms. He believed his faith required him to defend the weak and the poor.
7. A practical approach that focused on wages, hours and working conditions, won through collective bargaining and written contracts with employers, rather than through grand schemes to remake society or violence.
8. Before: $\$24 \div 12 = \$2.00$ per part. After: $\$27 \div 13.5 = \$2.00$ per part. Wages rose 12.5%, but because productivity rose 12.5% too, the cost per part did not change.
9. Carnegie Steel and the steelworkers' union could not agree on a contract; the manager locked out the union workers and brought in hired guards, a violent clash followed, the militia was sent, and the union was broken. It taught that when both sides refuse to bargain fairly, everyone suffers great harm.
10. Regular: $40 \times \$14 = \$560$. Overtime: $7 \times \$14 \times 1.5 = \$147$. Total: $\$707$.
11. A national wage floor (25¢ an hour at first, rising over time); a standard work week (falling to 40 hours by 1940) with overtime at time and a half; and limits on child labor (no most factory and mine work under 16, no hazardous work under 18).

12. The 1933 codes tried to fix prices, wages and output for whole industries, protected large firms and punished small shopkeepers like the tailor Jacob Maged for charging less; they were struck down in 1935. The FLSA set a few clear limits on hours, pay and child labor and left businesses free to make, price and sell. The FLSA acted more like a fair referee. (Accept any well-reasoned answer.)

PORTFOLIO PIECE: A FAIR-RULES CASE FILE

Choose one rule or agreement from this unit: the Factory Act of 1833, the Ten Hours Act of 1847, a union contract, the Fair Labor Standards Act of 1938 or the industry codes of 1933. Build a case file of one to two pages with five headings: The problem (who was harmed and how, with at least one number), The people (who argued for it and who against, and their reasons), The rule (what it required and how it was enforced), The results (what changed, with at least one number or date) and The cost (who paid, and how). End with your judgment: did this rule act like a fair referee, too few rules or too many? Add a timeline and one captioned picture or drawing.

LOOK FOR	WHAT IT MEANS
Accuracy	Names, dates, numbers and requirements are correct and come from the lessons or reliable sources.
Fairness	Presents the arguments of both supporters and opponents honestly, and counts both the benefits and the costs.
Reasoning	The final judgment is clearly explained using the idea of a fair referee.
Presentation	Five clear headings, a timeline, a captioned picture and neat, complete sentences.

5.1 THE MILL GIRLS OF LOWELL: THE GAINS AND COSTS OF FACTORY WORK

OBJECTIVES

- Tell how Francis Cabot Lowell and his partners built the Lowell mills and hired young women from New England farms.
- Describe the work, pay, boardinghouses and hours of the mill girls.
- Weigh the gains and costs of mill work from the workers' point of view, with numbers.
- Explain how the mill girls used peaceful petitions to ask for a shorter day.

Warm-up. Imagine you are fifteen and live on a farm in New Hampshire in 1835. A mill in Lowell offers you a job. List three reasons you might go and three reasons you might remain on the farm.

WATCH

The Massachusetts Mill Workers, Lowell National Historical Park

Prairie Public · 6:31

<https://www.youtube.com/watch?v=zSVk6axNHkQ>

WHEN TO WATCH

After the story, before “Who gained?”

Note: From Prairie Public, a public television station, filmed at Lowell National Historical Park.

KEY TERMS

integrated mill

A factory that does every step under one roof, from raw cotton to finished cloth, as the Boston Manufacturing Company first did in America in 1814.

boardinghouse

A house where workers rented a bed and ate their meals, run by a keeper who also enforced rules.

petition

A written request, signed by many people, asking a government or an employer to make a change.

real wage

What a wage can actually buy, after counting what the worker must pay for things like food and housing.

turnout

The old word for a group of workers walking off the job together to object to a change, as some Lowell workers did in 1834 and 1836.

CORE IDEAS

The story. In 1810 a Boston merchant named Francis Cabot Lowell traveled to Britain and toured its cotton mills, carefully memorizing how the power looms worked, since Britain did not allow the plans to leave the country. Back home, with the mechanic Paul Moody, he built an American power loom, and in 1814 his Boston Manufacturing Company in Waltham, Massachusetts, became the first **integrated mill** in America, turning raw cotton into finished cloth under one roof. Lowell died in 1817, but his partners built a whole new mill town on the falls of the Merrimack River and named it after him. By the 1840s, Lowell had many mills, canals to carry water to their wheels, and thousands of workers.

How they figured it out. The owners needed many workers, and New England had few landless poor. So they hired young unmarried women, mostly fifteen to thirty years old, from farm families across New England. To persuade careful parents, they built **boardinghouses** run by respectable keepers, with a 10 p.m. curfew and an expectation of church attendance. The pay was more than a young woman could earn as a teacher or a household servant, and it was paid in cash. Many mill girls saved money, sent it home, paid for a brother's schooling or saved for marriage. They formed reading circles, attended lectures, and wrote and published their own magazine, *The Lowell Offering*, from 1840. But the work was hard: a bell rang them out of bed before dawn, the day often ran thirteen hours or more in summer, the work week often passed seventy hours, and the weaving rooms were hot, loud and full of cotton dust.

Who gained? Over time, competition and falling cloth prices led the owners to cut piece rates and make each worker tend more looms at a faster pace. In 1834, after a

wage cut, and in 1836, after a rise in boardinghouse charges, groups of workers walked out in **turnouts**. These were small and soon ended. In 1845 a mill worker named Sarah Bagley helped found the Lowell Female Labor Reform Association, and the workers sent the Massachusetts legislature a **petition** with many signatures asking for a ten-hour day. The legislature held hearings, the first government inquiry into working conditions in America, but it decided not to pass a law. By the 1850s many of the farm women had left, and their places were taken by poorer families newly arrived from Ireland, who had fewer choices.

The big idea. To judge whether a job is good, look at the **real wage**: what the pay can actually buy after necessary costs, and at the hours and conditions too. Here is a practice example (round numbers, not actual Lowell wages). A worker earns \$3.00 a week and pays \$1.25 for board. She keeps $\$3.00 - \$1.25 = \$1.75$ a week, or $\$1.75 \times 50 = \$87.50$ in a working year of 50 weeks. If she works 70 hours a week, she earns $\$3.00 \div 70 \approx 4.3\text{¢}$ an hour. If her pay is cut 10% and her board stays the same, she keeps $\$2.70 - \$1.25 = \$1.45$, a cut of $(1.75 - 1.45) \div 1.75 \approx 17\%$ in what she can save. Small changes in pay or costs make large changes in what a worker can keep.

In business today. Many people around the world still move from farms to factories, as the Lowell women did, because factory work pays more than the choices they had. The same questions still matter: Is the pay fair and honest? Are the hours and conditions safe? Can workers speak up peacefully? Good employers answer those questions before workers have to ask.

PICTURE STUDY



New England Factory Life: "Bell-Time", Winslow Homer, engraved for Harper's Weekly, 1868 · Wood engraving · Cleveland Museum of Art (this print)

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

Winslow Homer drew this scene of workers leaving the mills at Lawrence, Massachusetts, a mill town near Lowell, for the magazine *Harper's Weekly* in 1868. "Bell-time" was the moment the mill bell rang to end the working day.

Look closely

- Count the women, the men and the children. Who makes up most of this workforce?
- Look at the workers' faces and the way they walk. Do they look tired, cheerful or both?
- Find the mill building and the canal. Why were the mills built beside water?
- Find what the workers are carrying.

Talk about it

1. What does this picture tell you about the hours these workers kept?
2. If one of these young women wrote a letter home tonight, what might she say about her week?
3. What might the mill owner want this picture to show? What might a reformer want it to show?

PROJECT

A Mill Girl's Ledger

You will keep a mill girl's ledger for one imaginary year, using practice wages and costs, to see what she could save, what a pay cut would do, and what a shorter day would mean. Then you will write a petition as the workers did.

You will need

- Ledger notebook, ruler and calculator
- Optional: a chapter of Lucy Larcom's *A New England Girlhood*

Steps

1. Set up a ledger: Week, Hours worked, Pay, Board, Other costs, Saved, Running total.
2. Use these practice numbers: pay \$3.00 a week for 70 hours; board \$1.25 a week; other costs (clothes, church offering, books) 25¢ a week.
3. Fill in the first four weeks. Then calculate what she would save in a 50-week year.
4. Calculate her pay per hour ($\text{pay} \div \text{hours}$) and the share of her pay that goes to board ($\text{board} \div \text{pay} \times 100$).
5. **The wage cut.** In week 5 her pay is cut 15%. Calculate the new pay and her new yearly savings. By what percent did her savings fall?
6. **The ten-hour day.** Suppose a law cut her week from 70 to 60 hours at the same weekly pay. Calculate her new pay per hour. Then suppose instead that pay was cut in proportion to hours. What would her weekly pay be?
7. Write a short, respectful petition to the mill owners or the legislature, as the 1845 workers did. State the problem with numbers, ask for one specific change and give one reason it would also help the mill.
8. Write a paragraph: Was mill work a good choice for a young woman in 1840? Give the gains and the costs.

Tips

- Keep the units straight: dollars per week, hours per week, cents per hour.

- A good petition is honest and polite and shows that the writers want the business to succeed too.

Check your work

- ☐ I kept a weekly ledger and calculated yearly savings.
- ☐ I calculated pay per hour and the effect of a pay cut.
- ☐ I wrote a respectful petition with numbers and a clear request.

LEDGER NOTEBOOK

1. Draw a mill girl's day as a clock face or timeline, from the morning bell to curfew, with work, meals and free time marked.
2. Make a two-column chart: Gains of mill work, Costs of mill work, with at least four items in each.
3. Make a timeline: 1810–1812 Lowell tours British mills; 1814 Waltham mill; 1817 Lowell dies; 1820s the town of Lowell is built; 1834 and 1836 turnouts; 1840 *The Lowell Offering*; 1845 ten-hour petition and hearings.
4. Copy one sentence from Lucy Larcom or Harriet Robinson (if you read them) that shows how a mill girl felt about her work.

From history. Lucy Larcom went to work in a Lowell mill in 1835, when she was only eleven, to help her widowed mother. She worked for about ten years, read and wrote poems in her spare time, and later became a teacher and a well-known poet. Her book about her childhood, *A New England Girlhood*, is one of the best accounts of life in the mills.

COMMON MISTAKES

- Thinking the mill girls were forced to work. They chose the mills because the pay was better than their other choices, even though the work was hard.
- Looking only at pay. Hours, costs, safety and freedom matter too; that is why the real wage and conditions must be counted.
- Thinking the petition failed completely. It did not win a law in 1845, but it began a long effort that later won shorter hours.

Make it a game • Lowell Pay Packet. Give yourself a pay envelope of pretend money for four weeks of mill work. From each week subtract boardinghouse cost and one purchase. First guess the savings left, then count them. Beat your own guess next time. Tell the story of the Lowell mills, the hours, and why real wage matters more than the number.

Scripture. “Give her of the fruit of her hands; and let her own works praise her in the gates.” (Proverbs 31:31, KJV)

The virtuous woman of Proverbs 31 is praised for her work and is rightly given its fruit. Many Lowell women worked hard to help their families, and they deserved fair pay for what their hands produced.

5.2 THE FACTORY ACTS AND LORD SHAFTESBURY

OBJECTIVES

- Tell how the Sadler Committee, Lord Ashley (later Lord Shaftesbury) and others won the Factory Act of 1833, the Mines Act of 1842 and the Ten Hours Act of 1847.
- State what the Factory Acts required and how inspectors enforced them.
- Weigh the mill owners' argument that shorter hours would destroy profits against what actually happened.
- Calculate weekly hours under each act and the effect of shorter hours on output.

Warm-up. How many hours a week do you spend on school, chores and sleep? Add them up. Now imagine working 12 hours a day, 6 days a week, at a machine. How many hours is that? What would be left for school, rest and church?

WATCH

Lord Shaftesbury - Everyone A Child Should Know

10ofthose · 2:38

<https://www.youtube.com/watch?v=BOdceccw8ls>

WHEN TO WATCH

After the story of Lord Ashley, before “How they figured it out.”

Note: From a Christian publisher's series of short biographies for children, simpler than this lesson.

BACKUP VIDEO

Victorian child labour: all work and no play

Inspire Education · 3:11

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

Before the story, to see what factory work was like for children.

KEY TERMS

Factory Act

Any of a series of British laws, beginning in earnest in 1833, that limited working hours for children, young people and later women in factories, and required inspection and safety.

Royal Commission

A group appointed by the British government to investigate a problem and report what it found, often with evidence from witnesses.

evangelical

A Bible-believing Christian of the Reformation churches who emphasizes the Bible, personal faith in Christ and spreading the gospel; many led reform movements in the 1800s.

factory inspector

An official appointed to visit factories, check that the law was obeyed and bring cases against owners who broke it.

relay system

A trick some mill owners used to get around the law by sending workers in and out at different times, which made hours hard to check.

CORE IDEAS

The story. In 1832 a committee of the British Parliament, led by Michael Sadler, heard witness after witness describe children in textile mills working twelve to sixteen hours a day, beaten to keep them awake, and injured by machines. When Sadler lost his seat in Parliament, a young nobleman, Lord Ashley, took up the cause. Ashley, who became the 7th Earl of Shaftesbury in 1851, was an **evangelical** Christian who believed his faith required him to defend the weak. He would spend more than fifty years on reform: factory hours, children in coal mines, chimney sweeps, schools for the poorest children and care for the mentally ill. He often turned down high office so that he could keep working on these causes.

How they figured it out. The Factory Act of 1833 banned children under nine from most textile mills, limited children aged nine to thirteen to nine hours a day and 48 a week, limited young people aged thirteen to eighteen to twelve hours a day and 69 a week, required two hours of school a day for the younger children, and, most

important, appointed four **factory inspectors** with power to enter mills and bring cases to court. Earlier laws had failed because no one checked. In 1842, after a **Royal Commission** published drawings and testimony from the coal mines, the Mines Act banned women and girls, and boys under ten, from working underground. In 1847, after years of campaigning by Shaftesbury and others, the Ten Hours Act limited women and young people in textile mills to ten hours a day and 58 a week. Some owners got around it with the **relay system**, until new acts in 1850 and 1853 set fixed hours for the whole mill.

The big idea. Many mill owners warned that the laws would ruin them. In 1837 the economist Nassau Senior argued that a mill's whole profit was made in the last hour of the day, so cutting an hour would wipe it out. He was wrong, because he assumed workers would produce the same amount in every hour no matter how tired they were. Here is a practice example. A worker makes 10 yards of cloth an hour in a 12-hour day: 120 yards. Rested and working 10 hours, she makes 11 yards an hour: 110 yards. Hours fell $(12 - 10) \div 12 \approx 17\%$, but output fell only $(120 - 110) \div 120 \approx 8\%$. Mill owners also found ways to run machines faster and better. British textile output kept growing after the Ten Hours Act. The laws did have costs: some owners spent more on wages and inspections, and families lost children's earnings, which was hard for the poorest. But the gain, children in school and workers with time to rest, worship and live, was far greater.

Think it through. The Factory Acts are an example of a rule that works like a fair referee. They did not tell owners what to make, what to charge or whom to hire. They set clear limits on hours for those least able to protect themselves, they were enforced by inspectors, and they were changed when owners found loopholes. A rule that cannot be checked does little good; a rule that tries to control everything does harm.

In business today. Laws on working hours, children's work and factory inspection are now common in most countries, and they grew from these British acts. Good business owners keep the law willingly, because they understand why it exists. Shaftesbury's example also shows that one faithful person, working patiently for many years, can "plead the cause of the poor and needy" (Proverbs 31:9) and change a nation.

PICTURE STUDY



Anthony Ashley-Cooper, 7th Earl of Shaftesbury, George Frederic Watts, about 1862 · Oil on canvas ·
National Portrait Gallery, London
Image: [Wikimedia Commons](#), public domain

George Frederic Watts painted a series of portraits of the great people of Victorian Britain, which he gave to the nation. He painted Lord Shaftesbury when the reformer was about sixty, after thirty years of work for factory children.

Look closely

- Look at his face. Does he look proud, tired, determined or kind?
- Look at his clothes. Do they look grand, like a nobleman's, or plain?
- Notice how dark the background is. Why might the painter focus all the light on his face?

Talk about it

1. Shaftesbury was a rich nobleman who did not need to work in factories. Why would he spend his life on the cause of factory children?
2. What would you want to ask him about the mill owners who opposed him?
3. How is this portrait different from the portraits of businessmen you have studied this year?

PROJECT

The Inspector's Report

You will act as one of the first factory inspectors of 1833. You will check a mill's time book against the law, calculate weekly hours and fines, and then test Nassau Senior's "last hour" argument with a productivity experiment of your own.

You will need

- A "mill time book" you make from the list in step 1
- Ledger notebook, calculator and a timer
- A simple repetitive task, such as sorting 200 mixed beans or coins by type

Steps

1. Copy this mill time book: Mary, age 8, 10 hours a day; John, age 11, 10 hours a day; Ann, age 12, 9 hours a day; Thomas, age 15, 12 hours a day; Sarah, age 16, 13 hours a day. All work 6 days a week.
2. For each worker, calculate weekly hours. Check each against the 1833 Act: under 9 not allowed; 9–13 no more than 9 hours a day and 48 a week; 13–18 no more than 12 hours a day and 69 a week.
3. Write a short inspector's report listing each violation and what the owner must change.
4. Recalculate Thomas's and Sarah's weekly hours under the 1847 Ten Hours Act (10 hours a day and 58 a week at most). How many hours a week does each gain?
5. **The "last hour" test.** Do your sorting task in 5-minute rounds with no break for 30 minutes, counting how many you sort in each round. Record the counts.
6. Another day, do six 5-minute rounds with a 2-minute rest after every two rounds. Record the counts.
7. Graph both sets of results. Did your speed fall as you tired? Did rest change your total?

8. Write a paragraph: Was Nassau Senior right that the last hour makes all the profit? Use your numbers and the lesson.

Tips

- Count honestly. Rushing and making mistakes lowers real output.
- Remember that factory children worked twelve hours, not thirty minutes. Your experiment shows only the beginning of tiredness.

Check your work

- ☐ I can state what the Factory Act of 1833 and the Ten Hours Act of 1847 required.
- ☐ I checked a time book against the law and wrote an inspector's report.
- ☐ I can explain why shorter hours did not destroy the mills' profits.

LEDGER NOTEBOOK

1. Make a table of the laws: 1833 Factory Act, 1842 Mines Act, 1844 Factory Act (guards on machinery), 1847 Ten Hours Act, 1850 and 1853 acts (fixed hours). For each, write who it protected and what it required.
2. Draw a bar graph comparing weekly hours for a child of twelve before 1833 (72 hours), under the 1833 Act (48 hours), and your own weekly school hours.
3. Copy your "last hour" results as a line graph with two lines, "no rest" and "with rest."
4. Write three of the causes Lord Shaftesbury worked for and one sentence on why each mattered.

From history. When Lord Shaftesbury died in 1885, thousands of poor people lined the streets of London for his funeral, many of them from the ragged schools and charities he had served. Shaftesbury Avenue, one of the main streets of London's West End, was named in his honor in 1886.

COMMON MISTAKES

- Thinking one law fixed everything. Reform came through many acts over decades, each fixing loopholes in the last.
- Thinking the laws were all cost and no gain for owners. Rested workers were often more productive per hour, and output kept growing.
- Forgetting enforcement. The 1833 Act worked better than earlier laws mainly because it created inspectors.

Make it a game • Three Acts in Order. Write three cards: the Factory Act of 1833, the Mines Act of 1842 and the Ten Hours Act of 1847. Shuffle them and put them in order from memory. Then tell what each required and how inspectors enforced it. Your parent slips in one false fact. Catch it to win. Name Lord Ashley.

Scripture. “Open thy mouth, judge righteously, and plead the cause of the poor and needy.” (Proverbs 31:9, KJV)

Factory children could not speak in Parliament for themselves. Lord Shaftesbury opened his mouth for them for fifty years. Christians are called to speak up, honestly and patiently, for those who cannot.

5.3 SAMUEL GOMPERS AND THE TRADE UNIONS

OBJECTIVES

- Tell how Samuel Gompers built the American Federation of Labor and what he meant by “pure and simple” unionism.
- Explain collective bargaining and what goes into a union contract.
- Tell plainly what happened at Homestead in 1892 and what it teaches about failed bargaining.
- Calculate labor cost per unit and explain why wages can rise without hurting a business when productivity rises too.

Warm-up. Imagine you and four friends are hired to rake leaves for a neighbor. If each of you asks for a raise alone, what might the neighbor say? What if all five of you ask together, politely, after doing excellent work? Write which way you think would work better, and why.

WATCH

American Federation of Labor (American Labor Movement)

Tom Richey • 5:32

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

WHEN TO WATCH

After the story of Gompers, before the big idea.

Note: A history teacher’s explanation, made for high-school students. Watch with a parent.

BACKUP VIDEO

The Rise of Labor Unions

NBC News Learn • 2:48

https://www.youtube.com/watch?v=2xrnu_7dRrY

Before the lesson, for a short overview of why workers formed unions in the late 1800s.

KEY TERMS

trade union

An organization of workers in a trade or industry who join together to bargain with employers over wages, hours and working conditions.

contract

A written agreement, here between an employer and a union, setting wages, hours, rules and how disputes will be settled, for a set period.

labor cost per unit

How much the employer pays in wages for each item made: $\text{wage per hour} \div \text{items made per hour}$.

collective bargaining

Negotiation between an employer and a union representing many workers, aimed at a written agreement both sides will keep.

federation

A union of separate organizations that keep their own leaders but work together, like the American Federation of Labor.

CORE IDEAS

The story. Samuel Gompers was born in London in 1850 to a poor Jewish family. He left school at ten to learn a skilled hand trade, and in 1863 his family moved to New York, where he worked in crowded workshops and joined his trade's union as a teenager. He saw unions fail again and again: some collapsed when times were bad, and others spent their energy on grand schemes to remake society and on violent talk. Gompers decided that unions should be practical. In December 1886, at Columbus, Ohio, he helped found the American **Federation** of Labor (AFL), a federation of separate unions of skilled trades, such as carpenters, printers and machinists. He served as its president, with a single one-year break, until his death in 1924. By 1920 the AFL had about four million members.

How they figured it out. Gompers called his approach “pure and simple” unionism: focus on wages, hours and working conditions, and win them through **collective bargaining** and written **contracts**, not upheaval. Unions collected small dues so they could support members in hard times, and they built up skill and reputation so employers would want to deal with them. Asked what labor wanted, Gompers once answered with a list that began “more schoolhouses and less jails.” He supported the

eight-hour day and laws against child labor, but he believed most gains should come by agreement between employers and workers. In 1894 Congress made Labor Day a national holiday, and in 1935 a federal law protected workers' right to form unions and required employers to bargain with them.

Think it through. Bargaining can fail, and when it does, everyone loses. In 1892, at Carnegie Steel's great works at Homestead, Pennsylvania, the company and the steelworkers' union could not agree on a new contract. The manager, Henry Clay Frick, locked the union workers out and brought in hired guards. A violent clash followed, the state militia was sent, the company reopened with non-union workers, and the union was broken. For decades the big steel mills had no union at all. The lesson that both owners and workers drew was that sides that refuse to deal fairly with each other can do terrible damage.

The big idea. A single worker has little bargaining power with a large employer; workers bargaining together have more. But a union cannot raise wages forever without regard to the business, because the employer must sell its goods at prices customers will pay. The key is **labor cost per unit**: $\text{wage per hour} \div \text{items per hour}$. If a worker earns \$20 an hour and makes 10 parts an hour, labor cost is \$2.00 a part. If wages rise 10% to \$22 and productivity rises 10% to 11 parts, labor cost is still $\$22 \div 11 = \$2.00$ a part. When wages rise with productivity, both sides gain. When wages rise much faster than productivity, prices must rise or the business shrinks, and jobs can be lost. Honest bargaining looks at these numbers together.

In business today. Many workers today belong to unions and many do not; both owners and workers do best when they keep their agreements and deal honestly. Scripture asks both sides to keep their word: "Can two walk together, except they be agreed?" (Amos 3:3). A fair contract, honestly kept, is a kind of peace treaty between people who need each other.

PICTURE STUDY



Samuel Gompers at His Desk, Harris & Ewing (photographers), about 1915–1920 · Photograph · Library of Congress, Washington, D.C.

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

Harris & Ewing was a famous photography studio in Washington, D.C., whose thousands of glass negatives are now kept by the Library of Congress. This photograph shows Samuel Gompers at work as president of the American Federation of Labor, in its Washington offices.

Look closely

- Look at the desk. What does all the paper tell you about Gompers's work?
- Look at his clothes and his office. Does he look like a factory worker, a businessman or something in between?
- Find the flowers. There are a great many of them. Why might people have sent them to him?

Talk about it

1. Gompers began as a skilled craftsman at a workbench. How had his work changed by the time of this photograph?
2. What would a union leader need to be good at: speaking, writing, arithmetic, patience? Which do you think matters most?
3. Which of the six stakeholders did Gompers speak for, and how did his work affect the others?

PROJECT

A Bargaining Table

You and a parent will hold a real bargaining session over a household job. You will gather numbers first, bargain respectfully, write a short contract and keep it. Then you will calculate labor cost per unit and see how productivity changes the bargain.

You will need

- A real household job that is done often (folding laundry, weeding, washing dishes)
- A timer, ledger notebook and calculator
- A parent as the “employer” and, if possible, a sibling as a fellow “union member”

Steps

1. Choose the job and agree on what counts as one unit (one load of laundry folded, one row weeded).
2. Time yourself doing three units. Find your average time per unit and units per hour.
3. Prepare your case: what you propose to be paid per hour (or in extra free time), why it is fair, and what quality you promise.
4. The “employer” prepares too: what the job is worth to the family and what it can afford.
5. **Bargain.** Sit at a table. Each side states its proposal and reasons. Listen, ask questions and look for an agreement both can accept. No shouting or walking out.
6. Write a one-page contract: the job, the quality standard, the pay, when it will be paid, how long the contract lasts and how a disagreement will be settled. Both sides sign.
7. Calculate labor cost per unit: $\text{pay per hour} \div \text{units per hour}$. Then find a better method or tool, time yourself again, and recalculate. Could you now be paid more per hour without the cost per unit rising?

8. Keep the contract for two weeks and record each job done and each payment in your ledger. Write a paragraph about whether both sides kept their word.

Tips

- Bring numbers to the table. Both sides bargain better with facts than with feelings.
- A good contract is specific: “fold and put away two loads by Saturday noon” is better than “help with laundry.”

Check your work

- ☐ I can explain collective bargaining and what goes into a contract.
- ☐ I calculated labor cost per unit before and after improving my method.
- ☐ I wrote, signed and kept a fair contract.

LEDGER NOTEBOOK

1. Make a timeline: 1850 Gompers born; 1863 to New York; 1886 AFL founded; 1892 Homestead; 1894 Labor Day; 1924 Gompers dies; 1935 law protecting the right to organize.
2. Copy the labor-cost example ($\$20 \div 10 = \$2.00$; $\$22 \div 11 = \$2.00$) and make one of your own.
3. Draw two people at a bargaining table and write in speech bubbles one fair request from the worker and one fair concern from the employer.
4. What I would change: one sentence about how you would bargain differently next time.

From history. Gompers worked closely with government during World War I to keep factories running, and in 1919 he helped write the part of the peace treaty that set up the International Labour Organization, which still works with governments, employers and workers on fair labor standards around the world.

COMMON MISTAKES

- Thinking unions and employers must be enemies. Gompers’s approach aimed at written agreements both sides would keep.
- Thinking wages can rise without limit. Wages that rise much faster than productivity raise costs, which can cost jobs.
- Forgetting that a contract binds both sides. Workers promise good work, and employers promise fair pay and conditions.

Make it a game • Chore Contract Table. Your parent is the employer with a list of chores and a pile of pretend coins. You represent the workers, deciding together on wages and hours. Bargain until you can write a three-term contract that both of you sign. Then switch sides. Explain how Samuel Gompers' pure and simple unionism differed.

Scripture. “Can two walk together, except they be agreed?” (Amos 3:3, KJV)

Owners and workers must walk together if a business is to succeed. An honest agreement, fairly bargained and faithfully kept, lets them do it.

5.4 THE FAIR LABOR STANDARDS ACT OF 1938: THE FORTY-HOUR WEEK

OBJECTIVES

- Tell how Henry Ford’s five-day week, Frances Perkins and the Fair Labor Standards Act of 1938 led to the forty-hour week.
- State what the FLSA required: a wage floor, overtime pay and limits on child labor.
- Calculate weekly pay with overtime at time and a half.
- Contrast the FLSA with the industry codes of 1933, which fixed prices and were struck down in 1935.

Warm-up. Ask a parent how many hours a week he or she works, and whether any of those hours are paid at a higher “overtime” rate. If a worker earns \$10 an hour and works 45 hours, how much should he be paid if every hour is paid the same? Write your answer; you will check it later in the lesson.

WATCH

40-Hour Work Week - Decades TV Network

Decades TV Network • 2:05

<https://www.youtube.com/watch?v=61lfZGReQHU>

WHEN TO WATCH

After the story, before the big idea.

Note: A short history clip from a classic-television network.

KEY TERMS

Fair Labor Standards Act (FLSA)

The U.S. law of 1938 that set a national lowest legal hourly wage, required overtime pay for long weeks and limited child labor, for workers in businesses that traded across state lines.

overtime

Hours worked beyond the standard week (40 hours under the FLSA), paid at one and a half times the regular rate.

time and a half

Pay of 1.5 times the regular hourly wage.

wage floor

A legal lowest wage per hour that an employer may pay; a kind of price floor for labor.

industry code

A set of rules for a whole industry; in 1933 these codes fixed prices, wages and output and were struck down by the Supreme Court in 1935.

CORE IDEAS

The story. In 1926 Henry Ford announced that his factories would move to a five-day, forty-hour week, while keeping pay the same. He argued that workers with free time would also be customers who would buy cars and travel. Other employers followed, though many workers still worked much longer weeks. In the Great Depression of the 1930s, when jobs were scarce, some employers paid very low wages for very long hours, and children were still at work in some industries. Frances Perkins, who had seen the terrible Triangle factory fire in New York in 1911 and spent her life working for safer workplaces, became Secretary of Labor in 1933, the first woman ever to serve in a President's cabinet. She worked for years for a national law on hours and wages.

How they figured it out. The first attempt went badly. In 1933 Congress created **industry codes** that let each industry set its own prices, wages and output under government approval. The codes were complicated and often protected large firms at the expense of small ones. In 1934 a tailor in Jersey City, New Jersey, named Jacob Maged was fined and jailed for pressing a suit for 35¢ when the code price was 40¢. In 1935 the Supreme Court struck the whole system down. Congress tried again with a simpler, narrower law. The **Fair Labor Standards Act**, signed on June 25, 1938, set a **wage floor** of 25¢ an hour, rising over several years; a standard work week of 44 hours, falling to 40 hours by 1940, with **overtime** paid at **time and a half** for longer weeks; and a ban on most factory and mine work for children under sixteen, and hazardous work under eighteen. At first it covered only about one worker in five, mainly in factories, mines and businesses that traded across state lines.

The big idea. Overtime pay works like this: *weekly pay* = (*regular hours* × *wage*) + (*overtime hours* × *wage* × 1.5). A worker earning \$10 an hour who works 45 hours earns $40 \times \$10 = \$400$ plus $5 \times \$10 \times 1.5 = \$75$, for a total of \$475, not \$450. Overtime makes very long weeks more costly, which encourages employers to hire more workers or to schedule better. A wage floor is a kind of **price floor** (Lesson 3.3): it protects workers from very low pay, and if it is set much higher than what some workers' labor can earn for a business, those jobs may not be offered. Lawmakers have to weigh both effects. The 1938 law was narrow, simple and clear, and it has lasted, with changes, ever since.

Think it through. Compare the two rules. The 1933 codes tried to control prices, output and wages for whole industries, punished small shopkeepers for charging less, and backfired. The FLSA set a few clear limits on hours, pay and children's work and left businesses free to make, price and sell as they chose. One acted like a fair referee; the other tried to play the game for everyone. The Bible gives a pattern of limits on work too: "Six days shalt thou labour, and do all thy work" (Exodus 20:9), followed by a day of rest.

In business today. Most American workers who are paid by the hour still earn overtime after 40 hours, and children under sixteen may work only limited hours in certain jobs, usually outside school hours. Many teenagers have their first job under these rules. An honest employer pays every hour owed, and an honest worker records his hours truthfully.

PICTURE STUDY



Frances Perkins, Secretary of Labor, Harris & Ewing (photographers), 1930s · Photograph · Library of Congress, Washington, D.C.

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

Frances Perkins served as Secretary of Labor from 1933 to 1945, longer than anyone else has held the job. She was a devout Christian who regularly went on quiet retreats at an Episcopal convent to pray. She dressed plainly and was known for her patience in working out laws with people who disagreed with her.

Look closely

- Look at her plain dark clothes and hat. What impression do you think she wanted to give to the men she worked with in government?
- Look at her face. Does she look stern, kind, determined or tired?
- Notice that the photograph is a plain studio portrait. What does that tell you about how she was seen?

Talk about it

1. Perkins saw the Triangle fire in 1911 and spent the rest of her career on workplace safety and fair hours. How can one terrible event shape a person's calling?
2. Why might a narrow, simple law like the FLSA last longer than a complicated one like the 1933 codes?

3. If you could ask her one question about the 1938 law, what would it be?

PROJECT

Payroll Clerk for a Week

You will be the payroll clerk for a small bakery for one week, calculating each worker's pay with overtime under FLSA rules, checking a teenager's schedule against child-labor rules, and comparing the cost of overtime with the cost of hiring another worker.

You will need

- Ledger notebook or a free spreadsheet
- A calculator

Steps

1. Copy this time sheet (practice numbers). Ana: \$16 an hour, 38 hours. Ben: \$18 an hour, 46 hours. Carla: \$15 an hour, 50 hours. Dan, age 15: \$12 an hour, 12 hours, all after school.
2. Make a payroll table: Worker, Wage, Regular hours, Overtime hours, Regular pay, Overtime pay, Total pay.
3. Calculate each worker's pay. Overtime pay = overtime hours $\times$ wage $\times$ 1.5.
4. Add up the total payroll for the week and the total paid for overtime.
5. The owner needs 24 more hours of work next week. Compare two choices: give Ben and Carla 12 more overtime hours each, or hire a new part-time worker at \$15 an hour for 24 regular hours. Which costs less? What else should the owner think about (training, quality, tiredness)?
6. Dan, who is 15, is asked to work until 11 p.m. on a school night. With a parent, look up or discuss the rules for young workers in your state. Write what the payroll clerk should tell the owner.
7. Check your warm-up answer: was it the same as the FLSA rule gives? Explain the difference.
8. Write a paragraph: How does overtime pay protect workers? How might it change an owner's choices?

Tips

- Only hours over 40 are overtime. A 46-hour week has 40 regular hours and 6 overtime hours.
- Ben: $40 \times \$18 = \$720$, plus $6 \times \$18 \times 1.5 = \$162$, total \$882. Check your work against this example.

Check your work

- ☐ I can calculate weekly pay with overtime at time and a half.
- ☐ I can state what the FLSA of 1938 required.
- ☐ I can explain why the FLSA lasted while the 1933 industry codes failed.

LEDGER NOTEBOOK

1. Make a timeline: 1911 Triangle fire; 1926 Ford's five-day week; 1933 Perkins becomes Secretary of Labor and the industry codes begin; 1935 codes struck down; June 25, 1938 FLSA signed; 1940 the 40-hour week in full effect.
2. Make a two-column chart comparing the 1933 industry codes and the 1938 FLSA: What each controlled, Who it helped, Who it hurt, How long it lasted.
3. Copy the overtime formula in a box and work one example of your own.
4. Write the story of Jacob Maged the tailor in five sentences. Was that rule a fair referee?

From history. Frances Perkins later said that when she was asked to join the cabinet in 1933, she agreed only after the President promised to support a list of goals she had written down, including limits on hours, an end to child labor and a wage floor. The Fair Labor Standards Act fulfilled several of them.

COMMON MISTAKES

- Counting every hour at time and a half. Only hours beyond 40 in a week are overtime.
- Thinking the 1938 law covered everyone. At first it covered only about one worker in five; it has been widened since.
- Thinking all labor rules are alike. A simple rule with clear limits is very different from a rule that tries to control a whole industry's prices.

Make it a game • Payroll Clerk Sprint. Your parent calls out a worker's hours and hourly wage, such as 46 hours at 8 dollars. You compute the weekly pay with time and a half after forty hours. Do five problems in a three-minute sprint and check against a wage floor. Say how Frances Perkins and Henry Ford's five-day week led to the FLSA.

Scripture. “Six days shalt thou labour, and do all thy work:” (Exodus 20:9, KJV)

God commanded work and also set a limit on it, with a day of rest for every worker, servant and stranger. Laws that limit hours echo this ancient pattern: work is good, and so is rest.

UNIT 5

WORKERS, OWNERS AND FAIR RULES

The first factories made goods cheaper for everyone and gave many people steady wages, but they also brought long hours, dangerous machines and children at work. In this unit you will look closely at both sides through the young women who worked in the cotton mills of Lowell, Massachusetts, in the 1830s and 1840s. Then you will study how people worked to set things right, and what it cost: Lord Shaftesbury, an evangelical Christian, and the British Factory Acts; Samuel Gompers and the trade unions that bargained peacefully for better pay and hours; and the Fair Labor Standards Act of 1938, which set the forty-hour week with overtime pay and ended most child labor in American industry.

You will also see a rule that went wrong: the codes of 1933 that fixed prices for whole industries and fined small shopkeepers for charging too little. Throughout, keep in mind the Bible's teaching for both sides: owners must pay fair wages on time and keep their promises (Deuteronomy 24:14-15; James 5:4), and workers must work heartily (Colossians 3:23). Good rules act like a fair referee. They protect honest dealing, safety and children and keep any one side from abusing its power, while leaving people free to work, trade, build and give.

PREREQUISITES

- Knows capital and labor, the Factory Act of 1833 and Lewis Hine simply (Grade 5, Unit 5)
- Knows the factory system and productivity (Unit 1)
- Can multiply hours by wages and calculate a percent

MASTERY CHECKLIST

- ☐ I can describe both the gains and the costs of factory work for the mill girls of Lowell.
- ☐ I can explain what the Factory Acts of 1833 and 1847 required, why Lord Shaftesbury fought for them and what they cost.
- ☐ I can explain collective bargaining and how Samuel Gompers's unions sought better wages and hours by agreement.
- ☐ I can calculate weekly pay with overtime under the Fair Labor Standards Act of 1938.
- ☐ I can tell the difference between a rule that acts as a fair referee and one that backfires, with an example of each.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **A New England Girlhood, by Lucy Larcom (1889)**: Free at Project Gutenberg. Lucy Larcom went to work in a Lowell mill at eleven and later became a teacher and poet. Read her chapters on mill life with Lesson 5.1. Ages 11 and up.
- **Loom and Spindle, by Harriet H. Robinson (1898)**: Free at Project Gutenberg. A former mill girl's memories of Lowell, the boardinghouses and the magazine the workers wrote, *The Lowell Offering*. A parent can choose a chapter to read aloud with Lesson 5.1.
- **Lowell National Historical Park (National Park Service)**: Free. Photographs, maps and short articles about the mills, the canals and the workers. If you live nearby, the park's weave room runs real power looms.

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 The Mill Girls of Lowell: The Gains and Costs of Factory Work

2 sessions of 50 minutes

5.2 The Factory Acts and Lord Shaftesbury

2 sessions of 50 minutes

5.3 Samuel Gompers and the Trade Unions

2 sessions of 50 minutes

5.4 The Fair Labor Standards Act of 1938: The Forty-Hour Week

2 sessions of 50 minutes

UNIT 5 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. **8 pts**

Why did the Lowell mill owners hire young women from New England farms, and what did they do to win their parents' trust?

2. **10 pts**

A mill worker earns \$3.20 a week for 64 hours and pays \$1.40 a week for board. What does she earn per hour? What does she keep each week, and in a 50-week year?

3. **8 pts**

What did the Lowell workers' petition of 1845 ask for, and what did the Massachusetts legislature do?

4. **8 pts**

Name three things the Factory Act of 1833 required. Which part made it work better than earlier laws?

5. (8 pts)

A worker makes 9 items an hour in a 12-hour day. After the Ten Hours Act, rested, she makes 10 items an hour in a 10-hour day. By what percent did hours fall, and by what percent did output fall?

6. (8 pts)

Who was Lord Shaftesbury, and why did he work for factory reform?

7. (8 pts)

What was Samuel Gompers's "pure and simple" unionism?

8. (10 pts)

A worker earns \$24 an hour and makes 12 parts an hour. Find the labor cost per part. If wages rise to \$27 and output rises to 13.5 parts an hour, what is the new labor cost per part?

9. (8 pts)

What happened at Homestead in 1892, and what lesson did it teach?

10. (10 pts)

Under the FLSA, a worker earning \$14 an hour works 47 hours in a week. Calculate her pay.

11. (6 pts)

Name the three main things the Fair Labor Standards Act of 1938 required.

12. (8 pts)

Short answer: Compare the 1933 industry codes with the 1938 FLSA. Which acted more like a fair referee, and why?

ANSWER KEY

1. New England had few landless workers, and young farm women were available and capable. The owners built boardinghouses run by respectable keepers, with curfews and an expectation of church attendance, and paid wages in cash that were higher than other jobs open to women.
2. Per hour: $\$3.20 \div 64 = \$0.05$ (5¢). She keeps $\$3.20 - \$1.40 = \$1.80$ a week; $\$1.80 \times 50 = \$90.00$ a year.
3. It asked for a ten-hour working day. The legislature held hearings, the first government inquiry into working conditions in America, but did not pass a law.
4. Any three: no children under nine in most textile mills; children 9–13 limited to 9 hours a day and 48 a week; young people 13–18 limited to 12 hours a day and 69 a week; two hours of school a day for the younger children; four factory inspectors. The inspectors made it work, because they could enter mills and bring cases.
5. Hours: $(12 - 10) \div 12 \times 100 \approx 16.7\%$. Output before $9 \times 12 = 108$; after $10 \times 10 = 100$; fall $(108 - 100) \div 108 \times 100 \approx 7.4\%$.
6. Anthony Ashley-Cooper, Lord Ashley and later the 7th Earl of Shaftesbury, a member of Parliament and evangelical Christian who led the campaigns for the Factory Acts, the Mines Act and other reforms. He believed his faith required him to defend the weak and the poor.
7. A practical approach that focused on wages, hours and working conditions, won through collective bargaining and written contracts with employers, rather than through grand schemes to remake society or violence.
8. Before: $\$24 \div 12 = \$2.00$ per part. After: $\$27 \div 13.5 = \$2.00$ per part. Wages rose 12.5%, but because productivity rose 12.5% too, the cost per part did not change.
9. Carnegie Steel and the steelworkers' union could not agree on a contract; the manager locked out the union workers and brought in hired guards, a violent clash followed, the militia was sent, and the union was broken. It taught that when both sides refuse to bargain fairly, everyone suffers great harm.
10. Regular: $40 \times \$14 = \$560$. Overtime: $7 \times \$14 \times 1.5 = \$147$. Total: $\$707$.
11. A national wage floor (25¢ an hour at first, rising over time); a standard work week (falling to 40 hours by 1940) with overtime at time and a half; and limits on child labor (no most factory and mine work under 16, no hazardous work under 18).

12. The 1933 codes tried to fix prices, wages and output for whole industries, protected large firms and punished small shopkeepers like the tailor Jacob Maged for charging less; they were struck down in 1935. The FLSA set a few clear limits on hours, pay and child labor and left businesses free to make, price and sell. The FLSA acted more like a fair referee. (Accept any well-reasoned answer.)

PORTFOLIO PIECE: A FAIR-RULES CASE FILE

Choose one rule or agreement from this unit: the Factory Act of 1833, the Ten Hours Act of 1847, a union contract, the Fair Labor Standards Act of 1938 or the industry codes of 1933. Build a case file of one to two pages with five headings: The problem (who was harmed and how, with at least one number), The people (who argued for it and who against, and their reasons), The rule (what it required and how it was enforced), The results (what changed, with at least one number or date) and The cost (who paid, and how). End with your judgment: did this rule act like a fair referee, too few rules or too many? Add a timeline and one captioned picture or drawing.

LOOK FOR	WHAT IT MEANS
Accuracy	Names, dates, numbers and requirements are correct and come from the lessons or reliable sources.
Fairness	Presents the arguments of both supporters and opponents honestly, and counts both the benefits and the costs.
Reasoning	The final judgment is clearly explained using the idea of a fair referee.
Presentation	Five clear headings, a timeline, a captioned picture and neat, complete sentences.

ENTREPRENEURSHIP AND SALES

An **entrepreneur** sees a need, makes a plan, takes a risk and serves customers. In this unit you will learn the tools entrepreneurs use to turn an idea into a business. You will write a **business plan**, starting from the letter a Nevada tailor named Jacob Davis wrote to his cloth supplier, Levi Strauss, in 1872 about a new kind of work pants. You will do **market research**, the way Charles Coolidge Parlin first studied what American families actually bought.

Then you will learn the **four P's of marketing**, product, price, place and promotion, through the story of H. J. Heinz, who sold pickles and ketchup in clear glass jars so customers could see they were pure. Last, you will see how Richard Sears and Julius Rosenwald brought the store to millions of farm families with the Sears, Roebuck catalog and a promise: satisfaction or your money back. In every lesson the rule is the same: honest persuasion serves the customer. "Lying lips are abomination to the LORD: but they that deal truly are his delight" (Proverbs 12:22).

PREREQUISITES

- Knows the entrepreneur's risk, prototypes, honest selling and break-even simply (Grade 5, Unit 6)
- Knows demand and elasticity (Unit 3)
- Can calculate percents, averages and simple profit

MASTERY CHECKLIST

- ☐ I can name the parts of a business plan and write a one-page plan with start-up costs, a price and a break-even point.
- ☐ I can design a fair survey, tally the results and turn them into percents.
- ☐ I can explain the four P's of marketing, using H. J. Heinz as an example.
- ☐ I can explain how the Sears, Roebuck catalog solved the problem of "place" for farm families and earned their trust.
- ☐ I can tell the difference between honest persuasion and deception.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Biz Kid\$ (PBS)**: Free videos and lesson ideas from the public-television series about young entrepreneurs and money. Watch the episodes on starting a business and on marketing with a parent. Ages 10 and up.
- **The Toothpaste Millionaire, by Jean Merrill (1972)**: A funny novel about a sixth grader who starts a toothpaste business, does his own market research and sets an honest price. Look for it at your library or the publisher, Houghton Mifflin Harcourt. Ages 9–12.

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 The Business Plan: Jacob Davis's Letter and the Riveted Pants

2 sessions of 50 minutes

6.2 Market Research: Asking Before You Build

2 sessions of 50 minutes

6.3 The Four P's of Marketing: H. J. Heinz and the Pickle Pin

2 sessions of 50 minutes

6.4 Reaching the Customer: The Sears, Roebuck Catalog

2 sessions of 50 minutes

UNIT 6 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. **8 pts**

What did Jacob Davis invent, and why did he write to Levi Strauss in 1872?

2. **8 pts**

Name five parts of a business plan.

3. **10 pts**

You plan to sell greeting cards for \$2.00 each. Each card costs 50¢ in materials. Your fixed costs (stamps and a cutter) are \$36. Find the profit per card and the break-even point. What is your profit if you sell 40 cards?

4. **8 pts**

What is the difference between primary and secondary research? Give an example of each.

5. **8 pts**

Rewrite this leading question fairly: "Don't you think my homemade lemonade is better than store-bought?"

6. **8 pts**

In a survey, 12 of 40 people chose blueberry muffins, 20 chose banana and 8 chose bran. Find each percent.

7. **8 pts**

What lesson does the story of Charles Coolidge Parlin and the soup cans teach?

8. **10 pts**

Name the four P's of marketing and give an example of each from H. J. Heinz.

9. **8 pts**

Why did Heinz use clear glass jars, and what does this teach about honest marketing?

10. **8 pts**

How did Rural Free Delivery (1896) and parcel post (1913) help Sears, Roebuck?

11. **8 pts**

A coat costs \$8.00 at a local store. The catalog price is \$6.50 plus 90¢ shipping. Which is cheaper, by how much, and by what percent of the store price?

12. **8 pts**

Short answer: Why did Sears's money-back guarantee matter so much to farm families who had never seen the company?

ANSWER KEY

1. Work pants with copper rivets at the corners of the pockets so they would not tear. He wanted a patent but could not afford the fee, so he offered Strauss a share of the rights if Strauss would pay for it.
2. Any five: product or service; customers; competition; operations (how it will be made and sold); people; start-up costs and finances (price, profit, break-even); risks.
3. Profit per card = $\$2.00 - \$0.50 = \$1.50$. Break-even = $\$36 \div \$1.50 = 24$ cards. Selling 40: $40 \times \$1.50 = \$60 - \$36 = \$24$ profit.
4. Primary research is gathering your own new facts (a survey of 20 neighbors); secondary research is using facts others gathered (a government statistic or a trade magazine article).
5. For example: "Which would you rather buy: homemade lemonade or store-bought lemonade, or neither?" (Any neutral question that does not push toward an answer.)
6. Blueberry $12 \div 40 \times 100 = 30\%$; banana $20 \div 40 \times 100 = 50\%$; bran $8 \div 40 \times 100 = 20\%$.
7. What customers actually do can be different from what a business assumes, so a business should gather facts before deciding.
8. Product: pure horseradish, pickles and ketchup in clear glass. Price: fair prices ordinary families could pay. Place: salesmen and railroad shipping to grocers across the country. Promotion: pickle pins at the 1893 Chicago fair, the "57 Varieties" slogan, factory tours.
9. So customers could see his horseradish and pickles were pure, unlike rivals who hid fillers in colored glass. Honest marketing lets customers see the truth and builds a brand they trust.
10. Rural Free Delivery brought catalogs and mail to farm homes; parcel post carried packages cheaply to every address. Together they solved the problem of place for millions of farm customers.
11. Catalog full cost = $\$6.50 + \$0.90 = \$7.40$. It is cheaper by $\$8.00 - \$7.40 = \$0.60$, which is $0.60 \div 8.00 \times 100 = 7.5\%$.
12. They were sending money to a distant company and could not see or try the goods first. The guarantee promised that if they were not satisfied, they would

get their money back, which removed much of the risk and earned their trust. Keeping that promise built a loyal customer base.

PORTFOLIO PIECE: A COMPLETE PLAN FOR A SMALL BUSINESS

Combine your work from this unit into one booklet for a small business you could run with a parent: a one-page business plan with real costs and a break-even point (6.1), your survey with its tallies, percents and a graph (6.2), your four-P plan and your improved honest advertisement (6.3), and your catalog page with its guarantee (6.4). Finish with a one-page “banker’s letter” to a parent asking for a small start-up loan or investment, stating how much you need, what it is for, how and when you will repay it, and what the risks are.

LOOK FOR	WHAT IT MEANS
Completeness	All five parts are included: plan, survey, four P’s and ad, catalog page and banker’s letter.
Numbers	Costs, prices, profit per unit, break-even point and survey percents are correct and use real figures.
Honesty	Every claim in the advertisement and catalog page is true, and the risks are stated plainly.
Presentation	A neat booklet with headings, graphs and drawings, in clear, complete sentences.

6.1 THE BUSINESS PLAN: JACOB DAVIS'S LETTER AND THE RIVETED PANTS

OBJECTIVES

- Tell how Jacob Davis and Levi Strauss turned an idea for riveted work pants into a business.
- Name the main parts of a business plan.
- Calculate start-up costs, profit per unit and the break-even point.
- Write a one-page business plan for a small business you could really run.

Warm-up. Think of something that wears out too fast in your house: a backpack strap, a pocket, a shoelace. Write down why it fails and one idea to make it stronger. Who else might want your improvement?

WATCH

Writing a Business Plan: What You Need to Know | It's a Money Thing

Red Canoe Credit Union • 3:43

<https://www.youtube.com/watch?v=7ykkhepT9aE>

WHEN TO WATCH

After the story of Jacob Davis, before the big idea. List the parts of a plan as they are named.

Note: From a member-owned credit union's money-education series.

BACKUP VIDEO

20th May 1873: Levi Strauss and Jacob Davis secure the patent for riveted blue jeans

HistoryPod • 2:23

<https://www.youtube.com/watch?v=MpfdKZGr0u8>

With the story.

KEY TERMS

entrepreneur

A person who sees a need, organizes resources and takes the risk of starting a business to meet it.

business plan

A written description of a business: what it sells, to whom, how it will make and sell it, who will run it, what it will cost and how it will earn a profit.

start-up costs

The money needed to begin a business before any sales, such as tools, supplies, permits and a first batch of goods.

fixed costs and variable costs

Fixed costs stay the same however much you sell (tools, a booth fee); variable costs rise with each unit you make (ingredients, materials).

break-even point

The number of units you must sell to cover your fixed costs: $\text{break-even} = \text{fixed costs} \div (\text{price} - \text{variable cost per unit})$.

CORE IDEAS

The story. Jacob Davis was a tailor in Reno, Nevada, a rough railroad and mining town. He had been born in Riga, in what is now Latvia, and had come to America as a young man. Around 1870, a customer asked him to make a pair of pants strong enough for her husband, a laborer whose pockets kept tearing. Davis had an idea: he fastened the corners of the pockets with small copper rivets, the kind he used on horse blankets. The pants held. Soon other workers wanted riveted pants, and Davis was selling more than he could make. He bought his heavy cloth from a San Francisco wholesaler, Levi Strauss & Co. Worried that others would copy him, Davis wanted a patent, but he could not afford the fee. In 1872 he wrote Levi Strauss a letter: if Strauss would pay for the patent, the two would share the rights.

How they figured it out. Davis's letter was a kind of **business plan**. It described the product (work pants with riveted pockets), the customers (miners, teamsters, farmers and other laborers), the proof that they wanted it (his own sales), the risk (copying), and what he needed (money for the patent) and what he offered in return (a share). Strauss saw a good opportunity. He had the money, the cloth, the

warehouses and the salesmen; Davis had the idea and the skill. Their patent was granted on May 20, 1873. Davis moved to San Francisco to run the production, first with seamstresses sewing at home and then in a factory. The riveted “waist overalls” sold so well that they became the blue jeans worn around the world.

The big idea. A business plan answers a few questions in writing: What will I sell? Who will buy it, and why? Who else sells something like it? How will I make and sell it? Who will do the work? How much money do I need to start, and when will I make a profit? The numbers matter most. Suppose you plan to sell bookmarks. **Fixed costs:** a paper cutter and a booth fee, \$24. **Variable cost:** 20¢ of card and ribbon per bookmark. Price: \$1.00. Profit per bookmark = $\$1.00 - \$0.20 = \$0.80$. **Break-even point** = $\$24 \div \$0.80 = 30$ bookmarks. Sell 30 and you have paid for your start; every bookmark after that earns 80¢ of profit.

Think it through. Writing a plan shows you where your idea is weak before you spend money. If you must sell 300 bookmarks to break even and you know only 20 likely buyers, the plan has saved you from a loss. Jesus asked, “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). A plan is not a promise that you will succeed, but a careful count of the cost.

In business today. Banks and investors ask for a business plan before they lend or invest, and many small business owners write a short one every year to check their direction. The best plans are honest about risks. Like Davis and Strauss, many businesses begin as partnerships in which one person brings the idea and skill and another brings money, materials and a way to reach customers.

PICTURE STUDY



Patent Drawing for J. W. Davis's "Fastening Pocket-Openings", Jacob W. Davis (inventor); U.S. Patent Office record, 1873 · Ink drawing on paper · U.S. National Archives

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

Every patent application in the United States included a drawing that showed exactly what was new. This drawing, filed with Jacob Davis's application, shows the riveted pockets of the work pants. The patent, number 139,121, was granted to Davis and Levi Strauss & Co. on May 20, 1873.

Look closely

- Find the pockets on the overalls. Where are the rivets placed, and why there?
- Find the letters or labels on the drawing. What are they for?
- Find the signatures. Why would a patent need witnesses?

Talk about it

1. Why did Davis need a patent before he could build a business on his idea?
2. What did Davis bring to the partnership, and what did Levi Strauss bring?
3. If you were writing a business plan for these pants in 1872, who would your customers be, and how would you reach them?

Safety first. A parent must approve and supervise any real business. Sell only to people you and your parent know, never door to door to strangers, and check your town's rules for selling food.

PROJECT

My One-Page Business Plan

You will write a one-page business plan for a small business you could really run with a parent's help, with real costs and a break-even point. You will use this plan again in Unit 9 if you do the bonus business.

You will need

- Ledger notebook, pencil and calculator
- Store flyers or a parent's help to price supplies
- A parent to act as your "banker" and review the plan

Steps

1. Choose a business idea you could actually run: baked goods for neighbors you know, greeting cards, seedlings, bookmarks, pet sitting or yard help.
2. Write one or two sentences for each heading: Product or service; Customers (who, and why they would buy); Competition (who else sells it, and how you are different); Operations (how you will make it and sell it); People (who will do the work); Risks (what could go wrong).
3. List your start-up costs. Mark each as a fixed cost or a variable cost per unit. Find real prices with a parent.
4. Choose a price. Calculate profit per unit (price – variable cost) and your break-even point (fixed costs ÷ profit per unit).
5. Estimate how many you can sell in a month and calculate the expected profit: (units × profit per unit) – fixed costs.
6. Present your plan to your parent "banker" in five minutes. Answer his or her questions honestly.
7. Revise the plan once based on the banker's questions, and write what you changed and why.

Tips

- Use real prices, not guesses. A plan built on wishful numbers is worse than no plan.

- If your break-even point seems too high, look for ways to lower costs or to raise value, not just to raise the price.

Check your work

- ☐ My plan has all six headings and real numbers.
- ☐ I calculated start-up costs, profit per unit and the break-even point correctly.
- ☐ I revised my plan after honest questions.

LEDGER NOTEBOOK

1. Copy the bookmark example and work out the break-even point again with a price of \$1.25.
2. Draw a break-even graph: a flat line for fixed costs, a rising line for total costs, and a rising line for revenue. Mark where revenue crosses total costs.
3. Make a timeline: about 1870 Davis's first riveted pants; 1872 letter to Levi Strauss; May 20, 1873 patent; Davis moves to San Francisco to run production.
4. Write one sentence on what each partner, Davis and Strauss, brought to the business.

From history. Jacob Davis was not only an inventor but also a skilled production manager. He supervised the making of the riveted clothing for Levi Strauss & Co. for many years, and his son later worked for the company too. The company still marks its jeans with small copper rivets at the pocket corners.

COMMON MISTAKES

- Forgetting fixed costs. Profit per unit means nothing until the fixed costs are paid back.
- Thinking a business plan guarantees success. It shows you the risks so you can decide wisely.
- Writing a plan without asking any real customers. The next lesson shows how to find out what they want.

Make it a game • Break-Even Letter. You are Jacob Davis writing to Levi Strauss about riveted pants. In three sentences, tell your idea and your start-up costs. Then calculate how many pairs must sell to break even, given a made-up price and cost. Your parent plays Strauss and asks two questions. Answer well and win the partnership. Name the plan parts.

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 careful plan is the “thought of the diligent.” Rushing into a business without counting the cost often ends in want.

6.2 MARKET RESEARCH: ASKING BEFORE YOU BUILD

OBJECTIVES

- Tell how Charles Coolidge Parlin began modern market research in 1911.
- Tell the difference between primary and secondary research.
- Write fair survey questions, avoiding leading questions, and choose a sample.
- Tally survey results, turn them into percents and use them to make a decision.

Warm-up. Write two questions you could ask friends about a new cookie: one that would push them toward saying yes (“Wouldn’t you love a delicious chocolate cookie?”) and one that is fair (“Which of these three cookies would you most like to buy?”). Why does the fair question give more useful answers?

WATCH

How to Do Market Research!

Two Cents • 7:47

<https://www.youtube.com/watch?v=b-hDg7699S0>

WHEN TO WATCH

After the story of Parlin, before the big idea.

Note: From PBS’s personal-finance series *Two Cents*. Stop when the teaching ends.

BACKUP VIDEO

Market Research | The Purpose of Market Research Explained | Lego, Gymshark & Apple Examples

Two Teachers • 9:34

<https://www.youtube.com/watch?v=NSavcu-clS0>

After the project, for more examples of how companies use research.

KEY TERMS

market research

Gathering facts about customers, competitors and markets to make better business decisions.

primary research

New facts you gather yourself, by surveys, interviews, counting or watching.

secondary research

Facts others have already gathered, such as government statistics, trade reports or articles.

sample

The group of people you actually ask, chosen to stand for the larger group of possible customers.

leading question

A question worded to push people toward a certain answer, which makes the results less honest.

target market

The particular group of customers a business aims to serve.

CORE IDEAS

The story. In 1911 the Curtis Publishing Company of Philadelphia, which published popular magazines such as *The Saturday Evening Post* and the *Ladies' Home Journal*, wanted more companies to buy advertisements. But it could not tell advertisers much about who bought what. It hired a Wisconsin school principal named Charles Coolidge Parlin to find out. Parlin traveled thousands of miles, interviewing farm-implement dealers, department-store owners and shoppers, and counting what was sold where. His reports were among the first systematic market research in America, and he is often called the father of market research.

How they figured it out. One famous story about Parlin concerns canned soup. The Campbell Soup Company believed that working families made their own soup, so it saw little reason to advertise to them. Parlin, the story goes, arranged to collect and count the empty cans in the trash of different Philadelphia neighborhoods. He found that working families threw away many soup cans, because a busy mother had little time to make soup from scratch, while wealthy households with cooks bought fewer. Whether every detail of the story is exact, its lesson is sound: what people actually do can be different from what businesses assume. Parlin taught companies to gather facts before deciding.

The big idea. Market research has two kinds. **Primary research** is gathering your own facts: a survey, an interview, counting customers who walk past a stand, or a taste test. **Secondary research** uses facts others have gathered, like census figures or a trade magazine. A good survey asks a fair **sample** of the people in your **target market**, uses clear, neutral questions, and records answers honestly. Then you turn tallies into percents: if 18 of 30 people choose oatmeal cookies, that is $18 \div 30 \times 100 =$

60%. Be careful: asking only your best friends or asking **leading questions** will give you the answers you want, not the truth.

Think it through. Research does not replace judgment. Some of the best products were ones customers did not know they wanted until they saw them. But research protects a business from expensive mistakes, and it shows respect for customers by listening before speaking. “He that answereth a matter before he heareth it, it is folly and shame unto him” (Proverbs 18:13).

In business today. Companies use surveys, taste tests, sales records and online data to learn what customers want. A small business can do research too: ask regular customers what they would like, count which items sell out first and try a new product as a small test before making a lot of it. An honest business also protects the privacy of the people who answer its questions.

PICTURE STUDY



The Provider (La Pourvoyeuse), François-Bernard Lépicié, after Jean-Baptiste-Siméon Chardin, 1742 ·

Engraving · Metropolitan Museum of Art, New York

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

The French painter Chardin loved quiet scenes of everyday work in ordinary homes. This engraving, made in 1742 from one of his most famous paintings, shows a household servant who has just come home from buying the family's food at market. Every week, buyers like her decided which bakers and grocers would succeed.

Look closely

- Find what she has bought. What can you see on the sideboard and in her hands?
- Look at her face and posture. Is she tired, thoughtful, pleased?
- Look at the room behind her. What kind of household does she work for?

Talk about it

1. If you were a baker in her town, what would you want to know about how she chooses where to buy bread?
2. How could you find out without asking her leading questions?
3. Who is the real customer here: the servant who chooses and carries, or the family who pays? Why does that matter for market research?

Safety first. Survey only people you and your parent know, with a parent nearby. Do not collect anyone's address, phone number or other personal information.

PROJECT

A Real Market Survey

You will plan and carry out a fair survey of at least 20 people (with a parent) about a product you might sell at the family market day or in the bonus business, tally the results, turn them into percents and make a decision.

You will need

- A survey sheet with 4–6 questions
- Samples or pictures of 2–3 product choices (optional)
- Ledger notebook, colored pencils and calculator
- A parent to help choose people to ask (family, church friends, neighbors you know)

Steps

1. Decide what you need to know: which product, at what price, in what size or flavor, and when people would buy it.
2. Write 4–6 neutral questions. Include one multiple-choice question (“Which would you choose: A, B or C?”), one price question (“Would you buy this at \$1? At \$2?”) and one open question (“What would make this better?”).
3. Test the questions on one person and fix any that are confusing or leading.
4. Survey at least 20 people. Record answers exactly, without arguing or explaining your own preference.
5. Tally the answers to each multiple-choice question and turn each count into a percent of the total.
6. Make a bar graph or pie chart of your most important question.
7. Do one piece of secondary research with a parent: find the price of a similar product at a store or bakery.
8. Write a decision: Based on the facts, what will you make, at what price, and why? What surprised you?

Tips

- Twenty people is a small sample. Your results are a good clue, not a certainty.

- Never pressure anyone. A polite “No, thank you” is useful data too.

Check your work

- ☐ I can tell primary from secondary research.
- ☐ I wrote fair, neutral questions and surveyed at least 20 people.
- ☐ I turned tallies into percents and used them to make a decision.

LEDGER NOTEBOOK

1. Write three leading questions and rewrite each one as a fair question.
2. Copy your tally table with counts and percents. Check that the percents add up to about 100%.
3. Draw the soup-can study as a simple picture: two neighborhoods, two trash cans, and a count of soup cans in each.
4. What I would change: one sentence about how you would improve your survey.

From history. Charles Coolidge Parlin worked for the Curtis Publishing Company for more than twenty-five years. His team’s studies of the automobile, department-store and farm-implement industries were some of the first detailed reports on American markets, and many companies copied his methods by setting up research departments of their own.

COMMON MISTAKES

- Asking only people who love you. Friends and family may be too kind; ask a wider sample if you can.
- Asking leading questions. They give the answer you want instead of the truth.
- Forgetting to divide by the total when finding a percent.

Make it a game • Catch the Leading Question. Your parent reads six survey questions about a pretend lemonade stand, three fair and three leading. Raise a hand when you spot a leading question and rewrite it fairly. Then explain primary research and secondary research and tell how Parlin first studied customers in 1911. Swap, and write six questions yourself.

Scripture. “He that answereth a matter before he heareth it, it is folly and shame unto him.” (Proverbs 18:13, KJV)

A business that decides before it listens is foolish. Market research is a disciplined way of hearing customers before answering them with a product.

6.3 THE FOUR P'S OF MARKETING: H. J. HEINZ AND THE PICKLE PIN

OBJECTIVES

- Tell how Henry J. Heinz built his food company on purity, honesty and clever promotion.
- Explain the four P's of marketing: product, price, place and promotion.
- Tell the difference between honest persuasion and deception in advertising.
- Plan the four P's for a real product and design an honest advertisement.

Warm-up. Look at the labels on three jars or bottles in your kitchen. Which ones let you see the food inside? What words on each label are meant to make you trust it? Write down the one you trust most and why.

WATCH

The 4 Ps of The Marketing Mix Simplified

[College & Career Ready Labs | Paxton Patterson](#) · 2:47

<https://www.youtube.com/watch?v=Mco8vBAwOmA>

WHEN TO WATCH

After the story of Heinz, before the big idea. Write the four P's in your notebook.

BACKUP VIDEO

Marketing Mix 4Ps | McDonald's Examples

[Two Teachers](#) · 7:51

<https://www.youtube.com/watch?v=M8nC4dgKB9g>

After the project, for a worked example of all four P's for one company.

KEY TERMS

marketing

Everything a business does to understand its customers and bring its products to them: choosing the product, the price, the place and the promotion.

the four P's

Product (what you sell), price (what you charge), place (where and how customers can get it) and promotion (how you tell them about it).

brand

A name, symbol or design that customers recognize and trust to stand for a certain quality.

promotion

Advertising, displays, samples and other ways of telling customers about a product and persuading them to try it.

deceptive advertising

Advertising that misleads customers with false claims, hidden facts or tricks; it is wrong and, in most cases, against the law.

CORE IDEAS

The story. Henry John Heinz grew up near Pittsburgh, Pennsylvania, and as a boy sold extra vegetables from his mother's garden to neighbors. In 1869, at twenty-five, he started a business bottling horseradish. Many sellers of his time used green or brown glass to hide cheap fillers like turnip and wood fibers in their horseradish. Heinz used clear glass so customers could see that his was pure. In 1875, during a hard economic time, his business failed and he went bankrupt, a painful disgrace. The next year he started again with his brother and a cousin, adding pickles and, in 1876, ketchup. He kept a list of the people his first company had owed, and as the new business prospered he paid them back, even though the law no longer required it.

How they figured it out. Heinz was a master of **promotion**. At the great World's Columbian Exposition in Chicago in 1893, his booth was on an upper floor where few visitors went. So he had small cards scattered around the fair, offering a free gift at the Heinz booth. Crowds climbed the stairs to collect a small pin shaped like a pickle, and taste his foods. Hundreds of thousands of pickle pins were given away. In 1896, riding a train in New York, he saw an advertisement for "21 styles" of shoes and created his own slogan, "57 Varieties," though the company already made more than 57 products. He invited the public to tour his clean, bright factories and see the food being made, and in 1906 he supported the Pure Food and Drug Act when many food makers opposed it.

The big idea. Marketing experts later summed up a business's choices as **the four P's**. **Product:** Heinz sold pure, consistent foods in clear jars. **Price:** fair prices that ordinary families could pay, set to cover costs and earn a profit. **Place:** he sent

salesmen to grocers across the country and later around the world, with railroad cars to carry the goods. **Promotion:** pickle pins, the “57 Varieties” slogan, factory tours, samples and signs. All four must fit together. A wonderful product at the wrong price, or in the wrong place, or that no one hears about, will not sell.

Think it through. Promotion can be honest or dishonest. Honest promotion tells true things in an attractive way and helps customers find what they need. **Deceptive advertising** hides the truth, exaggerates or tricks people. Heinz built his **brand** on letting customers see the truth for themselves, through clear glass and open factory doors. “Lying lips are abomination to the LORD: but they that deal truly are his delight” (Proverbs 12:22).

In business today. Every business makes four-P decisions, from a lemonade stand (fresh lemonade, 50¢, at the end of the driveway on hot Saturdays, with a hand-painted sign) to a large food company. Laws against false advertising help, but the best protection is a business owner who would never claim what is not true. Henry Heinz, an active Sunday-school teacher and leader for most of his life, said he wanted his company to be known for honesty.

PICTURE STUDY



Bottling Heinz Pickles: An Advertising Card, H. J. Heinz Company, about 1905 · Color-printed advertising card

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

Heinz gave away colorful cards like this one to customers. It shows women in the Pittsburgh factory packing pickles into clear glass jars, the “57 Varieties” slogan, and a Heinz delivery wagon. It is both a picture of real work and a piece of promotion.

Look closely

- Count the workers. What is each one doing?
- Find the jars. Why would clear glass matter to customers?
- Find the slogan and the delivery wagon. Which of the four P’s does each one show?
- Look at the colors and decorations. What did Heinz want customers to feel when they saw this card?

Talk about it

1. Which of the four P’s does this card show best? Can you find all four?
2. Is this honest promotion? What would you check in a real factory to be sure the picture is true?

3. What would you want to know about these workers' pay and hours before giving Heinz a stakeholder score for workers?

PROJECT

Plan the Four P's and Make an Honest Ad

You will plan the four P's for the product you researched in Lesson 6.2, make an honest advertisement, and test it on a few people to see whether it is both appealing and true.

You will need

- Your survey results from Lesson 6.2
- Poster board or paper, markers and a ruler
- Ledger notebook and calculator

Steps

1. Write your four P's in a table. Product: what exactly will you sell, in what size and packaging? Price: what will you charge, based on your costs and survey? Place: where and when will customers find it? Promotion: how will they hear about it?
2. Check that the four fit together. For example, a \$5 price may not fit a product sold to children at a lemonade stand.
3. Calculate your profit per unit at your chosen price (price – variable cost per unit) and your break-even point if you have fixed costs.
4. Design a sign or flyer. Include the product, the price and one honest reason to buy it. Use no claim you cannot prove.
5. Design one “pickle pin” idea: a small, honest, inexpensive way to get people to notice and try your product, such as a free sample or a tasting.
6. Show your ad to three people (with a parent). Ask: What do you think this product is? Do you believe what it says? Would you stop to look? Record the answers.
7. Improve the ad once based on what you learned, and write what you changed and why.

Tips

- Words like “best,” “healthiest” and “famous” must be true. “Fresh today” is a fine claim if it really is.

- A clear price on the sign is honest and saves customers from feeling pressured.

Check your work

- ☐ I can name and explain the four P's.
- ☐ My plan's four P's fit together and include real numbers.
- ☐ My advertisement is attractive and contains only true claims.

LEDGER NOTEBOOK

1. Make a four-P chart for Heinz in 1900 and for one product you buy often.
2. Draw a pickle pin and write a sentence about why such a small gift was such good promotion.
3. Write two advertisements for the same product: one honest and one deceptive. Then explain exactly what makes the second one wrong.
4. Make a timeline: 1869 horseradish in clear glass; 1875 bankruptcy; 1876 a new start and ketchup; 1893 pickle pins at Chicago; 1896 "57 Varieties"; 1906 Pure Food and Drug Act.

From history. Heinz opened his Pittsburgh factories to visitors, and by the early 1900s tens of thousands of people toured them each year, watching pickles packed and ketchup bottled and tasting samples at the end. Few food companies of that time dared to let the public see inside, and the tours became one of Heinz's best advertisements.

COMMON MISTAKES

- Thinking marketing means only advertising. Promotion is only one of the four P's.
- Thinking a clever slogan can make up for a poor product. Heinz's promotion worked because the product was good.
- Thinking a little exaggeration is harmless. Customers who are fooled once seldom come back.

Make it a game • Mystery Bag Marketing. Put ten household items in a bag. Draw one and, in ninety seconds, fill in the four P's for it: product, price, place and promotion. Make an honest slogan, not a deceptive one. Your parent asks one hard question. Then tell how H. J. Heinz used purity and a pickle pin to promote his brand.

Scripture. “Lying lips are abomination to the LORD: but they that deal truly are his delight.” (Proverbs 12:22, KJV)

Heinz’s clear jars and open factory doors were a way of dealing truly with customers. Honest marketing pleases God and builds a lasting brand.

6.4 REACHING THE CUSTOMER: THE SEARS, ROEBUCK CATALOG

OBJECTIVES

- Tell how Richard Sears and Alvah Roebuck began a mail-order business and how Julius Rosenwald built it into the largest retailer in America.
- Explain how the catalog, Rural Free Delivery and parcel post solved the problem of “place” for farm families.
- Explain why a money-back guarantee helped distant customers trust the company.
- Compare the total cost of buying from a catalog and from a local store, including shipping.

Warm-up. Imagine you live on a farm thirty miles from the nearest town in 1890, with no car and only one small general store nearby. You need new work boots. List your choices, and what each would cost you in money, time and trouble.

WATCH

Economic History: Miracle of the Mail Order Catalogue

Strange World of Econ · 6:48

https://www.youtube.com/watch?v=VNTN_LbEpW8

WHEN TO WATCH

After the story, before the big idea.

BACKUP VIDEO

The Life and Times of Richard Warren Sears - Sears, Roebuck and Company Co-Founder

Retail Rewind · 4:50

<https://www.youtube.com/watch?v=3ZuVMnZsac4>

With the story of Richard Sears.

KEY TERMS

mail order

Selling goods by catalog, with customers ordering by mail and receiving the goods by mail, express or rail.

distribution

How goods get from the maker or seller to the customer: warehouses, trucks, trains, mail and stores.

Rural Free Delivery

The U.S. Post Office's service, begun in 1896, of delivering mail free to farm homes instead of making farmers fetch it in town.

parcel post

The Post Office's package-delivery service, begun on January 1, 1913, which carried larger packages to every address.

guarantee

A promise that a product will satisfy the buyer, or the seller will fix it, replace it or return the money.

CORE IDEAS

The story. In 1886 Richard Sears was a young railroad station agent in North Redwood, Minnesota. A shipment of gold-filled watches arrived for a local jeweler who refused it. Sears bought the watches himself and sold them at a profit to other station agents up and down the line. Soon he started a watch business, hired a watchmaker named Alvah Roebuck to repair watches, and began selling by mail. By 1893 the company was called Sears, Roebuck and Co., and its catalog sold not only watches but clothing, tools, stoves, sewing machines, buggies and much more, to farm families who had few stores nearby. In 1895 a Chicago clothing merchant named Julius Rosenwald bought a share of the business; he later became its president and turned it into a well-organized giant.

How they figured it out. The great problem was **place**: how to get goods to millions of customers far from any city. Farm families often had only a small general store, with few choices and high prices. The catalog brought the choice of a city store to every farmhouse, and railroads carried the goods. Then the Post Office helped. **Rural Free Delivery**, begun in 1896, brought the catalog and the mail to farm doors, and **parcel post**, begun in 1913, carried packages cheaply. In 1906 Sears opened a huge

mail-order plant in Chicago where orders moved through the building on a carefully timed schedule, so that thousands could be filled each day. There was a second problem: trust. Why would a farmer send money to a company he had never seen? Sears promised “Satisfaction guaranteed or your money back,” printed honest descriptions, and answered letters in plain, friendly language.

The big idea. Distribution, the “place” of the four P’s, can matter as much as the product. A good product the customer cannot reach does him no good. To compare a catalog with a local store, add up the full cost: price + shipping + the value of time and travel. Example with practice numbers: boots cost \$3.00 at the general store. The catalog price is \$2.25, and shipping is 35¢, so the catalog costs \$2.60, which saves 40¢, or $40 \div 300 \times 100 \approx 13\%$. But if the boots do not fit and must be sent back, the saving shrinks, which is why the **guarantee** mattered so much.

Who gained? Customers gained wide choice and lower prices. Workers found jobs in the plants. Many small-town storekeepers were hurt, and some organized campaigns against “mail-order houses,” but many improved their own stores to compete. Sears sold everything from sewing machines to complete kit houses: from 1908 to 1940 it sold tens of thousands of houses whose numbered pieces arrived by train. In 1925, as cars made it easy for farm families to drive to town, Sears opened its first retail stores, adapting again to where its customers were.

In business today. Online stores are the catalog’s modern heirs, and companies still compete on how fast and cheaply they can deliver. The same old questions still matter: Can the customer reach the product easily? Can he trust a seller he cannot see? Will the seller make it right if something goes wrong? Like “the merchants’ ships” of Proverbs 31:14, good distribution brings what families need “from afar.”

PICTURE STUDY



The Sears, Roebuck and Company Mail Order Plant, Chicago, Historic American Buildings Survey (U.S. government photograph), 20th century photograph of buildings opened in 1906 · Photograph · Library of Congress, Washington, D.C.

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

Sears opened its great mail-order plant on Chicago's West Side in 1906. Its buildings held printing presses for the catalogs, offices for the clerks who read the orders, and miles of shelves and chutes for the goods. A government survey of historic buildings later photographed it to keep a record.

Look closely

- Find the tower. What might a tall tower be used for besides showing off the company's name?
- Count the buildings you can see. What do you think happened in each one?
- Look at the street, the trees and the size of the buildings. How many workers do you think a plant this size needed?

Talk about it

1. Which of the four P's did these buildings serve most?
2. How did the railroad, the Post Office and these buildings work together to bring a pair of boots to a farmhouse?
3. Which stakeholders gained from this plant, and which might have lost?

Safety first. Look at online stores only with a parent, and never enter names, addresses, passwords or card numbers. Your catalog page is for practice; any real orders go through a parent.

PROJECT

Catalog or Store? A Full-Cost Comparison

You will compare the full cost of buying five items locally and by delivery (with a parent, using a real store and a real catalog or website), and then design one catalog page for your own product, with an honest description and a guarantee.

You will need

- A store flyer or a trip to a local store with a parent
- A catalog or a store website (viewed with a parent)
- Ledger notebook, calculator, paper and markers

Steps

1. Choose five items your family really buys. For each, find the price at a local store and the price from a catalog or online seller.
2. Find the shipping cost for the delivered items (or the free-shipping rule).
3. Estimate the cost of the trip to the store: miles $\times$ a mileage cost your parent gives you (or a fixed amount for the trip), plus time.
4. Make a table: Item, Store price, Delivered price, Shipping, Full store cost, Full delivered cost, Difference.
5. Calculate the percent saved or lost for each item: $(\text{store cost} - \text{delivered cost}) \div \text{store cost} \times 100$.
6. Write which way is cheaper for each item, and name one reason beyond price (speed, trying it on, helping a local business).
7. Design one catalog page for the product you planned in Lessons 6.1–6.3: a drawing, an honest description, the price, how to order and a guarantee you could really keep.

Tips

- Count everything: the cheapest price is not always the lowest full cost.
- A guarantee is a promise. Write only one you could keep with your own money.

Check your work

- ☐ I calculated full costs, including shipping and travel, and percent differences.
- ☐ I can explain how Sears solved the problem of place and the problem of trust.
- ☐ My catalog page has an honest description, a clear price and a guarantee I could keep.

LEDGER NOTEBOOK

1. Draw the journey of an order in 1913: a farm family's letter, the mail, the Chicago plant, the railroad, parcel post and the farmhouse door. Label each step.
2. Make a timeline: 1886 Sears sells watches; 1887 Roebuck joins; 1893 Sears, Roebuck and Co.; 1895 Rosenwald; 1896 Rural Free Delivery; 1906 Chicago plant; 1908 houses by mail; 1913 parcel post; 1925 first stores.
3. Copy the boot example and work it again with shipping of 60¢. Is the catalog still cheaper?
4. Write the guarantee you put on your catalog page and one sentence on how you would keep it.

From history. Farm families wrote all kinds of letters to Sears, not only orders but questions, thanks and requests for advice, and the company answered them. Many children grew up turning the pages of the catalog, and some rural schools used old catalogs to teach reading and arithmetic.

COMMON MISTAKES

- Comparing only prices and forgetting shipping, travel and time.
- Thinking “place” means only a store's address. It means every way a product reaches the customer.
- Thinking a guarantee costs a business nothing. It costs money when it is used, and it earns trust that brings far more sales.

Make it a game • Catalog or Store. Your parent plays a farm family far from town. For each item, they give a store price and a long trip's cost against a catalog price plus shipping and waiting time. You work out the full cost and decide. Five rounds. Then say how Rural Free Delivery and parcel post solved the problem of place.

Scripture. “She is like the merchants’ ships; she bringeth her food from afar.” (Proverbs 31:14, KJV)

The wise woman of Proverbs plans how to bring good things to her household from far away. Good distribution, by ship, train or mail, is a real service to families.

ENTREPRENEURSHIP AND SALES

An **entrepreneur** sees a need, makes a plan, takes a risk and serves customers. In this unit you will learn the tools entrepreneurs use to turn an idea into a business. You will write a **business plan**, starting from the letter a Nevada tailor named Jacob Davis wrote to his cloth supplier, Levi Strauss, in 1872 about a new kind of work pants. You will do **market research**, the way Charles Coolidge Parlin first studied what American families actually bought.

Then you will learn the **four P's of marketing**, product, price, place and promotion, through the story of H. J. Heinz, who sold pickles and ketchup in clear glass jars so customers could see they were pure. Last, you will see how Richard Sears and Julius Rosenwald brought the store to millions of farm families with the Sears, Roebuck catalog and a promise: satisfaction or your money back. In every lesson the rule is the same: honest persuasion serves the customer. "Lying lips are abomination to the LORD: but they that deal truly are his delight" (Proverbs 12:22).

PREREQUISITES

- Knows the entrepreneur's risk, prototypes, honest selling and break-even simply (Grade 5, Unit 6)
- Knows demand and elasticity (Unit 3)
- Can calculate percents, averages and simple profit

MASTERY CHECKLIST

- ☐ I can name the parts of a business plan and write a one-page plan with start-up costs, a price and a break-even point.
- ☐ I can design a fair survey, tally the results and turn them into percents.
- ☐ I can explain the four P's of marketing, using H. J. Heinz as an example.
- ☐ I can explain how the Sears, Roebuck catalog solved the problem of "place" for farm families and earned their trust.
- ☐ I can tell the difference between honest persuasion and deception.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Biz Kid\$ (PBS):** Free videos and lesson ideas from the public-television series about young entrepreneurs and money. Watch the episodes on starting a business and on marketing with a parent. Ages 10 and up.
- **The Toothpaste Millionaire, by Jean Merrill (1972):** A funny novel about a sixth grader who starts a toothpaste business, does his own market research and sets an honest price. Look for it at your library or the publisher, Houghton Mifflin Harcourt. Ages 9–12.

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 The Business Plan: Jacob Davis's Letter and the Riveted Pants

2 sessions of 50 minutes

6.2 Market Research: Asking Before You Build

2 sessions of 50 minutes

6.3 The Four P's of Marketing: H. J. Heinz and the Pickle Pin

2 sessions of 50 minutes

6.4 Reaching the Customer: The Sears, Roebuck Catalog

2 sessions of 50 minutes

UNIT 6 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. **8 pts**

What did Jacob Davis invent, and why did he write to Levi Strauss in 1872?

2. **8 pts**

Name five parts of a business plan.

3. **10 pts**

You plan to sell greeting cards for \$2.00 each. Each card costs 50¢ in materials. Your fixed costs (stamps and a cutter) are \$36. Find the profit per card and the break-even point. What is your profit if you sell 40 cards?

4. **8 pts**

What is the difference between primary and secondary research? Give an example of each.

5. **8 pts**

Rewrite this leading question fairly: "Don't you think my homemade lemonade is better than store-bought?"

6. **8 pts**

In a survey, 12 of 40 people chose blueberry muffins, 20 chose banana and 8 chose bran. Find each percent.

7. **8 pts**

What lesson does the story of Charles Coolidge Parlin and the soup cans teach?

8. **10 pts**

Name the four P's of marketing and give an example of each from H. J. Heinz.

9. **8 pts**

Why did Heinz use clear glass jars, and what does this teach about honest marketing?

10. **8 pts**

How did Rural Free Delivery (1896) and parcel post (1913) help Sears, Roebuck?

11. **8 pts**

A coat costs \$8.00 at a local store. The catalog price is \$6.50 plus 90¢ shipping. Which is cheaper, by how much, and by what percent of the store price?

12. **8 pts**

Short answer: Why did Sears's money-back guarantee matter so much to farm families who had never seen the company?

ANSWER KEY

1. Work pants with copper rivets at the corners of the pockets so they would not tear. He wanted a patent but could not afford the fee, so he offered Strauss a share of the rights if Strauss would pay for it.
2. Any five: product or service; customers; competition; operations (how it will be made and sold); people; start-up costs and finances (price, profit, break-even); risks.
3. Profit per card = $\$2.00 - \$0.50 = \$1.50$. Break-even = $\$36 \div \$1.50 = 24$ cards. Selling 40: $40 \times \$1.50 = \$60 - \$36 = \$24$ profit.
4. Primary research is gathering your own new facts (a survey of 20 neighbors); secondary research is using facts others gathered (a government statistic or a trade magazine article).
5. For example: "Which would you rather buy: homemade lemonade or store-bought lemonade, or neither?" (Any neutral question that does not push toward an answer.)
6. Blueberry $12 \div 40 \times 100 = 30\%$; banana $20 \div 40 \times 100 = 50\%$; bran $8 \div 40 \times 100 = 20\%$.
7. What customers actually do can be different from what a business assumes, so a business should gather facts before deciding.
8. Product: pure horseradish, pickles and ketchup in clear glass. Price: fair prices ordinary families could pay. Place: salesmen and railroad shipping to grocers across the country. Promotion: pickle pins at the 1893 Chicago fair, the "57 Varieties" slogan, factory tours.
9. So customers could see his horseradish and pickles were pure, unlike rivals who hid fillers in colored glass. Honest marketing lets customers see the truth and builds a brand they trust.
10. Rural Free Delivery brought catalogs and mail to farm homes; parcel post carried packages cheaply to every address. Together they solved the problem of place for millions of farm customers.
11. Catalog full cost = $\$6.50 + \$0.90 = \$7.40$. It is cheaper by $\$8.00 - \$7.40 = \$0.60$, which is $0.60 \div 8.00 \times 100 = 7.5\%$.
12. They were sending money to a distant company and could not see or try the goods first. The guarantee promised that if they were not satisfied, they would

get their money back, which removed much of the risk and earned their trust. Keeping that promise built a loyal customer base.

PORTFOLIO PIECE: A COMPLETE PLAN FOR A SMALL BUSINESS

Combine your work from this unit into one booklet for a small business you could run with a parent: a one-page business plan with real costs and a break-even point (6.1), your survey with its tallies, percents and a graph (6.2), your four-P plan and your improved honest advertisement (6.3), and your catalog page with its guarantee (6.4). Finish with a one-page “banker’s letter” to a parent asking for a small start-up loan or investment, stating how much you need, what it is for, how and when you will repay it, and what the risks are.

LOOK FOR	WHAT IT MEANS
Completeness	All five parts are included: plan, survey, four P’s and ad, catalog page and banker’s letter.
Numbers	Costs, prices, profit per unit, break-even point and survey percents are correct and use real figures.
Honesty	Every claim in the advertisement and catalog page is true, and the risks are stated plainly.
Presentation	A neat booklet with headings, graphs and drawings, in clear, complete sentences.

ACCOUNTING

Accounting is the language of business. In Grade 5 you learned that double-entry bookkeeping records every transaction twice and that $\text{assets} = \text{liabilities} + \text{owner's equity}$. This year you will learn to keep real books the way merchants have since the Renaissance: first in a **journal**, in order of date, and then in a **ledger**, with an account for each thing the business owns, owes or earns, using **debits** and **credits**. You will meet Francesco Datini, the merchant of Prato, whose account books still survive after six hundred years.

Then you will learn to check your books with a **trial balance**, to prepare an **income statement** that shows whether a business made a profit, as Josiah Wedgwood learned to do when a hard year forced him to study his costs, and to track **cash flow**, because a business can be profitable and still run out of cash, as Henry Ford nearly did in 1921. Honest, careful books are a form of faithfulness: “He that is faithful in that which is least is faithful also in much” (Luke 16:10).

PREREQUISITES

- Knows double entry, the income statement and the balance sheet simply (Grade 5, Unit 7)
- Can add long columns of numbers accurately
- Can set up a table with labeled columns

MASTERY CHECKLIST

- ☐ I can record transactions in a journal with a debit and a credit for each, and post them to ledger accounts.
- ☐ I can state which accounts increase with debits and which increase with credits.
- ☐ I can prepare a trial balance and name errors it can and cannot catch.
- ☐ I can prepare a simple income statement with revenue, cost of goods sold, gross profit, expenses and net income.
- ☐ I can prepare a simple cash-flow summary and explain why profit is not the same as cash.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Khan Academy: Core Finance (accounting and financial statements)**: Free. Short videos on balance sheets, income statements and cash flow, written for older students. A strong sixth grader can watch the first few with a parent after Lesson 7.3.
- **LibreOffice Calc (free spreadsheet)**: Free software for keeping a journal, ledger and trial balance with formulas that add the columns for you. A parent should download and install it. Google Sheets works too.

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 The Journal and the Ledger: Debits and Credits	2 sessions of 50 minutes
7.2 The Trial Balance: Checking the Books	2 sessions of 50 minutes
7.3 The Income Statement: Wedgwood Counts His Costs	2 sessions of 50 minutes
7.4 Cash Flow: Profit Is Not Cash	2 sessions of 50 minutes

UNIT 7 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. 8 pts

What is the difference between a journal and a ledger?

2. 8 pts

Which kinds of accounts increase with a debit, and which increase with a credit?

3. **10 pts**

Write the journal entry (debit and credit) for each: (a) The owner invests \$100 cash. (b) The business buys supplies for \$25 cash. (c) The business sells goods for \$40 cash. (d) The business borrows \$50.

4. **6 pts**

After the four entries in question 3, what is the balance of the Cash account?

5. **8 pts**

A trial balance shows debits of \$1,254 and credits of \$1,227. What kind of error might you look for first, and why?

6. **8 pts**

Name two kinds of errors a trial balance cannot catch.

7. **8 pts**

What did Josiah Wedgwood learn about his costs in 1772?

8. **12 pts**

A bakery has revenue of \$8,000, cost of goods sold of \$3,200 and operating expenses of \$3,600 for a month. Find the gross profit, net income, gross margin and net margin.

9. **8 pts**

Sort these into operating, investing or financing cash flows: (a) cash from customers; (b) buying a delivery van; (c) repaying a bank loan; (d) paying wages.

10. **8 pts**

In one month a shop collects \$1,500 from customers, pays \$1,100 for supplies and wages, buys a \$600 display case and borrows \$400. What is the net change in cash?

11. **6 pts**

How did Henry Ford raise cash to repay his loans in 1921 without borrowing more?

12. **10 pts**

Short answer: Explain why a business can show a profit and still run out of cash.
Give an example.

ANSWER KEY

1. A journal records every transaction in order of date, with its debit and credit. A ledger collects the entries by account (Cash, Supplies, Loan, Sales and so on), so the balance of each account can be seen.
2. Debits increase assets and expenses. Credits increase liabilities, owner's equity and revenue.
3. (a) Debit Cash \$100, credit Owner's Equity \$100. (b) Debit Supplies \$25, credit Cash \$25. (c) Debit Cash \$40, credit Sales Revenue \$40. (d) Debit Cash \$50, credit Loan Payable \$50.
4. Debits $100 + 40 + 50 = \$190$; credit \$25; balance \$165 (debit).
5. The difference is \$27, and $27 \div 9 = 3$, so look first for a transposition error (two digits switched, such as 52 written as 25, since $52 - 25 = 27$).
6. Any two: an omitted transaction (both sides left out); an entry posted to the wrong account on the correct side; the wrong amount entered on both sides; compensating errors that cancel out.
7. Some costs rose with each piece made, but others (rent, salaries, models, showrooms) stayed the same whatever the output. When sales fell, those fixed costs made each piece much more expensive, so he needed to make more of each pattern and to price wares to cover their full cost. He also found his clerk had been cheating him.
8. Gross profit = $\$8,000 - \$3,200 = \$4,800$. Net income = $\$4,800 - \$3,600 = \$1,200$.
Gross margin = $4,800 \div 8,000 \times 100 = 60\%$. Net margin = $1,200 \div 8,000 \times 100 = 15\%$.
9. (a) Operating; (b) investing; (c) financing; (d) operating.
10. Operating $+\$1,500 - \$1,100 = +\$400$; investing $-\$600$; financing $+\$400$. Net change = $400 - 600 + 400 = +\$200$.
11. He cut prices, shut the plant and used up parts on hand instead of buying more, shipped cars to dealers who had to pay cash on arrival, sold surplus materials and equipment, cut office staff and collected money owed to the company.
12. Profit counts sales when they are made and expenses when they are used, but cash moves only when money is actually paid or received. If customers pay late, if money is tied up in large stocks, or if the business buys equipment or repays loans, cash can run out even while the income statement shows a profit.
Example: a lawn-care business earns \$400 in June but customers pay in August,

while it must pay for a new mower and a loan in June. (Accept any clear example.)

PORTFOLIO PIECE: A MONTH OF BOOKS

Keep a complete set of books for one month for a real or carefully imagined small business (your family market-day stand, a pet-sitting service or a small craft business). Include at least fifteen transactions with receipts or notes for each, a journal with equal debits and credits, ledger T-accounts with balances, a trial balance, an income statement, and a one-page cash summary showing operating, investing and financing cash flows. End with a one-page letter to the business owner (or to yourself) explaining, in plain words and with three numbers, how the month went and what should change next month.

LOOK FOR	WHAT IT MEANS
Complete records	At least fifteen transactions, each with a receipt or note, recorded in a journal and posted to the ledger.
Accuracy	Every journal entry balances, the trial balance totals agree, and the income statement and cash summary are correct.
Understanding	The letter explains clearly what the numbers mean, including the difference between profit and cash.
Neatness and honesty	Dated, labeled pages; errors corrected openly rather than erased or hidden.

7.1 THE JOURNAL AND THE LEDGER: DEBITS AND CREDITS

OBJECTIVES

- Tell how merchants like Francesco Datini kept journals and ledgers, and how Luca Pacioli described the method in 1494.
- Explain the rules of debit and credit for assets, liabilities, owner's equity, revenue and expenses.
- Record transactions in a journal with equal debits and credits.
- Post journal entries to ledger accounts (T-accounts) and find each balance.

Warm-up. Write down three money events from your last week: money you received, money you spent, something you lent or borrowed. For each one, write the two things that changed. (For example: "I bought a book: my cash went down and my books went up.")

WATCH

ACCOUNTING BASICS: Debits and Credits Explained

Accounting Stuff • 5:44

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

WHEN TO WATCH

After the story, before the big idea. Copy the debit-and-credit rules into your notebook as they are shown.

Note: Accounting Stuff is a clear, friendly accounting channel made for beginners. Stop when the teaching ends.

BACKUP VIDEO

GENERAL LEDGER: Visual Guide to Posting Journals

Accounting Stuff • 9:36

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

Before the project, to see entries posted from a journal to a ledger.

KEY TERMS

journal

The book of original entry, where every transaction is first recorded in order of date, with its debit and its credit.

debit

An entry on the left side of an account. Debits increase assets and expenses, and decrease liabilities, owner's equity and revenue.

T-account

A simple drawing of a ledger account shaped like the letter T, with debits on the left and credits on the right.

ledger

The book of accounts, with a separate page (account) for each asset, liability, owner's equity, revenue and expense; journal entries are copied, or posted, to it.

credit

An entry on the right side of an account. Credits increase liabilities, owner's equity and revenue, and decrease assets and expenses.

posting

Copying each journal entry into the right ledger accounts.

CORE IDEAS

The story. Francesco di Marco Datini was born about 1335 in Prato, a small cloth-making town near Florence, Italy. Orphaned by the plague as a boy, he went to Avignon in France as a teenager, became a merchant, and grew rich trading cloth, armor, spices and art. He later built a network of companies in Prato, Florence, Pisa, Genoa, Barcelona, Valencia and Majorca. He was famously careful with his records, and when he died in 1410 he left his fortune to a charity for the poor of Prato and his papers to the town. More than a hundred thousand of his letters and hundreds of his account books still survive. Many of his ledgers begin with the words “In the name of God and of profit,” a reminder that a merchant's accounts were kept before God.

How they figured it out. Merchants with many partners, agents and branches needed to know, at any moment, who owed them, whom they owed and whether they were making money. Over the 1300s, Italian merchants developed a system: first write each transaction in a daybook or **journal**, in order of date; then copy it, or **post** it, into a **ledger** with a separate account for each person, good or kind of income. Each transaction is entered twice, once on the left side of one account and

once on the right side of another. In 1494, in Venice, the friar and mathematician Luca Pacioli described the whole method clearly in his *Summa de arithmetica*, and printed books spread it across Europe.

The big idea. Every transaction has two sides, and the accounting equation, *assets = liabilities + owner's equity*, must always balance. The left side of every account is the **debit** side and the right side is the **credit** side. The rules: *assets and expenses increase with debits; liabilities, owner's equity and revenue increase with credits*. In every journal entry, total debits equal total credits. Example for a small card business: (1) You put in \$50 of your own money: debit Cash \$50, credit Owner's Equity \$50. (2) You buy paper for \$12 cash: debit Supplies \$12, credit Cash \$12. (3) You sell cards for \$30 cash: debit Cash \$30, credit Sales Revenue \$30. (4) You borrow \$20 from a parent: debit Cash \$20, credit Loan Payable \$20. Post these to **T-accounts**, and the Cash account shows debits of $50 + 30 + 20 = \$100$ and a credit of \$12, for a balance of \$88.

Think it through. Why go to the trouble of entering everything twice? Because the two sides check each other. If debits do not equal credits, you know a mistake has crept in. And because each account collects all its entries, you can see at a glance how much cash you have, how much you owe and how much you have earned. This is why the system has lasted more than six hundred years.

In business today. Every business, from a corner bakery to the largest company, uses double entry, usually kept by accounting software that makes the debits and credits behind the scenes. A bookkeeper who understands debits and credits can find and fix errors the software cannot. Keeping true books, every entry honest, is part of being "faithful in that which is least" (Luke 16:10).

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 family of merchants in Cologne who traded with the German merchants of London's Steelyard, the Hanseatic trading station where Holbein painted several merchants' portraits. A small book lies on the table with a slip of paper tucked in it, and gold Latin letters on the background give the year, 1532, and his age, 29.

Look closely

- Find the book under his hand. What kind of book might a merchant keep close?
- Find the slip of paper. What might be written on it?
- Look at his clothes. Are they showy or sober? What does that say about how he wanted to be seen?
- Find the gold letters on the blue background. What do they tell you?

Talk about it

1. Why would a merchant choose to be painted with a book rather than with gold or goods?
2. If this book were his ledger, what accounts might be in it?

3. What qualities would you trust in a merchant who kept careful books?

PROJECT

Start the Books: A Journal and Ledger for Ten Transactions

You will record ten transactions of a small business in a journal, post them to T-accounts in a ledger, and find each account's balance, just as merchants have done since Datini's day.

You will need

- Ledger notebook or graph paper, a ruler and a pencil
- A calculator
- Optional: a free spreadsheet

Steps

1. Set up a journal page with columns: Date, Account, Debit, Credit, Explanation.
2. Record these transactions for “Card Shop” (practice numbers). 1: Owner invests \$60 cash. 2: Buys card stock for \$15 cash. 3: Buys envelopes for \$6 cash. 4: Borrows \$25 from a parent (loan). 5: Sells cards for \$18 cash. 6: Buys a paper cutter for \$20 cash (an asset called Equipment). 7: Sells cards for \$24 cash. 8: Pays \$4 for a booth fee (an expense). 9: Repays \$10 of the loan. 10: Sells cards for \$15 cash.
3. For each, decide which two accounts change, which is debited and which credited, and check that the debit equals the credit.
4. Draw a T-account for each account used: Cash, Supplies, Equipment, Loan Payable, Owner's Equity, Sales Revenue, Booth Fee Expense.
5. Post each journal entry: write its amount on the debit side of one account and the credit side of the other, with the transaction number.
6. Find each account's balance (total debits minus total credits, or the reverse).
7. Check: does assets (Cash + Supplies + Equipment) equal liabilities (Loan) + owner's equity + (revenue – expenses)? Write the equation with your numbers.

Tips

- Cash: debits $60 + 25 + 18 + 24 + 15 = 142$; credits $15 + 6 + 20 + 4 + 10 = 55$; balance \$87. Check your work against this.
- Every journal entry must have equal debits and credits. If they are not equal, stop and find the mistake before posting.

Check your work

- ☐ I can state the rules of debit and credit for the five kinds of accounts.
- ☐ My journal has a balanced debit and credit for each transaction.
- ☐ I posted every entry to T-accounts and found correct balances.

LEDGER NOTEBOOK

1. Make a rules chart: five rows (Assets, Expenses, Liabilities, Owner's Equity, Revenue) and two columns (Increase with, Decrease with). Fill in debit or credit.
2. Draw the four T-accounts from the lesson's example and post the four entries.
3. Make a timeline: about 1335 Datini born; 1300s Italian merchants develop double entry; 1410 Datini dies; 1494 Pacioli's *Summa*.
4. Write one sentence explaining why debits must always equal credits.

From history. Datini's house in Prato still stands and holds the Datini archive, one of the richest collections of medieval business records in the world. Historians use his letters and account books to learn the prices of goods, the routes of ships and even what merchants ate and how they wrote to their wives.

COMMON MISTAKES

- Thinking debit means "bad" or "minus." Debit simply means the left side; it increases some accounts and decreases others.
- Recording only one side of a transaction. Every transaction changes at least two accounts.
- Treating an owner's investment as revenue. Money the owner puts in is owner's equity, not sales.

Make it a game • Left Hand, Right Hand. Your parent calls a transaction, such as bought supplies with cash or earned sales. Say which accounts change, and raise your left hand for a debit and your right hand for a credit. Write the journal entry and post it in T-accounts. Reach ten correct entries without a miss. Tell how Datini and Pacioli recorded.

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)

A bookkeeper who records every small entry honestly can be trusted with large accounts. Faithfulness in small numbers is training for faithfulness in great things.

7.2 THE TRIAL BALANCE: CHECKING THE BOOKS

OBJECTIVES

- Prepare a trial balance from ledger accounts.
- Explain why total debits must equal total credits and what it means when they do not.
- Name errors a trial balance can catch and errors it cannot catch.
- Find and correct planted errors in a set of books.

Warm-up. A friend tells you the class has collected \$86 for a gift, but the envelope holds \$68. List three different mistakes that could explain the difference. Which mistake would you look for first? (Hint: subtract 68 from 86 and divide by 9.)

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, before the project.

BACKUP VIDEO

Trial balance explained

The Finance Storyteller • 5:37

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

After the project, for a second explanation with another example.

KEY TERMS

trial balance

A list of every ledger account with its debit or credit balance, totaled to check that total debits equal total credits.

transposition error

A mistake in which two digits are switched, such as writing 68 for 86. The difference is always divisible by 9.

error of omission

Leaving a whole transaction out of the books. A trial balance cannot catch it, because both sides are missing.

compensating errors

Two mistakes of the same size on opposite sides that cancel each other out, hiding both from the trial balance.

audit

A careful check of a business's books and records by someone independent, to make sure they are complete and true.

CORE IDEAS

The story. Luca Pacioli's 1494 book on bookkeeping did more than describe the journal and the ledger. It also told merchants how to check their work: at the end of a period, list the balance of every account, add the debits and the credits, and see whether the two totals agree. If they did not, Pacioli wrote, there was a mistake in the ledger to be found. Three centuries later, in 1796, a Bristol bookkeeper named Edward Thomas Jones published a new "English System" of bookkeeping, which he advertised as simpler than double entry and better at preventing errors. Thousands of merchants bought it. But other accountants soon pointed out its weaknesses, and it never replaced the old Italian method, whose built-in check had proved its worth.

How they figured it out. The check is called a **trial balance**. Because every transaction is recorded with equal debits and credits, the total of all debit balances in the ledger must equal the total of all credit balances. You list each account with its balance in the debit or credit column and add both columns. If the totals match, the books are probably in order. If they do not, look for common mistakes: a number posted to the wrong side, a posting forgotten, or a **transposition error**, where digits are switched. A handy trick: if the difference between the totals divides evenly by 9, look for a transposition ($86 - 68 = 18$, and $18 \div 9 = 2$).

The big idea. A trial balance that balances is a good sign, but it is not proof that the books are right. It cannot catch an **error of omission** (a sale never recorded at all), a transaction posted to the wrong account on the correct side (equipment recorded as supplies), the wrong amount entered on both sides, or **compensating errors** that cancel out. That is why careful businesses also keep receipts for every entry and

have their books checked by an independent **audit**. Accounting is not only arithmetic; it is honesty, checked by others.

Think it through. Pacioli and the merchants who used his method took satisfaction in balanced books, because a balance meant care and truth. Scripture links a just balance with God himself: “A just weight and balance are the LORD’s” (Proverbs 16:11). A bookkeeper who hides a difference instead of finding it, or “plugs” a number to make the totals match, has turned a tool for honesty into a tool for deceit.

In business today. Accounting software prepares trial balances automatically, but accountants still review them every month, investigate any account that looks unusual, and compare the books with bank statements and inventory counts. Auditors check the trial balance against the evidence: invoices, receipts, contracts and the actual goods on the shelves.

PICTURE STUDY



A Goldsmith in His Shop, Petrus Christus, 1449 · Oil on oak panel · Metropolitan Museum of Art, New York

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

Petrus Christus worked in Bruges, a great trading city in what is now Belgium. Here a goldsmith weighs a ring for a young couple who may be about to marry. On the counter are coins, a set of weights and a balance, and on the shelves are samples of his work and raw materials.

Look closely

- Find the balance and the weights. What is the goldsmith checking?
- Find the coins on the counter. What might they be for?
- Find the round mirror. What does it show outside the shop?
- Look at the shelves. Which items are finished goods and which are materials?

Talk about it

1. Why would the couple want to watch the goldsmith weigh the ring?
2. How is weighing on a balance like checking a trial balance?
3. What would make you trust this goldsmith?

PROJECT

The Error Hunt

You will prepare a trial balance from your Card Shop ledger, then hunt for errors a parent has planted in a second set of books, using the tricks of a real bookkeeper.

You will need

- Your Card Shop ledger from Lesson 7.1
- A second copy of the journal and ledger in which a parent has planted three errors
- Ledger notebook, a red pencil and a calculator

Steps

1. List every account in your Card Shop ledger with its balance in a Debit column or a Credit column. Assets and expenses usually have debit balances; liabilities, owner's equity and revenue usually have credit balances.
2. Add each column. Do the totals match? If not, find and fix the mistake before going on.
3. **For the parent:** on a fresh copy of the books, plant three errors: one transposition (for example, 24 written as 42 on one side only), one posting on the wrong side, and one omitted transaction (both sides left out).
4. Prepare a trial balance from the planted books. Record the difference between the totals.
5. Use the tricks: Is the difference divisible by 9 (transposition)? Is it twice an entry (wrong side)? Is it equal to an entry (one side missing)?
6. Mark each error you find in red and write the correction.
7. Which error did the trial balance not reveal? How could you have found it (receipts, counting the cash, checking the journal against sales records)?
8. Write a paragraph: Why is a balanced trial balance a good sign but not a proof?

Tips

- A posting on the wrong side makes the difference twice the amount of the entry.
- Always compare your Cash account balance with the actual cash in the box. That is the simplest audit.

Check your work

- ☐ I prepared a trial balance with equal debit and credit totals.
- ☐ I found errors using the divisible-by-9 and twice-the-amount tricks.
- ☐ I can name at least two errors a trial balance cannot catch.

LEDGER NOTEBOOK

1. Copy your Card Shop trial balance neatly with headings, columns and totals, and the date.
2. Make a chart: Errors a trial balance catches, Errors it does not catch, with two examples each.
3. Try three transposition pairs (52/25, 81/18, 73/37). Subtract each and divide by 9. What do you notice?
4. What I would change: one sentence about how you would keep from making the errors you found.

From history. Pacioli's chapters on bookkeeping were translated into Dutch, English, French and German during the 1500s, and many later bookkeeping books copied his instructions, sometimes word for word. For centuries, apprentices in counting houses learned to "balance the books" before they were trusted with a merchant's money.

COMMON MISTAKES

- Thinking a balanced trial balance proves the books are right. Omissions and wrong-account errors can hide.
- Putting an account's balance in the wrong column. Check the rules of debit and credit.
- Forcing the totals to match with a made-up number. Find the real mistake instead.

Make it a game • Plant and Hunt. Each of you writes a list of ten ledger balances with a total, secretly planting one error, such as swapping 54 for 45. Trade papers and hunt for the mistake with a trial balance. Whoever finds it first wins. Say what a difference divisible by nine hints, and what compensating errors are.

Scripture. “A just weight and balance are the LORD’s: all the weights of the bag are his work.” (Proverbs 16:11, KJV)

A merchant’s balance and a bookkeeper’s balance both belong to God. Checking them honestly, and fixing every error, is part of dealing justly.

7.3 THE INCOME STATEMENT: WEDGWOOD COUNTS HIS COSTS

OBJECTIVES

- Tell how Josiah Wedgwood studied his costs during the hard year of 1772.
- Tell the difference between cost of goods sold and operating expenses, and between fixed and variable costs.
- Prepare an income statement with revenue, cost of goods sold, gross profit, operating expenses and net income.
- Calculate gross margin and net margin as percents.

Warm-up. A lemonade stand sells \$40 of lemonade. The lemons, sugar and cups cost \$12. The table and sign, bought earlier, cost \$10. Did the stand make a profit? How much? Is there more than one way to answer? Write your answers.

WATCH

INCOME STATEMENT: Explained in (Almost) 2 Minutes!

Accounting Stuff • 7:21

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

WHEN TO WATCH

After the story, before the big idea. Copy the layout of the income statement as it is shown.

KEY TERMS

income statement

A report of a business's revenue, expenses and profit or loss over a period of time, such as a month or a year.

gross profit

Revenue minus cost of goods sold.

cost of goods sold

The direct cost of making or buying the goods that were sold: materials and the labor that went straight into them.

operating expenses

The other costs of running the business, such as rent, salaries of managers, advertising and utilities.

net income

The bottom line: gross profit minus operating expenses (and interest). If it is negative, it is a net loss.

margin

Profit as a percent of revenue. Gross margin = gross profit ÷ revenue × 100; net margin = net income ÷ revenue × 100.

CORE IDEAS

The story. In 1772 a banking panic that began in London and Scotland spread across Britain. Credit dried up, customers stopped buying, and Josiah Wedgwood's warehouses filled with unsold pottery. Wedgwood had been so busy inventing new wares, building his Etruria factory and opening showrooms that he did not really know which of his products made money. Now he had to find out. He sat down with his accounts and worked out, piece by piece, what each kind of ware cost to make: the clay, the glaze, the labor at each step, the fuel for the kilns.

How they figured it out. Wedgwood made an important discovery. Some costs, like clay and the workers' piece-wages, rose with each piece made. But others, like rent, the salaries of clerks and managers, the costs of models and moulds, and the showrooms, stayed almost the same whether the factory made many pieces or few. When sales fell, those fixed costs were spread over fewer pieces, and each piece cost much more. He wrote to his partner Thomas Bentley that the secret was to make more pieces of each pattern, so the fixed costs were spread thinly. He also found that some wares had been priced too low to cover their true cost, and he changed his prices. And as he examined his accounts more closely, he discovered that his chief clerk had been cheating him, a painful lesson in why books must be checked.

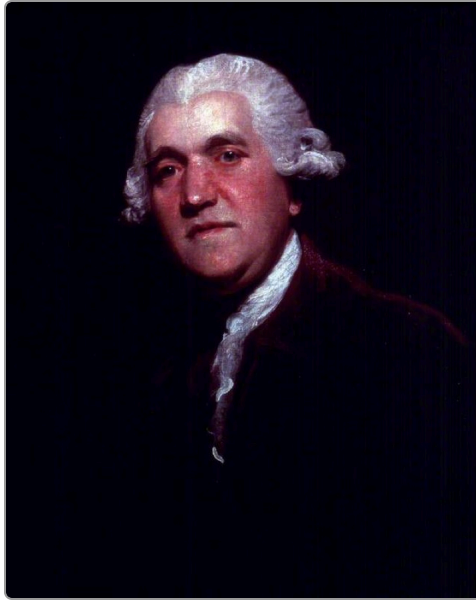
The big idea. An **income statement** shows whether a business made a profit over a period. Its layout: *Revenue – cost of goods sold = gross profit; gross profit – operating expenses = net income*. Example, a small pottery for one month: revenue \$5,000; **cost of goods sold** (clay, glaze, kiln fuel, potters' wages) \$2,000; **gross profit** \$3,000.

Operating expenses: rent \$800, a manager's salary \$1,200, advertising \$300, total \$2,300. **Net income** = \$3,000 – \$2,300 = \$700. **Gross margin** = $3,000 \div 5,000 \times 100 = 60\%$; **net margin** = $700 \div 5,000 \times 100 = 14\%$. If sales fall to \$4,000 with the same 60% gross margin, gross profit is \$2,400, and net income is only \$100, because the operating expenses stay the same. That is exactly what Wedgwood discovered.

Think it through. The income statement is a kind of report of stewardship. In Jesus' parable, the master says to his steward, "give an account of thy stewardship" (Luke 16:2). An owner, a manager or a bookkeeper should always be ready to show truthfully what came in, what went out, and what was gained or lost.

In business today. Every business prepares income statements, usually every month and every year. Owners use them to set prices, cut waste and decide what to make more of; banks read them before lending; and companies that sell shares to the public must publish them. A small business owner who reads his income statement every month will see trouble coming long before it arrives.

PICTURE STUDY



Josiah Wedgwood, Sir Joshua Reynolds, 1782 · Oil on canvas · Wedgwood Collection, Barlaston, Staffordshire

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

Sir Joshua Reynolds was the leading portrait painter in England and the first president of the Royal Academy of Arts. He painted Josiah Wedgwood in 1782, when the potter was fifty-one and one of the most successful manufacturers in Britain, ten years after the hard year that taught him to count his costs.

Look closely

- Look at his face. Does he seem worried, confident, thoughtful?
- Look at his clothes. Compare them with those of the merchants and noblemen you have seen this year.
- Look at the background and light. What does the painter want you to look at?

Talk about it

1. What does a portrait by the most famous painter in England tell you about how far Wedgwood had come since he started as a village potter?
2. How might knowing his costs have helped Wedgwood become so successful?
3. Wedgwood was painted by both George Stubbs (Grade 5) and Joshua Reynolds. How might a painter's choices show a different side of the same man?

PROJECT

Income Statement for the Card Shop and the Pottery

You will prepare a full income statement for your Card Shop from Lessons 7.1–7.2, then test what happens to a business’s profit when sales rise and fall, as Wedgwood did in 1772.

You will need

- Your Card Shop ledger and trial balance
- Ledger notebook or a free spreadsheet
- A calculator

Steps

1. From your Card Shop ledger, list revenue (sales) and expenses. Treat the card stock and envelopes used as cost of goods sold (assume all were used) and the booth fee as an operating expense.
2. Prepare the income statement with a heading (business name, “Income Statement,” the period): Revenue; Cost of goods sold; Gross profit; Operating expenses; Net income.
3. Calculate the gross margin and net margin as percents.
4. **Wedgwood’s test.** Use the pottery example from the lesson (revenue \$5,000; cost of goods sold 40% of revenue; operating expenses \$2,300 a month, fixed). Make a table for monthly sales of \$3,000, \$4,000, \$5,000, \$6,000 and \$8,000: Revenue, Cost of goods sold, Gross profit, Operating expenses, Net income.
5. At what level of sales does the pottery break even (net income \$0)? Hint: gross profit must equal \$2,300, and gross profit is 60% of revenue.
6. Draw a line graph of net income against revenue.
7. Write a paragraph: Why does net income change much faster than revenue? What would you advise Wedgwood to do in a slow month?

Tips

- Break-even revenue = fixed costs ÷ gross margin as a decimal: $\$2,300 \div 0.60 \approx \$3,833$.

- Keep the income statement's order: revenue first, then subtract down to the bottom line.

Check your work

- ☐ I prepared an income statement in the correct order with a proper heading.
- ☐ I calculated gross margin and net margin.
- ☐ I can explain why fixed costs make profit rise and fall faster than sales.

LEDGER NOTEBOOK

1. Copy the income-statement layout in a box: Revenue – COGS = Gross profit – Operating expenses = Net income.
2. Copy your table from Wedgwood's test and circle the break-even month.
3. Sort these costs of a bakery into cost of goods sold or operating expenses: flour, the baker's hourly wage, rent, butter, advertising, the electric bill, boxes for cakes.
4. Write a short letter from Wedgwood to Bentley in 1772 explaining, with one number, what he learned about his costs.

From history. Wedgwood's careful study of his costs in 1772 is one of the earliest known examples of what is now called cost accounting. Historians have found his notes and letters, in which he worked out the costs of individual wares and the effect of making more or fewer of each, many years before such methods were taught in any school.

COMMON MISTAKES

- Mixing up revenue and profit. Revenue is all the money from sales; profit is what is left after costs.
- Treating the purchase of equipment as an expense in the month it is bought. Equipment is an asset that is used up over years.
- Forgetting fixed costs. They do not go away when sales fall.

Make it a game • Sort the Costs. Write ten costs on cards: clay, wages for the potter, rent, advertising, glaze, a clerk's pay, and so on. Sort them into cost of goods sold or operating expenses, then fixed or variable. Your parent may challenge any card. Build a mini income statement and name gross profit and net income, as Wedgwood did in 1772.

Scripture. “And he called him, and said unto him, How is it that I hear this of thee? give an account of thy stewardship; for thou mayest be no longer steward.” (Luke 16:2, KJV)

Every steward must one day give an account. An honest income statement is a business’s account of its stewardship, ready for the owner, the banker and, above all, God.

7.4 CASH FLOW: PROFIT IS NOT CASH

OBJECTIVES

- Explain why a profitable business can still run out of cash.
- Tell how Henry Ford raised the cash to pay his debts in the hard winter of 1920–1921.
- Sort cash flows into operating, investing and financing activities.
- Prepare a month-by-month cash budget and find when cash runs short.

Warm-up. You mow lawns. In June you earn \$200, but your neighbors say they will pay you in August. Meanwhile, you must buy gas for the mower (\$30) and repay \$50 you borrowed. Did you make money in June? Can you pay your bills in June? Write both answers.

WATCH

The CASH FLOW STATEMENT for BEGINNERS

Accounting Stuff • 15:10

<https://www.youtube.com/watch?v=DiVPAjgmnj0>

WHEN TO WATCH

After the big idea. Watch the first eight minutes, where the three kinds of cash flow are explained; the rest goes into more detail for older students.

BACKUP VIDEO

Cash Flow Statement Explained for Beginners!

Accounting Basics • 3:34

<https://www.youtube.com/watch?v=5lgjnd9d8AY>

If the main video is too long, watch this shorter overview instead.

KEY TERMS

cash flow

The money actually coming into and going out of a business over a period of time.

accounts receivable

Money customers owe a business for goods or services already delivered.

operating, investing and financing activities

The three kinds of cash flow: operating (selling goods and paying everyday costs), investing (buying or selling equipment and buildings) and financing (borrowing, repaying, and owners putting in or taking out money).

liquidity

A business's ability to pay its bills when they come due.

cash budget

A plan showing expected cash coming in and going out, month by month, so that shortages can be seen ahead of time.

CORE IDEAS

The story. In 1919 Henry Ford bought out all the other shareholders of the Ford Motor Company so that he and his family would own it completely. To do it, he borrowed tens of millions of dollars from banks, to be repaid in 1921. Then, in 1920, a sharp slump hit the American economy. Prices fell, people stopped buying cars, and Ford's sales dropped. The Ford Motor Company was a highly profitable business, with great factories and a famous product, but it was running short of the one thing needed to repay the banks: cash. Wall Street bankers expected Ford to come asking for new loans, and perhaps to give up some control of his company to get them.

How they figured it out. Ford refused to borrow more. Instead, he squeezed cash out of his own business. He cut the price of the Model T to keep cars moving. He shut the plant for several weeks at the end of 1920 and used up the parts and materials already on hand instead of buying more. Then he restarted production and shipped finished cars to his dealers, who had to pay for them in cash when they arrived. Many dealers had to borrow from their own local banks to do so. Ford also sold off surplus materials and equipment, cut office staff and collected money owed to the company. By the spring of 1921, Ford had enough cash to repay his debts without new loans from Wall Street. The plan worked for Ford, though it put heavy pressure on his dealers and on the workers who were laid off for a time.

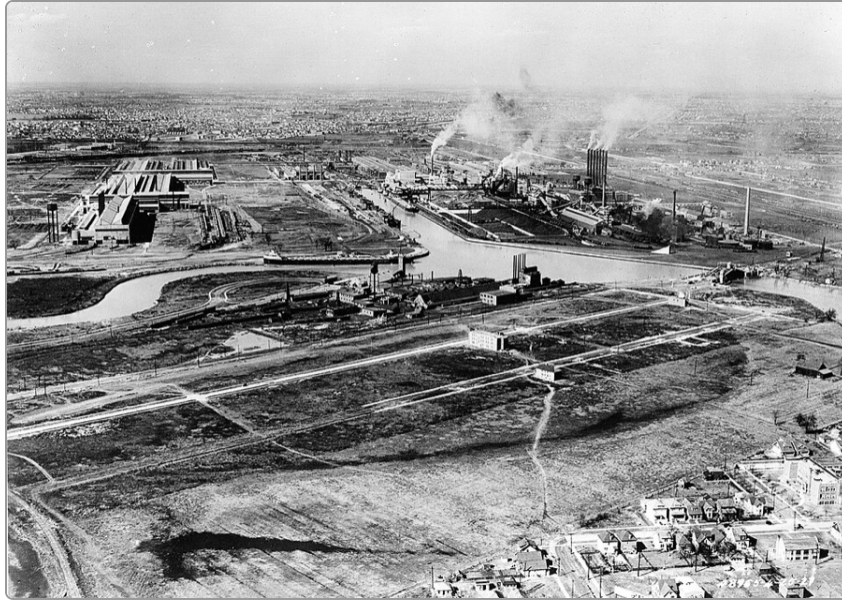
The big idea. Profit and cash are not the same. The income statement records a sale when it is made, even if the customer pays later; the cash arrives only when the

customer pays. Cash also goes out for things that are not expenses, like buying equipment or repaying a loan. There are three kinds of **cash flow**: **operating** (cash from customers, minus cash paid for supplies, wages and rent), **investing** (cash spent on or received from equipment and buildings) and **financing** (cash borrowed or repaid, and cash the owners put in or take out). Example for one month: cash from customers \$900, cash paid for supplies and wages \$650, so operating cash flow = +\$250. Bought a new oven: -\$400 (investing). Borrowed \$300: +\$300 (financing). Net change in cash = $250 - 400 + 300 = +\$150$. A business that sells on credit, holds too much stock, or buys equipment too fast can run out of cash even while it shows a profit.

Think it through. The ant in Proverbs “provideth her meat in the summer, and gathereth her food in the harvest” (Proverbs 6:8). A wise business, like a wise family, looks ahead at when money will come in and when bills will come due, and keeps a cash reserve for lean months. Ford’s crisis came because the timing of his debts and his cash did not match.

In business today. Many small businesses that fail are profitable on paper but run out of cash. Owners use a **cash budget** to plan ahead, collect money owed promptly, keep only the stock they need (like Toyota’s just-in-time, Lesson 4.4) and keep a reserve. Large companies publish a statement of cash flows each year alongside their income statement and balance sheet.

PICTURE STUDY



The Ford River Rouge Plant from the Air, Unknown photographer, 1920s–1930s · Photograph · Library of Congress, Washington, D.C.

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

Henry Ford began building the River Rouge plant near Detroit in 1917. It became one of the largest factories in the world, where iron ore and coal arrived by ship and rail at one end and finished cars left at the other. A plant this size took enormous amounts of cash to build and run.

Look closely

- Find the river, the docks and the railroad tracks. What came in and what went out?
- Count the smokestacks. What do they tell you about the factory's work?
- Look for places where raw materials or finished goods are stored.

Talk about it

1. Is building a plant like this an operating, investing or financing activity?
2. Why might a company with a plant this large still run short of cash?
3. If the plant had piles of unused parts and materials, how could Ford turn them into cash?

PROJECT

A Six-Month Cash Budget

You will build a six-month cash budget for a small business, find the month when cash runs short, and fix the problem the way Ford did: by changing the timing of money in and money out.

You will need

- Ledger notebook or a free spreadsheet
- A calculator

Steps

1. Use this practice business, a lawn-care service. Starting cash: \$100. Sales each month (April–September): \$150, \$300, \$400, \$400, \$300, \$150. Customers pay half in the month of the job and half the next month.
2. Cash out: gas and supplies \$40 a month; a new trimmer for \$180 in May (investing); repay a \$120 loan in June (financing).
3. Make a table with a column for each month: Starting cash, Cash from customers, Cash paid for supplies, Equipment, Loan repayment, Ending cash.
4. Fill in each month. The ending cash of one month is the starting cash of the next.
5. Find any month when ending cash is below zero. That is a cash shortage, even though the business is profitable.
6. Fix it in two different ways, as Ford did, without new borrowing: for example, ask customers to pay in full when the job is done, or buy the trimmer in July instead of May. Show the new budget for each fix.
7. Sort every cash flow in your table into operating, investing or financing.
8. Write a paragraph: Why is a business's cash as important as its profit? What did Ford's 1921 plan cost his dealers and workers?

Tips

- April cash from customers = half of April's sales (\$75). May = half of April (\$75) + half of May (\$150) = \$225.

- Write negative cash in red or in parentheses, as accountants do.

Check your work

- ☐ I can explain why profit is not the same as cash.
- ☐ I built a six-month cash budget and found a shortage.
- ☐ I sorted cash flows into operating, investing and financing activities.

LEDGER NOTEBOOK

1. Draw three pipes flowing into and out of a cash tank, labeled Operating, Investing and Financing, with two examples on each pipe.
2. Copy the lesson's one-month example and check the net change in cash.
3. Make a timeline: 1917 River Rouge begun; 1919 Ford buys out shareholders with borrowed money; 1920 slump; December 1920 plant shut; early 1921 cars shipped for cash; spring 1921 debts repaid.
4. Write three things a family can do to avoid a cash shortage, using the ant of Proverbs 6.

From history. Henry Ford never forgot the winter of 1920–1921. For the rest of his life he kept enormous amounts of cash in the company, refusing to depend on bankers. Some business historians think this caution helped Ford survive hard times, while others think it made the company slow to invest in new models.

COMMON MISTAKES

- Thinking a profitable business always has cash. Sales on credit, large stocks and equipment purchases all tie up cash.
- Counting a loan as income. Borrowed money is cash coming in, but it is a liability that must be repaid, not revenue.
- Forgetting that the ending cash of one month is the starting cash of the next.

Make it a game • Profit Without Cash. Run a pretend six-month shop with beans as cash. Each month you sell, but customers pay two months later, while rent and supplies are due now. Track the cash bowl. Does a profitable shop run out of cash? Make a cash budget fix. Tell how Henry Ford raised cash in the winter of 1920.

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 does not wait until winter to think about food. A wise business plans its cash ahead, gathering in good months for the lean months to come.

ACCOUNTING

Accounting is the language of business. In Grade 5 you learned that double-entry bookkeeping records every transaction twice and that $\text{assets} = \text{liabilities} + \text{owner's equity}$. This year you will learn to keep real books the way merchants have since the Renaissance: first in a **journal**, in order of date, and then in a **ledger**, with an account for each thing the business owns, owes or earns, using **debits** and **credits**. You will meet Francesco Datini, the merchant of Prato, whose account books still survive after six hundred years.

Then you will learn to check your books with a **trial balance**, to prepare an **income statement** that shows whether a business made a profit, as Josiah Wedgwood learned to do when a hard year forced him to study his costs, and to track **cash flow**, because a business can be profitable and still run out of cash, as Henry Ford nearly did in 1921. Honest, careful books are a form of faithfulness: “He that is faithful in that which is least is faithful also in much” (Luke 16:10).

PREREQUISITES

- Knows double entry, the income statement and the balance sheet simply (Grade 5, Unit 7)
- Can add long columns of numbers accurately
- Can set up a table with labeled columns

MASTERY CHECKLIST

- ☐ I can record transactions in a journal with a debit and a credit for each, and post them to ledger accounts.
- ☐ I can state which accounts increase with debits and which increase with credits.
- ☐ I can prepare a trial balance and name errors it can and cannot catch.
- ☐ I can prepare a simple income statement with revenue, cost of goods sold, gross profit, expenses and net income.
- ☐ I can prepare a simple cash-flow summary and explain why profit is not the same as cash.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Khan Academy: Core Finance (accounting and financial statements)**: Free. Short videos on balance sheets, income statements and cash flow, written for older students. A strong sixth grader can watch the first few with a parent after Lesson 7.3.
- **LibreOffice Calc (free spreadsheet)**: Free software for keeping a journal, ledger and trial balance with formulas that add the columns for you. A parent should download and install it. Google Sheets works too.

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	The Journal and the Ledger: Debits and Credits	2 sessions of 50 minutes
7.2	The Trial Balance: Checking the Books	2 sessions of 50 minutes
7.3	The Income Statement: Wedgwood Counts His Costs	2 sessions of 50 minutes
7.4	Cash Flow: Profit Is Not Cash	2 sessions of 50 minutes

UNIT 7 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. 8 pts

What is the difference between a journal and a ledger?

2. 8 pts

Which kinds of accounts increase with a debit, and which increase with a credit?

3. **10 pts**

Write the journal entry (debit and credit) for each: (a) The owner invests \$100 cash. (b) The business buys supplies for \$25 cash. (c) The business sells goods for \$40 cash. (d) The business borrows \$50.

4. **6 pts**

After the four entries in question 3, what is the balance of the Cash account?

5. **8 pts**

A trial balance shows debits of \$1,254 and credits of \$1,227. What kind of error might you look for first, and why?

6. **8 pts**

Name two kinds of errors a trial balance cannot catch.

7. **8 pts**

What did Josiah Wedgwood learn about his costs in 1772?

8. **12 pts**

A bakery has revenue of \$8,000, cost of goods sold of \$3,200 and operating expenses of \$3,600 for a month. Find the gross profit, net income, gross margin and net margin.

9. **8 pts**

Sort these into operating, investing or financing cash flows: (a) cash from customers; (b) buying a delivery van; (c) repaying a bank loan; (d) paying wages.

10. **8 pts**

In one month a shop collects \$1,500 from customers, pays \$1,100 for supplies and wages, buys a \$600 display case and borrows \$400. What is the net change in cash?

11. **6 pts**

How did Henry Ford raise cash to repay his loans in 1921 without borrowing more?

12. **10 pts**

Short answer: Explain why a business can show a profit and still run out of cash.
Give an example.

ANSWER KEY

1. A journal records every transaction in order of date, with its debit and credit. A ledger collects the entries by account (Cash, Supplies, Loan, Sales and so on), so the balance of each account can be seen.
2. Debits increase assets and expenses. Credits increase liabilities, owner's equity and revenue.
3. (a) Debit Cash \$100, credit Owner's Equity \$100. (b) Debit Supplies \$25, credit Cash \$25. (c) Debit Cash \$40, credit Sales Revenue \$40. (d) Debit Cash \$50, credit Loan Payable \$50.
4. Debits $100 + 40 + 50 = \$190$; credit \$25; balance \$165 (debit).
5. The difference is \$27, and $27 \div 9 = 3$, so look first for a transposition error (two digits switched, such as 52 written as 25, since $52 - 25 = 27$).
6. Any two: an omitted transaction (both sides left out); an entry posted to the wrong account on the correct side; the wrong amount entered on both sides; compensating errors that cancel out.
7. Some costs rose with each piece made, but others (rent, salaries, models, showrooms) stayed the same whatever the output. When sales fell, those fixed costs made each piece much more expensive, so he needed to make more of each pattern and to price wares to cover their full cost. He also found his clerk had been cheating him.
8. Gross profit = $\$8,000 - \$3,200 = \$4,800$. Net income = $\$4,800 - \$3,600 = \$1,200$.
Gross margin = $4,800 \div 8,000 \times 100 = 60\%$. Net margin = $1,200 \div 8,000 \times 100 = 15\%$.
9. (a) Operating; (b) investing; (c) financing; (d) operating.
10. Operating $+\$1,500 - \$1,100 = +\$400$; investing $-\$600$; financing $+\$400$. Net change = $400 - 600 + 400 = +\$200$.
11. He cut prices, shut the plant and used up parts on hand instead of buying more, shipped cars to dealers who had to pay cash on arrival, sold surplus materials and equipment, cut office staff and collected money owed to the company.
12. Profit counts sales when they are made and expenses when they are used, but cash moves only when money is actually paid or received. If customers pay late, if money is tied up in large stocks, or if the business buys equipment or repays loans, cash can run out even while the income statement shows a profit.
Example: a lawn-care business earns \$400 in June but customers pay in August,

while it must pay for a new mower and a loan in June. (Accept any clear example.)

PORTFOLIO PIECE: A MONTH OF BOOKS

Keep a complete set of books for one month for a real or carefully imagined small business (your family market-day stand, a pet-sitting service or a small craft business). Include at least fifteen transactions with receipts or notes for each, a journal with equal debits and credits, ledger T-accounts with balances, a trial balance, an income statement, and a one-page cash summary showing operating, investing and financing cash flows. End with a one-page letter to the business owner (or to yourself) explaining, in plain words and with three numbers, how the month went and what should change next month.

LOOK FOR	WHAT IT MEANS
Complete records	At least fifteen transactions, each with a receipt or note, recorded in a journal and posted to the ledger.
Accuracy	Every journal entry balances, the trial balance totals agree, and the income statement and cash summary are correct.
Understanding	The letter explains clearly what the numbers mean, including the difference between profit and cash.
Neatness and honesty	Dated, labeled pages; errors corrected openly rather than erased or hidden.

UNIT 8

SAVING, INVESTING AND GIVING

Money that is saved and wisely invested can grow, because it earns interest and the interest earns interest. In this unit you will learn the **compound-interest formula**, $A = P(1 + r)^n$, and use it with real numbers, starting from the story of Henry Duncan, a Scottish minister who opened a savings bank for the poor families of his parish in 1810. Then you will learn how **stocks** let people own a share of a business, from the brokers of the New York Stock Exchange to the first stock index, and how **bonds** let people lend to governments and companies, as Alexander Hamilton's plan for the new nation's debts showed.

Last, you will study **credit and debt**: how credit cards work, what interest on a balance really costs, and why Scripture warns that “the borrower is servant to the lender” (Proverbs 22:7). You will finish the year with a **family market day**, showing your best work and something you have made, and deciding how much of what you earn you will save, spend and give. John Wesley put it simply in 1760: gain all you can, save all you can, give all you can. All investing in this course is practice with pretend money.

PREREQUISITES

- Knows simple interest, compound growth, stocks and bonds simply (Grade 5, Unit 8)
- Can use a calculator to multiply repeatedly or use a power key
- Can calculate percents and percent change

MASTERY CHECKLIST

- ☐ I can use $A = P(1 + r)^n$ to calculate compound interest and the rule of 72 to estimate doubling time.
- ☐ I can explain what a share of stock is, how a stock exchange works and why diversification lowers risk.
- ☐ I can explain what a bond is, calculate its interest payments and current yield, and tell why paying debts faithfully builds trust.
- ☐ I can calculate the interest on a credit-card balance and explain why paying only the minimum is costly.
- ☐ I can make a give-save-spend plan for money I earn and explain it at the family market day.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **John Wesley, “The Use of Money” (sermon, 1760)**: Free at the Wesley Center Online. Wesley’s three rules: gain all you can, save all you can, give all you can. Read the last section aloud with Lesson 8.4. Ages 11 and up with a parent.
- **Next Gen Personal Finance (NGPF)**: Free personal-finance lessons, calculators and games on saving, investing and credit, written for middle- and high-school students. A parent can preview and choose activities for Lessons 8.1 and 8.4.
- **Investor.gov (U.S. Securities and Exchange Commission)**: Free. The government’s plain-language site about stocks, bonds and avoiding fraud, with a compound-interest calculator. Use it with a parent to check your answers in Lesson 8.1.

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 Compound Interest with a Formula: Henry Duncan’s Savings Bank

8.2 Stocks and the New York Stock Exchange

2 sessions of 50 minutes

8.3 Bonds: Lending to Governments and Companies

2 sessions of 50 minutes

8.4 Credit, Debt, Giving and the Family Market Day

2 sessions of 50 minutes

UNIT 8 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. **8 pts**

Why did Henry Duncan open a savings bank in Ruthwell in 1810?

2. **10 pts**

Find the simple interest and the compound amount for \$500 at 4% for 3 years.

3. **6 pts**

Use the rule of 72 to estimate how long it takes money to double at 9% a year.

4. **8 pts**

What is a share of stock, and in what two ways can a shareholder gain?

5. **10 pts**

You buy a share for \$50. A year later it pays a \$1.50 dividend and its price is \$54. Find the dividend yield (on your purchase price) and the percent gain in price.

6. **8 pts**

What was the Buttonwood Agreement, and what did the Dow Jones Industrial Average of 1896 measure?

7. **8 pts**

Explain diversification and why it lowers risk.

8. **10 pts**

A \$1,000 bond has a 5% coupon and matures in 8 years. How much interest does it pay each year and in total? If you buy it for \$1,250, what is its current yield?

9. **8 pts**

What did Alexander Hamilton's plan of 1790 do, and why did it give the United States good credit?

10. **10 pts**

A credit card has a \$400 balance at 18% APR. Find the monthly rate and the first month's interest. If you pay \$15, what is the new balance?

11. **6 pts**

State John Wesley's three rules for the use of money.

12. **8 pts**

Short answer: Explain why compound interest is a friend to savers and an enemy to borrowers. Use Proverbs 22:7 or Romans 13:8 in your answer.

ANSWER KEY

1. The poor families of his parish had no safe place to save small amounts and earn interest, because ordinary banks did not want tiny deposits. He wanted them to be able to save for illness, old age and hard times, and to gain the dignity of providing for themselves.
2. Simple interest = $500 \times 0.04 \times 3 = \$60$ (total \$560). Compound: $A = 500 \times (1.04)^3 = 500 \times 1.124864 \approx \$562.43$. Compound interest earns about \$2.43 more.
3. $72 \div 9 =$ about 8 years.
4. A unit of ownership in a corporation. A shareholder can gain from dividends (a share of the profits) and from a rise in the share price.
5. Dividend yield = $1.50 \div 50 \times 100 = 3\%$. Price gain = $(54 - 50) \div 50 \times 100 = 8\%$.
6. On May 17, 1792, twenty-four New York brokers agreed to trade with each other at fixed commissions, the beginning of the New York Stock Exchange. The Dow Jones Industrial Average was an average of the prices of twelve large industrial companies, showing whether the market was rising or falling.
7. Diversification means spreading savings among many different investments. If one company does badly or fails, the loss is only a small part of the whole, so the saver is not ruined.
8. Yearly interest = $1,000 \times 0.05 = \$50$; total = $50 \times 8 = \$400$. Current yield = $50 \div 1,250 \times 100 = 4\%$.
9. The federal government took over the state war debts along with its own, exchanged old certificates for new bonds, and paid the interest regularly from customs duties. Because it kept its promises, lenders trusted American bonds, and the nation could borrow cheaply.
10. Monthly rate = $18 \div 12 = 1.5\%$. Interest = $400 \times 0.015 = \$6$. New balance = $400 + 6 - 15 = \$391$.
11. Gain all you can (by honest work that harms no one); save all you can (avoid waste); give all you can.
12. Compound interest makes a saver's money grow faster each year because interest earns interest. For a borrower, unpaid interest is added to the debt and charged interest too, so the debt grows and takes more and more of his income. "The borrower is servant to the lender" (Proverbs 22:7): high-interest debt takes away future freedom, while saving builds it. (Accept any clear answer using a verse.)

PORTFOLIO PIECE: MY YEAR-END MONEY PLAN AND MARKET-DAY REPORT

Write a two-page report. Part 1, the market day: your product, how you priced it, your sales ledger, your cash-box count, a short income statement and how you divided your profit among give, save and spend. Part 2, a plan for the next year: a monthly give-save-spend budget for money you expect to earn, a compound-interest table showing what your savings could grow to in five years at a stated rate, and a paragraph on how you will avoid needless debt. End with one paragraph on what you learned this year about work, honesty and stewardship, quoting one verse.

LOOK FOR	WHAT IT MEANS
Market-day records	Complete sales ledger, balanced cash count and a correct income statement for the day.
Calculations	The budget and compound-interest table are correct, with formulas and units shown.
Stewardship	A thoughtful give-save-spend plan and a sensible plan for avoiding debt, with reasons.
Presentation	Neat, organized pages with headings, tables and complete sentences.

8.1 COMPOUND INTEREST WITH A FORMULA:

HENRY DUNCAN'S SAVINGS BANK

OBJECTIVES

- Tell how the Reverend Henry Duncan founded a savings bank for poor families in Ruthwell, Scotland, in 1810.
- Tell the difference between simple and compound interest.
- Use the formula $A = P(1 + r)^n$ and the rule of 72.
- Build a compound-interest table and compare saving early with saving late.

Warm-up. Would you rather have \$1,000 today, or a penny today that doubles every day for 30 days? Guess first, then work out the first ten days on paper. What do you notice?

WATCH

[Compound interest introduction](#) | [Interest and debt](#) | [Finance & Capital Markets](#) | [Khan Academy](#)

[Khan Academy](#) • 6:37

<https://www.youtube.com/watch?v=Rm6UdfRs3gw>

WHEN TO WATCH

After the story, before the big idea. Pause after the first year's interest and work the second year yourself.

BACKUP VIDEO

[Growing Money - No-Frills Money Skills](#)

[Federal Reserve Bank of St. Louis](#) • 7:21

<https://www.youtube.com/watch?v=aqu8pALMtOs>

After the project, to see why starting early matters, from the St. Louis Fed.

KEY TERMS

principal

The amount of money first saved, invested or borrowed, before any interest.

simple interest

Interest paid only on the principal:
 $\text{interest} = \text{principal} \times \text{rate} \times \text{years}.$

compound interest

Interest paid on the principal and on the interest already earned, so savings grow faster each year.

compound-interest formula

$A = P(1 + r)^n$, where P is the principal, r is the yearly rate as a decimal, n is the number of years and A is the amount at the end.

rule of 72

A shortcut: years to double $\approx 72 \div$ the interest rate in percent.

savings bank

A bank set up to help ordinary people save small amounts safely and earn interest.

CORE IDEAS

The story. Henry Duncan was born in 1774 in Scotland, the son of a minister. As a young man he worked for a time in a bank in Liverpool before he too became a minister, and in 1799 he was called to the parish of Ruthwell, a poor farming village near the Solway coast. He saw families who had nothing put aside when illness, old age or a bad harvest came. Ordinary banks of that time did not want the tiny deposits of laborers. So in May 1810, in a small cottage in his village, Duncan opened a bank for his parishioners. They could deposit even small sums, the money was kept safe and earned interest, and the accounts were kept by the parish's trustworthy members with careful rules.

How they figured it out. Duncan wanted to encourage thrift, not charity alone: he believed that families who saved for themselves gained dignity and independence. He wrote and spoke widely about his parish bank, explaining its rules so that others could copy them. Within a few years, savings banks had opened across Scotland and England, and soon in America too: the Philadelphia Saving Fund Society and the Provident Institution for Savings in Boston both opened in 1816. In 1817 Parliament passed a law to regulate and protect savings banks. Millions of working families opened their first savings accounts in the century that followed. The Savings Bank Museum still stands in the cottage in Ruthwell.

The big idea. With **simple interest**, you earn interest only on the **principal**: \$100 at 5% for 10 years earns $\$100 \times 0.05 \times 10 = \$50$, for a total of \$150. With **compound interest**, each year's interest is added to the balance and earns interest itself. The formula is $A = P(1 + r)^n$. For \$100 at 5% for 10 years: $A = 100 \times (1.05)^{10} \approx 100 \times 1.629 = \$162.89$. That is \$12.89 more than simple interest, and the difference grows larger

every year. The **rule of 72** estimates how long money takes to double: at 6%, about $72 \div 6 = 12$ years. Time is the saver's greatest friend: \$100 left for 40 years at 6% grows to about $100 \times (1.06)^{40} \approx \$1,029$.

Think it through. Compound interest works the other way for borrowers: a debt left unpaid grows in exactly the same way. And interest is only as good as the honesty of the bank and the borrowers it lends to, which is why Duncan's bank kept such careful rules. Scripture praises steady, patient saving: "he that gathereth by labour shall increase" (Proverbs 13:11).

In business today. Savings accounts, certificates of deposit and many investments grow by compound interest, and banks are required to tell savers the interest rate they pay. A young person who begins saving a little regularly, and leaves it to grow, can build far more than someone who begins much later with larger amounts. With a parent, a student may open a savings account; this course asks only for practice with numbers.

PICTURE STUDY



“Loose in Your Pocket ... Safe in the Post Office Savings Bank”, Unknown designer, for the British Post Office Savings Bank, mid-20th century · Printed poster

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

The savings banks that grew from Henry Duncan’s idea were joined in 1861 by the British Post Office Savings Bank, which let people save small sums at any post office. Posters like this one encouraged ordinary families to put spare coins in the bank instead of carrying them about and spending them.

Look closely

- Read the slogan. What two places for money does the poster compare?
- Look at the pictures and colors. How does the designer make one choice look better than the other?
- Look for any numbers or promises on the poster.

Talk about it

1. Why might money “loose in your pocket” disappear faster than money in a savings bank?
2. Is this poster honest persuasion? What would make it dishonest?
3. How would compound interest make the poster’s point even stronger?

PROJECT

The Compound-Interest Contest

You will build compound-interest tables by hand and with the formula, compare simple and compound interest, and compare two savers: one who starts early and stops, and one who starts late and keeps going.

You will need

- Ledger notebook or a free spreadsheet
- A calculator (one with a power key, x^y or $^$, is helpful)

Steps

1. Make a table for \$200 at 6% for 10 years: Year, Starting balance, Interest (balance $\times$ 0.06), Ending balance. Fill in each year by hand.
2. Check your year-10 answer with the formula: $A = 200 \times (1.06)^{10}$.
3. Calculate simple interest on \$200 at 6% for 10 years. How much more did compound interest earn?
4. Use the rule of 72 to estimate how long \$200 takes to double at 3%, 6%, 8% and 12%. Then check one with the formula.
5. **The contest (practice numbers, 6% a year).** Saver A puts in \$100 at the start of each year from age 12 to 21 (10 deposits), then stops. Saver B puts in \$100 each year from age 22 to 41 (20 deposits). Use a spreadsheet, or work in 5-year steps with a parent, to find each saver's balance at age 41.
6. Who has more at 41? Who put in more money? Write what this shows about time.
7. Write a paragraph: What could you save regularly now? What would it grow to by age 25 at 5%?

Tips

- In a spreadsheet: put 200 in cell B2, and in B3 type $=B2*1.06$, then copy the formula down.
- Remember to change the percent to a decimal: 6% = 0.06, so $(1 + r) = 1.06$.

Check your work

- ☐ I built a compound-interest table and checked it with $A = P(1 + r)^n$.

- ☐ I can explain the difference between simple and compound interest.
- ☐ I can use the rule of 72.

LEDGER NOTEBOOK

1. Copy the formula $A = P(1 + r)^n$ in a box and label each letter.
2. Draw a graph of \$100 at 6% for 40 years, plotting the balance every 10 years. Draw a straight line for simple interest beside it.
3. Make a timeline: 1774 Henry Duncan born; 1799 minister at Ruthwell; 1810 Ruthwell savings bank; 1816 first American savings banks; 1817 Savings Banks Act.
4. Write one sentence about why Duncan thought saving gave families dignity.

From history. Henry Duncan also loved history. In his parish church lay the broken pieces of the Ruthwell Cross, a great carved stone cross from about the 700s with scenes from the Gospels and lines of an old English poem about the crucifixion. Duncan gathered the pieces and set the cross up again in 1823, and it still stands in Ruthwell church.

COMMON MISTAKES

- Forgetting to change the percent to a decimal in the formula.
- Multiplying the rate by the years for compound interest. That is simple interest; compound interest multiplies by $(1 + r)$ once for each year.
- Thinking small amounts do not matter. With time, small regular savings grow large.

Make it a game • Doubling Duel. Your parent names a savings rate, such as 6 percent. Use the rule of 72 to guess how many years money takes to double. Then check by compounding ten pretend dollars year by year. The closest guess wins a point. Finish by telling how Henry Duncan's savings bank helped poor families in Ruthwell in 1810.

Scripture. “Wealth gotten by vanity shall be diminished: but he that gathereth by labour shall increase.” (Proverbs 13:11, KJV)

Quick, showy gains melt away, but steady saving from honest work grows. Compound interest is the arithmetic of this proverb.

8.2 STOCKS AND THE NEW YORK STOCK EXCHANGE

OBJECTIVES

- Tell how the New York Stock Exchange grew from the Buttonwood Agreement of 1792 and the rules of 1817.
- Explain what a share of stock is and how a shareholder can gain or lose.
- Calculate a stock's percent gain or loss and its dividend yield.
- Explain diversification and keep a practice portfolio with pretend money.

Warm-up. Your neighbor's bakery needs \$1,000 for a new oven. Ten friends each give \$100 and get a written promise of one-tenth of the bakery's profits. What happens to each friend if the bakery does very well? If it closes? Write your answers.

WATCH

Get Into Stocks - No-Frills Money Skills

Federal Reserve Bank of St. Louis • 9:14

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

WHEN TO WATCH

After the story of the exchange, before the big idea.

Note: From the St. Louis Fed: the story of an ice-cream cart owner who sells shares to grow her business.

KEY TERMS

stock (share)

A unit of ownership in a corporation. A shareholder owns a small part of the company and may share in its profits.

stock exchange

An organized market where brokers buy and sell shares under agreed rules.

dividend

A part of a company's profit paid out to its shareholders, usually so much per share.

dividend yield

A stock's yearly dividend as a percent of its price: $\text{dividend} \div \text{price} \times 100$.

stock index

A number that tracks the prices of a group of stocks to show how the market as a whole is doing, such as the Dow Jones Industrial Average.

diversification

Spreading savings among many different investments so that a loss in one does not ruin the whole.

CORE IDEAS

The story. In the 1790s, men in New York bought and sold shares of the new nation's banks and its government bonds on the street, under a buttonwood (sycamore) tree on Wall Street. On May 17, 1792, twenty-four brokers signed the Buttonwood Agreement, promising to trade with each other at fixed commissions. In 1817 they wrote a constitution and moved indoors as the New York Stock & Exchange Board, which took the name New York Stock Exchange in 1863. Prices were called out in a busy room, and from 1867 the new stock ticker printed them on paper tape and sent them by telegraph across the country. In 1896 a journalist named Charles Dow began publishing an average of the prices of twelve large industrial companies, the Dow Jones Industrial Average, so readers could see at a glance whether the market was rising or falling.

How they figured it out. Building railroads, steel mills and factories took more money than any one person had. A **corporation** could sell thousands of **shares** to many people, each risking only what he put in. A stock exchange made those shares easy to buy and sell, because an owner who needed his money back did not have to wait for the company to repay him; he could sell his shares to someone else. Rules and honest records were essential: the exchange set rules for its members, and after the crash of 1929, which you will study in Grade 7, Congress required companies to publish truthful reports.

The big idea. A shareholder can gain in two ways: **dividends** (a share of the profits) and a rise in the share price. He can also lose: profits may fall, dividends may stop, the price may drop, and a company that fails can leave its shares worth nothing. Two calculations: *percent gain* = $(\text{new price} - \text{old price}) \div \text{old price} \times 100$; if you buy at \$40 and the price rises to \$46, the gain is $6 \div 40 \times 100 = 15\%$. *Dividend yield* = $\text{yearly dividend} \div \text{price} \times 100$; a \$1.20 dividend on a \$40 share is a 3% yield. Because no one knows which companies will do well, wise investors practice **diversification**, owning small pieces of many companies, often through funds that hold a whole **stock index**. "Give a portion to seven, and also to eight" (Ecclesiastes 11:2).

Think it through. The stock market is not a game of chance or a way to grow wealthy overnight. Buying a share is buying part of a real business, with real workers, customers and risks. Scripture warns, “he that maketh haste to be rich shall not be innocent” (Proverbs 28:20). Patient owners of good businesses, over many years, have usually done well; people who chase quick profits often lose.

In business today. Millions of families own shares, often through retirement plans that hold many companies at once. Companies sell shares to raise money to grow, as in Grade 5’s Buttonwood story. Children cannot buy shares on their own, and this course uses only pretend money; but learning how ownership works prepares you to be a careful steward when you are older.

PICTURE STUDY



The Courtyard of the Exchange in Amsterdam, Emanuel de Witte, 1653 · Oil on panel · Museum Boijmans Van Beuningen, Rotterdam

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

Amsterdam's Exchange, built in 1611, was one of the first buildings ever made for trading. Shares of the Dutch East India Company were bought and sold here, along with grain, spices and cloth. Merchants met at numbered pillars where traders in certain goods gathered, much as brokers later gathered at posts on the floor of the New York Stock Exchange.

Look closely

- Find the tall stone pillars around the courtyard. Merchants who dealt in the same goods often gathered at the same pillar. Why would that help?
- Count the groups of men talking. What might they be agreeing on?
- Look at their clothes. What does the plain black tell you about Dutch merchants of that time?
- Look for any people who are not merchants.

Talk about it

1. How is this courtyard like the New York Stock Exchange? How is it different?
2. Why would merchants want one meeting place instead of trading all over the city?

3. What rules would a meeting place like this need so that people could trust each other's promises?

Safety first. This project uses pretend money only. A parent views any financial websites with you; never sign up, enter personal information or follow ads promising quick profits.

PROJECT

A Practice Portfolio

With \$10,000 of pretend money, you will build a practice portfolio of companies whose products you know, track the prices for four weeks with a parent, calculate gains, losses and dividend yields, and compare your portfolio with a broad index.

You will need

- A newspaper's business pages or a financial website, viewed with a parent
- Ledger notebook or a free spreadsheet
- A calculator

Steps

1. Choose five companies whose products your family uses, in at least three different industries (for example, food, tools, transportation, medicine, stores).
2. With a parent, look up each company's share price and yearly dividend. Pretend to invest \$2,000 in each. Calculate how many shares you can buy ($2,000 \div \text{price}$, rounded down) and the cash left over.
3. Calculate each company's dividend yield.
4. Each week for four weeks, record each price and the value of your holding (shares $\times$ price). Record the value of a broad index, such as the S&P 500, too.
5. At the end, calculate the percent gain or loss for each company, for your whole portfolio and for the index.
6. Imagine you had put all \$10,000 in your best company, and then in your worst. Calculate both results. What does this show about diversification?
7. Write a paragraph: What did you learn about risk? Why is four weeks too short to judge an investment? Which stakeholders of each company did you think about when you chose it?

Tips

- This is practice only. Do not open any account or enter any personal information on a website.
- Prices go up and down every day. Look for patterns over weeks, not single days.

Check your work

- ☐ I can explain what owning a share means.
- ☐ I calculated percent gains or losses and dividend yields.
- ☐ I can explain why diversification lowers risk.

LEDGER NOTEBOOK

1. Make a timeline: 1611 Amsterdam Exchange; May 17, 1792 Buttonwood Agreement; 1817 New York Stock & Exchange Board; 1863 New York Stock Exchange; 1867 stock ticker; 1896 Dow Jones Industrial Average.
2. Copy the two formulas (percent gain and dividend yield) and work one example of each.
3. Draw a pie chart of your practice portfolio at the start and at the end.
4. Write three warning signs of a “quick fortune” scheme and the Bible verse that warns against it.

From history. The Dow Jones Industrial Average began with twelve companies in 1896, making things like cotton oil, sugar, leather, rubber and electric equipment. The list has been changed many times since, as industries rose and fell. General Electric, one of the original twelve, stayed in the average longer than any other, until 2018.

COMMON MISTAKES

- Thinking a stock price always goes up. Prices can fall, and companies can fail.
- Putting everything in one company. Diversification protects against one company’s bad luck or bad management.
- Thinking the stock market is a game of chance. It is ownership of real businesses, though impatient speculation can turn it into something close to one.

Make it a game • Yield Quick-Draw. Your parent holds up a stock price and a yearly dividend, such as 50 and 2. You calculate the dividend yield before they count to ten. Do ten rounds in a row and keep your score. Say what a stock is, how a shareholder can gain or lose, and why diversification matters.

Scripture. “A faithful man shall abound with blessings: but he that maketh haste to be rich shall not be innocent.” (Proverbs 28:20, KJV)

Patient ownership of good businesses rewards faithfulness over time. Rushing after riches tempts people to take foolish risks and to cut moral corners.

8.3 BONDS: LENDING TO GOVERNMENTS AND COMPANIES

OBJECTIVES

- Tell how Alexander Hamilton's plan of 1790 put the new nation's debts in order.
- Explain what a bond is: face value, coupon rate, maturity and default.
- Calculate a bond's yearly interest and its current yield, and explain why bond prices fall when interest rates rise.
- Compare the risk and reward of bonds and stocks.

Warm-up. A friend borrowed \$10 from you last month and promised to pay it back with \$1 extra next week. Another friend borrowed \$10 and has not paid back the last two loans. If each asks to borrow again, would you lend the same way to both? What would you ask for from the second friend?

WATCH

Introduction to bonds | Stocks and bonds | Finance & Capital Markets | Khan Academy

Khan Academy • 8:41

https://www.youtube.com/watch?v=Qh-M3_L4xYk

WHEN TO WATCH

After the story of Hamilton, before the big idea. Pause when the coupon payments are drawn and add them up yourself.

BACKUP VIDEO

What are Bonds?

IMF • 3:17

<https://www.youtube.com/watch?v=PBH-Vgwnekw>

A shorter overview from the International Monetary Fund, if the main video is too detailed.

KEY TERMS

bond

A written promise by a borrower, such as a government or company, to pay interest at set times and repay the amount borrowed on a set date.

face value

The amount the borrower promises to repay when the bond matures, often \$1,000.

coupon rate

The yearly interest rate the bond pays on its face value. $\text{Yearly interest} = \text{face value} \times \text{coupon rate}$.

maturity

The date on which the borrower must repay the face value.

current yield

A bond's yearly interest as a percent of the price you pay for it: $\text{yearly interest} \div \text{price} \times 100$.

credit

Trust that a borrower will repay; a borrower with good credit can borrow more cheaply.

CORE IDEAS

The story. When the War of Independence ended, the United States owed large debts to France, to Dutch bankers and to its own citizens, including soldiers and farmers who had been paid in paper certificates. The states owed more. Under the Articles of Confederation, Congress had no steady income and often could not even pay the interest. The certificates were traded at a small fraction of their face value, because few people believed they would ever be paid. In January 1790, the first Secretary of the Treasury, Alexander Hamilton, sent Congress his *Report on Public Credit*. He argued that a nation that kept its promises would be able to borrow in a crisis, and one that did not would be trusted by no one.

How they figured it out. Hamilton proposed that the federal government take over the states' war debts along with its own, exchange the old certificates for new government **bonds**, and pay the interest regularly, out of customs duties collected at the ports. Congress passed the plan in August 1790 after long debate. Not everyone thought it fair: many soldiers had sold their certificates cheaply to buyers who now received full value, and some states had already paid off their debts. But the plan worked. The government paid its interest on time, the new bonds rose toward full

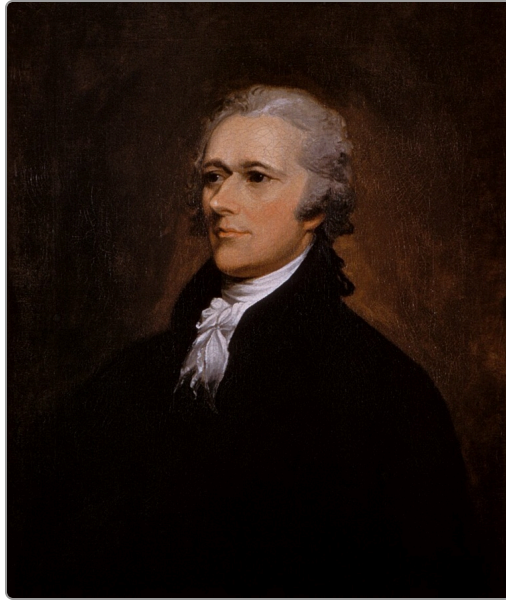
value, and within a few years European lenders regarded American bonds as among the safest in the world. The nation had gained good **credit**.

The big idea. A bond is a loan in writing. Its **face value** is what will be repaid at **maturity**; its **coupon rate** sets the yearly interest. A \$1,000 bond with a 4% coupon pays $\$1,000 \times 0.04 = \$40$ a year; over 10 years that is \$400 in interest, and then the \$1,000 is repaid. Bonds can be bought and sold before maturity, and their prices move. If you buy that bond for \$800, its **current yield** is $40 \div 800 \times 100 = 5\%$. When new bonds start paying higher interest, old bonds with lower coupons are worth less, so their prices fall; when rates fall, old bonds become more valuable. The great risk is **default**: a borrower who cannot pay. Lenders demand higher interest from borrowers who are less trustworthy.

Think it through. Bonds are usually less risky than stocks, because bondholders are promised fixed payments and are paid before shareholders if a company fails. But they usually earn less, and inflation can eat away the value of fixed payments (Lesson 2.4). Many investors hold both. Scripture describes the character a good borrower must have: “The wicked borroweth, and payeth not again” (Psalm 37:21). A nation, a company or a person who repays faithfully earns trust, and trust lowers the cost of every future loan.

In business today. Governments sell bonds to pay for roads, schools and other needs, and the U.S. Treasury sells savings bonds and Treasury bonds directly to the public. Companies sell bonds to build factories. Families buy bonds, often through funds, to earn steady interest. Agencies rate bonds by how likely the borrower is to repay, and a lower rating means the borrower must pay more interest.

PICTURE STUDY



Alexander Hamilton, John Trumbull, 1806 · Oil on canvas

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

John Trumbull, who had served as an officer in the War of Independence, painted Hamilton several times. This portrait was painted in 1806, two years after Hamilton's death, from Trumbull's earlier work. It is the portrait on which the engraving on today's \$10 bill is based.

Look closely

- Look at his face and pose. What qualities does the painter want you to see?
- Look at his clothes. Are they showy or plain for a gentleman of his time?
- Compare this face with the portrait on a \$10 bill, if you have one.

Talk about it

1. Why would a portrait of the first Secretary of the Treasury be placed on American money?
2. Hamilton believed that paying debts faithfully would make the nation strong. Do you agree? Why?
3. Which stakeholders gained most from Hamilton's plan, and who felt it was unfair?

PROJECT

Bond Desk: Interest, Yield and a Bond Ladder

You will calculate the interest and yields of several practice bonds, see how bond prices change with interest rates, and build a “bond ladder” that repays money at different times.

You will need

- Ledger notebook and calculator
- Index cards to make pretend bond certificates

Steps

1. Make three pretend bond certificates: Town Water Bond, \$1,000 face, 3% coupon, 5 years; Railroad Company Bond, \$1,000 face, 6% coupon, 10 years; Toy Company Bond, \$500 face, 9% coupon, 3 years.
2. For each, calculate the yearly interest and the total interest to maturity.
3. Rank the three by risk of default and explain why the riskiest pays the highest rate.
4. **Rates change.** New 10-year bonds now pay 8%. Would anyone pay the full \$1,000 for your 6% Railroad bond? Find the price at which its \$60 a year gives a current yield of 8% ($\text{price} = 60 \div 0.08$).
5. Now suppose new bonds pay only 4%. At what price would the Railroad bond give a 4% yield? Write a sentence about which way bond prices move when rates rise and fall.
6. **A bond ladder.** With \$3,000 of pretend money, buy three \$1,000 bonds maturing in 1, 2 and 3 years at 3%, 3.5% and 4%. Make a table showing the interest and the money repaid each year.
7. Write a paragraph: Would you rather own a bond or a share of the same company? Why? What did Hamilton’s plan teach about trust?

Tips

- Railroad bond at 8%: $60 \div 0.08 = \$750$. At 4%: $60 \div 0.04 = \$1,500$. Check your work against these.
- Always change the percent to a decimal before dividing or multiplying.

Check your work

- ☐ I can calculate a bond's yearly interest and current yield.
- ☐ I can explain why bond prices fall when interest rates rise.
- ☐ I can compare the risks of bonds and stocks.

LEDGER NOTEBOOK

1. Design a bond certificate with a face value, a coupon rate, a maturity date, the borrower's promise and a signature line.
2. Make a timeline: 1783 the war ends with large debts; January 1790 *Report on Public Credit*; August 1790 Congress passes the plan; 1790s American credit grows strong.
3. Make a two-column chart: Stocks and Bonds. Compare what you own, how you are paid, the risk and the usual reward.
4. Write one sentence explaining why a borrower with good credit pays less interest.

From history. Hamilton also proposed the first Bank of the United States, chartered in 1791, and a national mint. Before he became Secretary of the Treasury, he had been George Washington's aide during the war. In his twenties he had worked as a clerk for a trading firm in the West Indies, where he learned bookkeeping, exchange rates and the business of ships and cargoes.

COMMON MISTAKES

- Thinking a bond makes you an owner. A bondholder is a lender; a shareholder is an owner.
- Thinking bonds have no risk. Borrowers can default, and inflation and rising rates can lower a bond's value.
- Calculating yield on the face value when the bond was bought at a different price. Current yield uses the price you pay.

Make it a game • Issue a Bond. Draw a bond on paper with face value, coupon rate, maturity date and issuer. Sell it to your parent for ten beans. Each year, pay the coupon in beans, and at maturity repay the face value. On one round flip a coin for default. Tell how Hamilton's 1790 plan put the nation's debts in order.

Scripture. "The wicked borroweth, and payeth not again: but the righteous sheweth mercy, and giveth." (Psalm 37:21, KJV)

Repaying what we borrow is a mark of righteousness, for nations and for people. Hamilton's plan rested on the simple truth that a borrower must keep his word.

8.4 CREDIT, DEBT, GIVING AND THE FAMILY MARKET DAY

OBJECTIVES

- Tell how charge cards and credit cards began, from Diners Club in 1950 to BankAmericard in 1958.
- Calculate monthly interest on a credit-card balance and the cost of paying only the minimum.
- Explain the Bible's teaching on debt and generosity and John Wesley's three rules.
- Plan, run and keep the books for a family market day, and divide the earnings among give, save and spend.

Warm-up. Look at a store receipt or a bill in your house (with a parent). Was it paid with cash, a debit card or a credit card? What is the difference between the last two? Write what you think happens to the money in each case.

WATCH

Financial Literacy—Debit and Credit | Learn the difference and when to use which

[Learn Bright](#) · 5:10

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

WHEN TO WATCH

After the story of the first credit cards, before the big idea.

KEY TERMS

credit card

A card that lets you borrow from a bank to pay for purchases. If you do not pay the whole bill each month, the bank charges interest on the balance.

debit card

A card that takes money straight out of your own bank account; you are spending money you already have.

APR

Annual percentage rate: the yearly interest rate on a loan or card balance.
Monthly rate $\approx$ APR $\div$ 12.

minimum payment

The smallest amount a card company lets you pay each month. Paying only the minimum keeps the debt alive for a long time and costs much more in interest.

generosity

Giving freely and cheerfully to God's work and to people in need.

CORE IDEAS

The story. In 1950 a New York businessman named Frank McNamara and his partner Ralph Schneider started Diners Club. The story is often told that McNamara had forgotten his wallet at a restaurant dinner and wanted a way to “sign now and pay later.” Diners Club members could sign for meals at certain restaurants and pay one bill at the end of the month. In 1958, in Fresno, California, the Bank of America mailed about 60,000 BankAmericards to its customers without their asking. Unlike a charge card, this new credit card let customers pay part of the bill and carry the rest from month to month, with interest. Many people ran up debts they could not pay, and the bank lost a great deal at first, but credit cards spread across the country and the world.

How they figured it out. A credit card is a loan. If you pay the whole bill each month, it costs you nothing in interest and is simply a safe way to pay. But if you leave a balance, interest is charged on it. Card interest rates are usually much higher than savings rates. Example: a card with an APR of 24% charges about $24 \div 12 = 2\%$ a month. On a \$500 balance, the first month's interest is $\$500 \times 0.02 = \$10$. If you pay only a \$15 minimum, just \$5 goes toward the debt, and next month you owe \$495, with interest charged again. At that pace the debt lasts for years, and you may pay back much more than you borrowed. Compound interest, which helps a saver, now works against the borrower.

The big idea. Scripture is plain: “the borrower is servant to the lender” (Proverbs 22:7), and “Owe no man any thing, but to love one another” (Romans 13:8). Borrowing is not always wrong; a careful loan for a house or a business may be wise. But debt for things that are quickly used up, at high interest, takes away tomorrow's

freedom to pay for today's wants. In 1760 John Wesley preached three rules for "The Use of Money": gain all you can, by honest work that harms no one; save all you can, by avoiding waste; and give all you can. Paul told the Ephesians to work "that he may have to give to him that needeth" (Ephesians 4:28), and "God loveth a cheerful giver" (2 Corinthians 9:7).

Try it. This year ends with a **family market day**. You will set up a table showing your best project from each unit with its ledger pages, sell or show something you have made, keep the books for the day and explain to your guests how you priced your product, what it cost and what you earned. Then you will divide what you earn among three jars, Give, Save and Spend, and explain your choice. A common plan is to give at least a tenth, save a good part, and spend the rest wisely.

In business today. Families and businesses use credit every day. Wise ones pay card balances in full, borrow only for things that last or produce income, compare interest rates, and keep their promises to lenders. And generous people find that giving, planned and cheerful, is one of the great joys of earning money.

PICTURE STUDY



The Return of the Prodigal Son, Rembrandt van Rijn, about 1668 · Oil on canvas · State Hermitage Museum, Saint Petersburg

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

Rembrandt painted this scene from Jesus' parable in Luke 15 near the end of his own life, after he had known great wealth and then bankruptcy. The younger son had taken his inheritance and "wasted his substance with riotous living" until he had nothing; the father welcomes him home with mercy.

Look closely

- Look at the son's clothes and shoes. What do they tell you about what happened to his money?
- Look at the father's hands. What do they show?
- Find the older brother standing at the right. How does he seem to feel?

Talk about it

1. What choices led the younger son from wealth to poverty? Which of them are like the dangers of debt?
2. How does the father show generosity? What does it cost him?
3. Rembrandt himself went bankrupt in 1656 after spending more than he earned. How might that have shaped the way he painted this story?

Safety first. A parent supervises the market day and keeps the cash box nearby. Sell only to family and invited guests you know. Check your town's rules before selling food, and handle food safely. Never apply for a card or share card numbers online.

PROJECT

Pay Off the Card, then Run the Family Market Day

First you will track a practice credit-card debt month by month to see the cost of paying only the minimum. Then you will plan, run and keep the books for your family market day, and divide your earnings among give, save and spend.

You will need

- Ledger notebook or a free spreadsheet and a calculator
- Your best project from each unit and its ledger pages
- Something you have made to sell or show, price tags, a cash box and change, and Give, Save and Spend jars

Steps

1. **The card.** Start with a \$600 balance at 2% a month (24% APR). Make a table: Month, Starting balance, Interest ($\text{balance} \times 0.02$), Payment, Ending balance.
2. Plan A: pay only \$20 a month. Fill in six months. How much of the \$120 you paid went to interest? How much is still owed?
3. Plan B: pay \$100 a month. Fill in months until it is paid off. Compare the total interest in Plan A's first six months and in all of Plan B.
4. **Market day plan.** Choose your product, price it using your costs and Unit 3 demand survey, make price tags and an honest sign, and set up a display of your year's work.
5. Prepare a cash box with a recorded starting amount of change, and a sales ledger: Time, Item, Price, Cash received, Change given.
6. Hold the market day with your family and invited guests. Explain to each visitor how you priced your product and one thing you learned this year.
7. Close the books: count the cash, subtract the starting change, and check that it matches your sales ledger. Prepare a short income statement for the day ($\text{revenue} - \text{costs} = \text{profit}$).
8. Divide your profit among the Give, Save and Spend jars. Write a paragraph explaining your choice, using Wesley's three rules and at least one verse from this unit.

Tips

- Plan A, month 1: interest \$12, payment \$20, balance \$592. Check your work against this.
- Decide where your Give money will go before the market day: your church, a missionary, a neighbor in need or another good cause your family supports.

Check your work

- ☐ I can calculate monthly interest on a card balance and the cost of paying only the minimum.
- ☐ I kept a sales ledger and balanced the cash box at the end of market day.
- ☐ I divided my earnings among give, save and spend and explained my plan.

LEDGER NOTEBOOK

1. Copy your Plan A and Plan B tables and draw a line graph of the balance for each.
2. Write Wesley's three rules, and beside each, one way you will practice it this year.
3. Draw your market-day table from above, labeling each unit's project, the price tags and the cash box.
4. Write the verse from this unit that meant the most to you, and one sentence about why.

From history. When Bank of America mailed its first credit cards in Fresno in 1958, it did not check carefully who could repay, and many accounts were never paid. The bank lost millions of dollars in the first years before it learned to lend more carefully. Today, laws require card companies to show customers how long it will take to repay a balance if they make only the minimum payments.

COMMON MISTAKES

- Thinking a credit card is free money. It is a loan, and unpaid balances grow with interest.
- Confusing a debit card with a credit card. A debit card spends your own money; a credit card borrows.
- Waiting to decide about giving until the money is spent. Set aside the Give portion first.

Make it a game • Minimum Payment Trap. Borrow twenty beans on a pretend card. Each month add two beans of interest, then pay only the minimum, one bean. Play six months and see the balance. Replay paying six beans a month. Compare the total cost. Explain APR, and how Diners Club began the story of charge cards in 1950.

Scripture. “Owe no man any thing, but to love one another: for he that loveth another hath fulfilled the law.” (Romans 13:8, KJV)

The only debt Paul wants us to carry forever is the debt of love. Paying what we owe, and avoiding needless debt, frees us to give generously.

UNIT 8

SAVING, INVESTING AND GIVING

Money that is saved and wisely invested can grow, because it earns interest and the interest earns interest. In this unit you will learn the **compound-interest formula**, $A = P(1 + r)^n$, and use it with real numbers, starting from the story of Henry Duncan, a Scottish minister who opened a savings bank for the poor families of his parish in 1810. Then you will learn how **stocks** let people own a share of a business, from the brokers of the New York Stock Exchange to the first stock index, and how **bonds** let people lend to governments and companies, as Alexander Hamilton's plan for the new nation's debts showed.

Last, you will study **credit and debt**: how credit cards work, what interest on a balance really costs, and why Scripture warns that “the borrower is servant to the lender” (Proverbs 22:7). You will finish the year with a **family market day**, showing your best work and something you have made, and deciding how much of what you earn you will save, spend and give. John Wesley put it simply in 1760: gain all you can, save all you can, give all you can. All investing in this course is practice with pretend money.

PREREQUISITES

- Knows simple interest, compound growth, stocks and bonds simply (Grade 5, Unit 8)
- Can use a calculator to multiply repeatedly or use a power key
- Can calculate percents and percent change

MASTERY CHECKLIST

- ☐ I can use $A = P(1 + r)^n$ to calculate compound interest and the rule of 72 to estimate doubling time.
- ☐ I can explain what a share of stock is, how a stock exchange works and why diversification lowers risk.
- ☐ I can explain what a bond is, calculate its interest payments and current yield, and tell why paying debts faithfully builds trust.
- ☐ I can calculate the interest on a credit-card balance and explain why paying only the minimum is costly.
- ☐ I can make a give-save-spend plan for money I earn and explain it at the family market day.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **John Wesley, “The Use of Money” (sermon, 1760)**: Free at the Wesley Center Online. Wesley’s three rules: gain all you can, save all you can, give all you can. Read the last section aloud with Lesson 8.4. Ages 11 and up with a parent.
- **Next Gen Personal Finance (NGPF)**: Free personal-finance lessons, calculators and games on saving, investing and credit, written for middle- and high-school students. A parent can preview and choose activities for Lessons 8.1 and 8.4.
- **Investor.gov (U.S. Securities and Exchange Commission)**: Free. The government’s plain-language site about stocks, bonds and avoiding fraud, with a compound-interest calculator. Use it with a parent to check your answers in Lesson 8.1.

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 Compound Interest with a Formula: Henry Duncan’s Savings Bank

8.2 Stocks and the New York Stock Exchange

2 sessions of 50 minutes

8.3 Bonds: Lending to Governments and Companies

2 sessions of 50 minutes

8.4 Credit, Debt, Giving and the Family Market Day

2 sessions of 50 minutes

UNIT 8 REVIEW

Answer each question. Show your formula, your numbers with units and your answer for every calculation, and use complete sentences for explanations. The review is worth 100 points.

1. **8 pts**

Why did Henry Duncan open a savings bank in Ruthwell in 1810?

2. **10 pts**

Find the simple interest and the compound amount for \$500 at 4% for 3 years.

3. **6 pts**

Use the rule of 72 to estimate how long it takes money to double at 9% a year.

4. **8 pts**

What is a share of stock, and in what two ways can a shareholder gain?

5. **10 pts**

You buy a share for \$50. A year later it pays a \$1.50 dividend and its price is \$54. Find the dividend yield (on your purchase price) and the percent gain in price.

6. **8 pts**

What was the Buttonwood Agreement, and what did the Dow Jones Industrial Average of 1896 measure?

7. **8 pts**

Explain diversification and why it lowers risk.

8. **10 pts**

A \$1,000 bond has a 5% coupon and matures in 8 years. How much interest does it pay each year and in total? If you buy it for \$1,250, what is its current yield?

9. **8 pts**

What did Alexander Hamilton's plan of 1790 do, and why did it give the United States good credit?

10. **10 pts**

A credit card has a \$400 balance at 18% APR. Find the monthly rate and the first month's interest. If you pay \$15, what is the new balance?

11. **6 pts**

State John Wesley's three rules for the use of money.

12. **8 pts**

Short answer: Explain why compound interest is a friend to savers and an enemy to borrowers. Use Proverbs 22:7 or Romans 13:8 in your answer.

ANSWER KEY

1. The poor families of his parish had no safe place to save small amounts and earn interest, because ordinary banks did not want tiny deposits. He wanted them to be able to save for illness, old age and hard times, and to gain the dignity of providing for themselves.
2. Simple interest = $500 \times 0.04 \times 3 = \$60$ (total \$560). Compound: $A = 500 \times (1.04)^3 = 500 \times 1.124864 \approx \$562.43$. Compound interest earns about \$2.43 more.
3. $72 \div 9 =$ about 8 years.
4. A unit of ownership in a corporation. A shareholder can gain from dividends (a share of the profits) and from a rise in the share price.
5. Dividend yield = $1.50 \div 50 \times 100 = 3\%$. Price gain = $(54 - 50) \div 50 \times 100 = 8\%$.
6. On May 17, 1792, twenty-four New York brokers agreed to trade with each other at fixed commissions, the beginning of the New York Stock Exchange. The Dow Jones Industrial Average was an average of the prices of twelve large industrial companies, showing whether the market was rising or falling.
7. Diversification means spreading savings among many different investments. If one company does badly or fails, the loss is only a small part of the whole, so the saver is not ruined.
8. Yearly interest = $1,000 \times 0.05 = \$50$; total = $50 \times 8 = \$400$. Current yield = $50 \div 1,250 \times 100 = 4\%$.
9. The federal government took over the state war debts along with its own, exchanged old certificates for new bonds, and paid the interest regularly from customs duties. Because it kept its promises, lenders trusted American bonds, and the nation could borrow cheaply.
10. Monthly rate = $18 \div 12 = 1.5\%$. Interest = $400 \times 0.015 = \$6$. New balance = $400 + 6 - 15 = \$391$.
11. Gain all you can (by honest work that harms no one); save all you can (avoid waste); give all you can.
12. Compound interest makes a saver's money grow faster each year because interest earns interest. For a borrower, unpaid interest is added to the debt and charged interest too, so the debt grows and takes more and more of his income. "The borrower is servant to the lender" (Proverbs 22:7): high-interest debt takes away future freedom, while saving builds it. (Accept any clear answer using a verse.)

PORTFOLIO PIECE: MY YEAR-END MONEY PLAN AND MARKET-DAY REPORT

Write a two-page report. Part 1, the market day: your product, how you priced it, your sales ledger, your cash-box count, a short income statement and how you divided your profit among give, save and spend. Part 2, a plan for the next year: a monthly give-save-spend budget for money you expect to earn, a compound-interest table showing what your savings could grow to in five years at a stated rate, and a paragraph on how you will avoid needless debt. End with one paragraph on what you learned this year about work, honesty and stewardship, quoting one verse.

LOOK FOR	WHAT IT MEANS
Market-day records	Complete sales ledger, balanced cash count and a correct income statement for the day.
Calculations	The budget and compound-interest table are correct, with formulas and units shown.
Stewardship	A thoughtful give-save-spend plan and a sensible plan for avoiding debt, with reasons.
Presentation	Neat, organized pages with headings, tables and complete sentences.

BONUS: RUN A REAL BUSINESS

This optional bonus unit puts the whole year to work. With a parent as your partner and supervisor, you will run a small real business for one month: write a plan, raise a little start-up money, set up a full set of double-entry books, sell honestly, record every transaction, and close the month with a trial balance, an income statement, a cash-flow summary and a balance sheet. Good choices for a sixth grader include baked goods for neighbors and church friends you know, greeting cards, bookmarks, seedlings, pet sitting, yard help or a simple repair service.

Each lesson pairs your work with a real person who did it well: Ole Kirk Christiansen, the Danish carpenter who began LEGO in hard times; John D. Rockefeller, who kept his first personal ledger at sixteen; Lydia of Thyatira, “a seller of purple”; and R. G. LeTourneau, the machine builder who gave away most of his income. Do this unit after the family market day, over the summer, or alongside the year.

PREREQUISITES

- Has completed Units 6 and 7, or knows business plans, journals, ledgers and the income statement
- Can calculate profit, percents and break-even
- Has a parent willing to supervise and act as partner and banker

MASTERY CHECKLIST

- ☐ I can write a business plan with start-up costs, a price, a break-even point and a sales goal.
- ☐ I can set up a chart of accounts and record the start-up money as owner’s equity or a loan.
- ☐ I can keep a journal, ledger and weekly trial balance for a month of real business.
- ☐ I can prepare an income statement, a cash-flow summary and a balance sheet at the end of the month.
- ☐ I can repay what I owe, decide what to give, and explain what I learned.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Biz Kid\$ (PBS):** Free episodes and resources about young people who started real businesses. Good to watch with a parent while choosing a business in Lesson 9.1.
- **LibreOffice Calc (free spreadsheet):** Free software for keeping your journal, ledger and statements with formulas. A parent installs it. Google Sheets works too, and paper 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

9.1 Write the Plan and Find the Start-up Money

2 sessions of 50 minutes

9.2 Set Up the Books: Rockefeller's Ledger A

2 sessions of 50 minutes

9.3 Run It for a Month: Lydia, a Seller of Purple

2 sessions of 50 minutes, plus your business days through the month

9.4 Close the Month: Statements, Lessons and Giving

2 sessions of 50 minutes

UNIT 9 REVIEW

This review is about your own business. Answer each question with your real numbers, showing your formulas and units. The review is worth 100 points.

1. **8 pts**

Describe your business in two sentences: what you sold and to whom.

2. **10 pts**

State your fixed costs, your cost per unit, your price and your break-even point, with the calculation.

3. **8 pts**

Write the opening journal entry for your start-up capital.

4. (8 pts)

Why is a loan from a parent recorded as a liability, not as owner's equity or revenue?

5. (8 pts)

Did your weekly trial balances always balance? Describe one error you found or one you could have made, and how you would find it.

6. (12 pts)

Give your income statement figures: sales, cost of supplies used, gross profit, other expenses, net income and net margin.

7. (8 pts)

Was your net income the same as the increase in your cash? Explain why or why not.

8. (12 pts)

Write your closing balance sheet and show that assets = liabilities + owner's equity.

9. (8 pts)

How did you divide your profit among give, save and spend, and why?

10. (8 pts)

Name two things you changed during the month and what happened after each change.

11. (10 pts)

Short answer: Which of the four people in this unit (Christiansen, Rockefeller, Lydia, LeTourneau) taught you the most for your own business, and why?

ANSWER KEY

1. Answers will vary. Full credit for a clear description of the product or service and the customers.
2. Answers will vary. Break-even = $\text{fixed costs} \div (\text{price} - \text{cost per unit})$, worked with the student's real numbers.
3. Debit Cash for the total; credit Owner's Capital for the owner's own money and Loan Payable for any money borrowed. Debits must equal credits.
4. Because it must be repaid. It is money owed to someone else, not the owner's own investment and not money earned from sales.
5. Answers will vary. Full credit for an honest description and a correct method (checking postings, the divisible-by-9 test, comparing cash with the box).
6. Answers will vary. Gross profit = sales – supplies used; net income = gross profit – other expenses; net margin = $\text{net income} \div \text{sales} \times 100$, all calculated correctly.
7. Answers will vary. Differences come from leftover supplies (bought with cash but not yet expensed), money owed by customers, loans received or repaid, and owner's draws.
8. Answers will vary. Owner's equity = capital put in + net income – draws; the totals must balance.
9. Answers will vary. Full credit for clear amounts and a thoughtful reason.
10. Answers will vary. Full credit for two specific changes and their results.
11. Answers will vary. Full credit for a clear connection between the person's story and the student's own experience.

PORTFOLIO PIECE: MY BUSINESS BOOK

Gather your month into one bound “business book”: your two-page plan and loan agreement, your chart of accounts, your journal and ledger, your weekly trial balances, your sales record and customer log, your four closing statements, and your report to your parent partner. Add a cover with your business name and logo and a final page titled “What I Would Do Next Time.” Present the book to your family, explaining your numbers and what you gave.

LOOK FOR	WHAT IT MEANS
Complete records	All parts are included, with numbered receipts supporting the journal entries.
Accuracy	Journal entries balance, trial balances agree, and the four statements are correct and consistent.
Honest reflection	The report and the “next time” page describe successes and mistakes truthfully and draw sensible lessons.
Stewardship and presentation	The loan was repaid, giving was planned, and the book is neat and clearly presented to the family.

9.1 WRITE THE PLAN AND FIND THE START-UP MONEY

OBJECTIVES

- Tell how Ole Kirk Christiansen started the toy business that became LEGO during hard times.
- Choose a real small business and write a two-page plan with real costs, a price, a break-even point and a sales goal.
- Decide how to raise start-up money: owner's equity, a loan from a parent, or both.
- Write and sign a simple partnership or loan agreement with a parent.

Warm-up. List five things you are good at making or doing. Beside each, write who might pay for it and roughly what they would pay. Circle the one you would most enjoy doing every week for a month.

WATCH

Biz Kid\$: Crash Course On Starting A Business (Accessible Preview)

Described and Captioned Media Program • 4:07

<https://www.youtube.com/watch?v=kB7bGNBPaCM>

WHEN TO WATCH

After the story, before you choose your business.

Note: A preview of an episode of the PBS series Biz Kid\$, posted by the Described and Captioned Media Program.

BACKUP VIDEO

Biz Kid\$: A Biz: What Is It? (Accessible Preview)

Described and Captioned Media Program • 4:08

<https://www.youtube.com/watch?v=pW62rpSbkHA>

If you want another short look at what a business is before writing your plan.

KEY TERMS

start-up capital

The money needed to begin a business, from the owner's savings, a loan or an investor.

owner's equity

The owner's share of the business: money the owner puts in plus profits kept in the business.

loan agreement

A written promise stating how much is borrowed, the interest (if any), and when and how it will be repaid.

sales goal

The number of units or dollars of sales a business aims for in a period, based on research and the break-even point.

CORE IDEAS

The story. Ole Kirk Christiansen was a carpenter in the small Danish village of Billund. In 1932, during the worldwide depression, farmers had no money for new barns and houses, and his business nearly failed. His wife had died, and he had four sons to support. So he looked for something families still bought, and began making wooden stepladders, ironing boards and toys from his scraps of wood. The toys sold best. In 1934 he named his company LEGO, from the Danish words *leg godt*, “play well.” He insisted on quality, with the motto “only the best is good enough,” and once sent his son back to the workshop when the boy proudly reported he had saved money by using only two coats of varnish instead of three. A fire destroyed the workshop in 1942, and he rebuilt. In 1949 the company began making plastic building bricks.

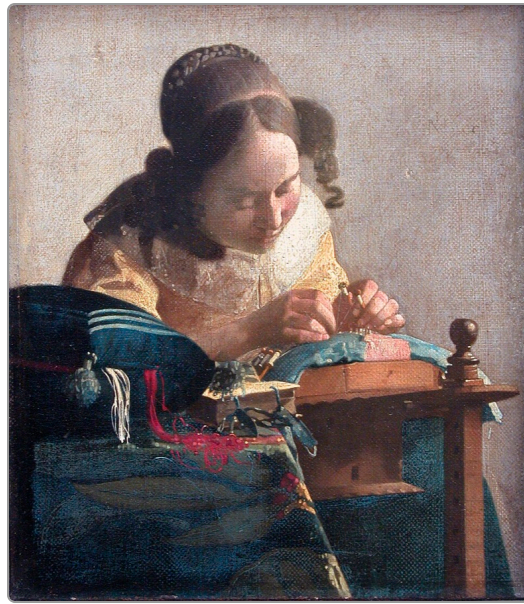
How they figured it out. Christiansen began small, used the tools and skills he already had, watched what customers actually bought, and changed course when the first plan did not work. His start-up capital was his own workshop and savings, and later loans from family members who trusted him. That is a good pattern for your business: start with what you have, keep costs low, borrow little and only from people you trust, and put everything in writing.

Try it. Your plan has two pages. Page 1: your product or service, your customers, your competition, how you will make and sell it, and what could go wrong. Page 2: the numbers. List start-up costs (fixed) and the cost per unit (variable), choose a price, and find profit per unit and the break-even point ($\text{fixed costs} \div \text{profit per unit}$). Set a sales goal for the month that is above break-even and realistic for the customers you know. Then decide how to raise your **start-up capital**: your own savings (owner’s equity), a loan from a parent (a liability you must repay), or a mix. Write a short **loan agreement**: the amount, any interest, and the date you will repay.

In business today. Every real business begins with a plan and some capital, and every lender wants to see the plan before lending. Many of the world’s great companies, like LEGO, began in a workshop or kitchen with one person’s skill and a

family's support. Planning carefully is not a lack of faith: "The thoughts of the diligent tend only to plenteousness" (Proverbs 21:5).

PICTURE STUDY



The Lacemaker, Johannes Vermeer, about 1669–1670 · Oil on canvas · Louvre, Paris

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

This is one of Vermeer's smallest paintings, only about nine by ten inches. A young woman concentrates completely on making bobbin lace, a craft that needed great skill and patience. Fine lace was a valuable product in Vermeer's Netherlands, made by hand in homes and workshops.

Look closely

- Find her hands. What is she holding, and how carefully is she working?
- Find the red and white threads spilling out of the cushion in front. How did Vermeer paint them?
- Look at her face. What does it tell you about her attention to her work?

Talk about it

1. What would a lacemaker need to know about her costs and her customers to earn a living?
2. How is this young woman like Ole Kirk Christiansen in his workshop?
3. What product could you make with the same care, and who would buy it?

Safety first. A parent supervises the whole business. Sell only to people you and your parent know, never door to door to strangers, and never online without a parent. Check your town's rules for food sales and handle food safely.

PROJECT

My Two-Page Plan and Loan Agreement

You will choose your real business with a parent, write a two-page plan with real numbers, raise your start-up money, and sign a simple agreement with your parent partner.

You will need

- Your plan and survey from Unit 6, if you did them
- Ledger notebook, calculator and a folder for the month's receipts
- A parent as partner, supervisor and banker

Steps

1. With a parent, choose your business. Check together any town rules for selling food or running a stand, and decide where and to whom you will sell (people you know only).
2. Page 1: write a paragraph each on your product, customers, competition, operations and risks.
3. Page 2: list every start-up cost with real prices, the cost per unit, your price, profit per unit and break-even point.
4. Set a sales goal for the month and a schedule (for example, two baking days a week, or four Saturday yard jobs).
5. Decide how much start-up capital you need and where it will come from. Write a loan agreement if you borrow from a parent: amount, interest (if any), repayment date, and both signatures.
6. Present the plan to your parent "banker," answer questions, and revise once.
7. Open your receipt folder and write today's date on the first page of your ledger notebook: "Business begins."

Tips

- Choose a business you can run in a few hours a week. A small business done well teaches more than a big one done in a rush.
- Borrow as little as possible. Every dollar borrowed must be repaid from profit.

Check your work

- ☐ My plan has both pages, with real costs, a price, a break-even point and a sales goal.
- ☐ I know how much start-up capital I need and where it comes from.
- ☐ My parent and I signed a written agreement.

LEDGER NOTEBOOK

1. Draw a simple logo and sign for your business.
2. Copy your break-even calculation in a box.
3. Make a calendar for the month showing your work days and your sales goal for each week.
4. Write the LEGO motto, “only the best is good enough,” and one way you will live it in your business.

From history. Ole Kirk Christiansen’s son Godtfred later turned the plastic bricks into a whole “system of play,” in which every brick fits every other. The bricks made in 1958 still fit the bricks made today, a promise of quality that customers have trusted for generations.

COMMON MISTAKES

- Choosing a business too large for the time you have. Start small.
- Guessing at costs. Price every supply before you begin.
- Borrowing without a written agreement. Write it down, even with family.

Make it a game • Loan Officer Interview. Your parent is a loan officer and asks you six questions about your business: customers, price, start-up costs, break-even point, sales goal and how you will repay. You answer from your two-page plan. Each good answer wins a point. Get at least five to sign the loan agreement. Tell how LEGO began in hard times.

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 written plan is the careful thought of the diligent. Taking time to plan before you buy supplies protects you from the want that follows haste.

9.2 SET UP THE BOOKS: ROCKEFELLER'S LEDGER A

OBJECTIVES

- Tell how John D. Rockefeller kept his first personal ledger at sixteen.
- Set up a chart of accounts for your business.
- Record the opening entries for start-up capital and first purchases.
- Set up a receipt system, a sales record and a cash box that can be checked against the books.

Warm-up. Write down, from memory, everything you spent money on last week and how much. Then check with a parent or your wallet. How close were you? What does that tell you about memory and records?

WATCH

Biz Kid\$: What's In The Books? (Accessible Preview)

Described and Captioned Media Program • 4:06

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

WHEN TO WATCH

After the story, before you set up your books.

BACKUP VIDEO

BOOKKEEPING BASICS: 7 Steps to Get You Started

Accounting Stuff • 9:16

<https://www.youtube.com/watch?v=a3GqDalw8pA>

For a fuller explanation of how a real small business sets up its books.

KEY TERMS

chart of accounts

The list of all the accounts a business uses, grouped as assets, liabilities, owner's equity, revenue and expenses.

opening entry

The first journal entry, recording the money and other things the owner or lenders put into the business.

source document

A receipt, sales slip or other paper that proves a transaction happened and shows its amount.

inventory

Goods and supplies on hand, waiting to be used or sold.

CORE IDEAS

The story. On September 26, 1855, sixteen-year-old John D. Rockefeller got his first job as an assistant bookkeeper for a produce firm in Cleveland, Ohio. All his life he celebrated that date as “job day.” He also bought a small red notebook, which he called Ledger A, and in it he recorded every cent he earned and every cent he spent: his clothing, his laundry, his board, and his gifts to his church and to the poor, which he gave from his very first wages. Rockefeller later built Standard Oil, which you studied in Grade 5, with both great efficiency and unfair dealing; but the habit of exact records that he learned as a boy stayed with him, and he kept Ledger A all his life.

How they figured it out. A good bookkeeper sets up the books before the first sale. He lists a **chart of accounts**, so that every transaction has a place. He keeps a **source document**, a receipt or sales slip, for every entry, so that anyone can check it. And he keeps the business’s money separate from his own, in its own cash box or envelope, so that the books and the cash can be compared.

Try it. A simple chart of accounts for a small business: *Assets*: Cash, Supplies (inventory), Equipment. *Liabilities*: Loan Payable (to a parent). *Owner’s Equity*: Owner’s Capital. *Revenue*: Sales. *Expenses*: Supplies Used, Other Expenses (such as a booth fee or advertising). Your **opening entry** records your start-up money. Example: you put in \$30 of your savings and borrow \$20 from a parent. Debit Cash \$50; credit Owner’s Capital \$30; credit Loan Payable \$20. Then you buy \$35 of baking supplies: debit Supplies \$35, credit Cash \$35. Assets (\$15 cash + \$35 supplies = \$50) equal liabilities (\$20) plus owner’s equity (\$30).

In business today. Every business, however small, must keep records good enough to show its owners, its lenders and the government what it earned. Careful records also protect an honest owner from mistakes and from being cheated. Jesus said that whoever is faithful in a little is faithful in much (Luke 16:10). A small red notebook, kept faithfully, is where that faithfulness begins.

PICTURE STUDY



A Woman Weighing Gold, Pieter de Hooch, about 1664 · Oil on canvas · Gemäldegalerie, Berlin

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

Pieter de Hooch painted calm Dutch homes and courtyards, full of light. Here a woman carefully weighs gold coins on a small balance at her table. In the Netherlands of the 1600s, coins from many countries passed through people's hands, and careful households checked their weight and recorded their value.

Look closely

- Find the balance and the coins. What is she checking?
- Find the chest or box. What might be kept in it?
- Look at the light and the tidy room. What mood does the painter create?

Talk about it

1. Why would a household or a business check its coins instead of just counting them?
2. How is her careful weighing like keeping a ledger?
3. What would you keep in your business's cash box, and how would you check it?

PROJECT

Open the Books

You will set up the complete books for your business: a chart of accounts, a journal with your opening entries, ledger pages, a receipt folder, a sales record and a counted cash box.

You will need

- Ledger notebook or a free spreadsheet
- A folder or envelope for receipts
- A cash box or envelope used only for the business
- Your plan and loan agreement from Lesson 9.1

Steps

1. Write your chart of accounts on the first page, grouped as assets, liabilities, owner's equity, revenue and expenses.
2. Set up a journal page (Date, Account, Debit, Credit, Explanation) and a ledger page (T-account) for each account.
3. Record your opening entry for your start-up capital, with the loan agreement as its source document.
4. Buy your first supplies with a parent. Keep every receipt, number it, and record each purchase in the journal.
5. Post the entries to the ledger and find each balance.
6. Count the cash in your cash box and check that it equals your Cash account balance.
7. Set up a sales record page for the month: Date, Customer (first name only), Item, Quantity, Price, Total, Paid (yes or no).
8. Check that $\text{assets} = \text{liabilities} + \text{owner's equity}$ and write the equation with your numbers.

Tips

- Keep the business's money separate from your allowance and savings. Mixed money makes honest books impossible.

- Number each receipt and write the number in the journal's explanation column, so every entry can be traced.

Check your work

- ☐ I wrote a chart of accounts and recorded my opening entry.
- ☐ Every purchase has a numbered receipt and a balanced journal entry.
- ☐ My cash box matches my Cash account.

LEDGER NOTEBOOK

1. Copy your chart of accounts neatly and color-code the five groups.
2. Draw your cash box and receipt folder and label how you will keep them safe.
3. Write the accounting equation with your opening numbers.
4. Write one sentence about why Rockefeller kept Ledger A all his life.

From history. Rockefeller's Ledger A survives and shows that, from his first months of work, he gave a part of his small wages to his Baptist church, to missions and to the poor. Later in life he and his family gave hundreds of millions of dollars to universities, medical research and public health.

COMMON MISTAKES

- Recording a loan from a parent as owner's equity. A loan is a liability that must be repaid.
- Losing receipts. A transaction without a receipt is hard to check.
- Mixing business money with personal money.

Make it a game • Chart It in Two. Set a two-minute timer. On paper, list the chart of accounts for your pretend business: assets, liabilities, owner's equity, revenue and expenses, ten accounts in all. Then your parent calls a transaction and you name the two accounts it touches. Beat your count. Tell about Rockefeller's Ledger A at sixteen.

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)

Keeping exact records of a few dollars is faithfulness in that which is least. The habits you form with a small business shape how you will handle much larger ones.

9.3 RUN IT FOR A MONTH: LYDIA, A SELLER OF PURPLE

OBJECTIVES

- Tell what Scripture says about Lydia, a businesswoman of the first century.
- Sell honestly and serve customers well, with clear prices and fair dealing.
- Record every sale and expense through the month, and take a weekly trial balance.
- Count inventory and adjust the plan as you learn.

Warm-up. Think of a time you were a customer and were treated very well, or very badly. Write what the seller did. Then write three rules you will follow with your own customers.

WATCH

Biz Kid\$: Sell, Sell (The Science Of Sales) (Accessible Preview)

Described and Captioned Media Program • 4:08

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

WHEN TO WATCH

Before your first selling day.

BACKUP VIDEO

Biz Kid\$: Learning From Failure (Accessible Preview)

Described and Captioned Media Program • 4:05

<https://www.youtube.com/watch?v=a2IEI5vOhiE>

In the middle of the month, if sales are slower than you hoped.

KEY TERMS

customer service

Everything a business does to help, respect and satisfy its customers before, during and after a sale.

inventory count

Counting the goods and supplies actually on hand to check them against the records.

weekly trial balance

A trial balance taken at the end of each week to catch errors while they are still easy to find.

accounts receivable

Money customers owe for goods or services already delivered.

CORE IDEAS

The story. When the apostle Paul first preached in Europe, at Philippi in Macedonia, one of the first people to believe was a businesswoman named Lydia. Acts 16:14 calls her “a seller of purple, of the city of Thyatira.” Thyatira, in what is now western Turkey, was known for its dyers, and purple cloth was one of the most valuable goods of the ancient world, worn by the wealthy and by rulers. Lydia had moved her trade to Philippi, a Roman colony on a great road, where she would find customers. She was the head of her household, she had a house large enough to welcome Paul and his companions, and after she was baptized she urged them to stay with her.

How they figured it out. We know little about how Lydia ran her trade, but the clues are instructive: she sold a costly product to customers who could afford it, she chose a busy city on a trade route, and she used what God gave her to serve others. Her house became a meeting place for the first church in Philippi (Acts 16:40). A business, rightly run, can serve customers, support a household and open its doors to others.

Try it. This month, run your business. On every selling day: post a clear price, greet customers warmly, describe the product truthfully, make change carefully and thank them. Record every sale in your sales record and journal, and put every dollar in the cash box. If a customer will pay later, record it as **accounts receivable**, not cash. At the end of each week: take a **weekly trial balance**, count your cash and check it against the Cash account, and do an **inventory count** of your supplies and finished goods. Compare your sales with your weekly goal, and change one thing that could work better.

In business today. Good businesses check their books often, not just at the end of the year, so that small mistakes do not become large ones. They listen to customers, keep their promises and fix problems quickly. Every honest sale is a small act of service: the customer gets something he values, and you earn a fair reward for your work.

PICTURE STUDY



Lydia, Seller of Purple, Engraving from the series *Famous Women of the New Testament*, 17th century ·

Engraving · Rijksmuseum, Amsterdam

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

This print comes from a series of engravings of famous women of the New Testament, made in the Netherlands for Bible readers. The Latin title calls her *Lydia Purpuraria*: Lydia, the dealer in purple.

Look closely

- Find what she is carrying. What might a merchant keep in a purse?
- Look at the scene behind her: people gathered by a river. Read Acts 16:13-15. What event might it show?
- Find the Latin caption. Which word means “purple-seller”?

Talk about it

1. Why would a seller of costly purple cloth move to a busy Roman city like Philippi?
2. How did Lydia use her business and her house to serve others?
3. What can you learn from Lydia for your own month of business?

Safety first. A parent is present for all selling and keeps the cash box nearby. Sell only to people you know, never door to door to strangers, and never share personal information. Follow food-safety rules and your town's rules for kids' stands and food sales.

PROJECT

A Month of Trading

You will run your business for four weeks with a parent, keeping every record, taking a trial balance each week and adjusting your plan as you learn.

You will need

- Your business supplies, signs, price tags and cash box
- Your journal, ledger, sales record and receipt folder
- A calculator and a parent as partner and supervisor

Steps

1. Before the first selling day, practice with a parent: greet, describe, take payment, make change and thank. Practice making change for \$5 and \$10 bills.
2. On each selling day, record every sale in the sales record and every purchase with its receipt.
3. At the end of each day, count the cash and record the day's journal entries (debit Cash, credit Sales; debit Supplies or Expenses, credit Cash).
4. At the end of each week, post to the ledger, take a trial balance and count your inventory. Fix any error you find, and write down what it was.
5. Each week, compare your sales with your goal in a small table: Week, Goal, Actual, Difference.
6. Each week, change one thing based on what you learned (a price, a product, the time you sell, the sign), and write why.
7. Keep a short customer log: one sentence about something a customer said or asked.
8. At the end of the month, gather all your records in one folder for closing the books in Lesson 9.4.

Tips

- If the cash box does not match the books, do not “fix” it with a made-up entry. Find the reason, or record the difference honestly as a cash shortage or overage.

- Slow weeks happen. Learn from them, as the backup video explains, instead of giving up.

Check your work

- ☐ I recorded every sale and expense with a source document.
- ☐ I took a trial balance and counted cash and inventory each week.
- ☐ I made at least three improvements during the month and wrote why.

LEDGER NOTEBOOK

1. Make a bar graph of weekly sales against your weekly goal.
2. Copy one weekly trial balance neatly.
3. Write your three customer-service rules and how well you kept each.
4. Write the verse Acts 16:14 and one sentence about what Lydia's example means to you.

From history. Purple dye in the ancient world was made from sea snails or from plant roots, and it took enormous labor to produce, which is why purple cloth was so costly. Inscriptions found at Thyatira mention a guild of dyers there, which fits Luke's description of Lydia's trade.

COMMON MISTAKES

- Waiting until the end of the month to record sales. Record each day while you remember.
- Counting a promise to pay as cash. It is accounts receivable until the money arrives.
- Changing too many things at once. Change one thing each week so you can tell what helped.

Make it a game · Lydia's Shop Day. Your parent is a customer with surprising requests: a discount you cannot give, buying on credit, a price that is unclear. You answer honestly and write each sale on a sheet. At the end, count your inventory and name accounts receivable. Say what Scripture teaches about Lydia, a seller of purple.

Scripture. “And a certain woman named Lydia, a seller of purple, of the city of Thyatira, which worshipped God, heard us: whose heart the Lord opened, that she attended unto the things which were spoken of Paul.” (Acts 16:14, KJV)

Lydia was a businesswoman whose heart was open to God, and her business and home became a place of welcome. Work and faith belong together.

9.4 CLOSE THE MONTH: STATEMENTS, LESSONS AND GIVING

OBJECTIVES

- Tell how R. G. LeTourneau, a builder of earth-moving machines, came to give away most of his income.
- Prepare a final trial balance, an income statement, a cash-flow summary and a balance sheet for your month.
- Repay any loan, decide what to give and what to keep, and record those entries.
- Write an honest report of what went well, what did not and what you would change.

Warm-up. Before you add anything up, guess: How much did your business sell this month? How much profit did it make? How much cash is in the box? Write your guesses and seal them in an envelope to open at the end of the lesson.

WATCH

FINANCIAL STATEMENTS: all the basics in 8 MINS!

Accounting Stuff • 9:05

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

WHEN TO WATCH

Before you prepare your statements. Pause after each statement and name the one you will make.

KEY TERMS

closing the books

Finishing a period's records: checking every account, preparing the statements and starting fresh for the next period.

balance sheet

A statement of what a business owns (assets), owes (liabilities) and the owner's share (owner's equity) on one date.

owner's draw

Money the owner takes out of the business for personal use or giving; it lowers owner's equity and is not an expense.

retained profit

Profit kept in the business to buy supplies or grow, instead of being taken out by the owner.

CORE IDEAS

The story. Robert Gilmour LeTourneau was born in 1888 and left school early. He worked as an iron molder, a mechanic and a builder, and went deep into debt when a business failed. He was a devout Christian, and after his debts were paid he decided to make God his partner in business. He designed huge earth-moving machines, scrapers, bulldozers and later giant wheeled loaders, and his company grew large. As it grew, he and his wife Evelyn increased their giving until they were giving about ninety percent of their income and living on ten. They used it to support missions, a Christian college now called LeTourneau University, and work in Africa and South America. He liked to say that the question is not how much of our money we give to God, but how much of God's money we keep for ourselves.

How they figured it out. LeTourneau did not give carelessly; his gifts came from a business that was run carefully and earned real profits. Generosity needs honest books: you must know what you truly earned before you can give from it wisely. That is why closing the books comes before deciding what to give.

Try it. To close your month: (1) Post every entry and take a final trial balance. (2) Prepare the income statement: Sales – cost of supplies used = gross profit; – other expenses = net income. (3) Prepare a cash summary: starting cash + cash from customers – cash paid out = ending cash; check it against the box. (4) Repay any loan from a parent: debit Loan Payable, credit Cash. (5) Decide your give, save and spend amounts from your profit; recording money taken out as an **owner's draw** (debit Owner's Draw, credit Cash). (6) Prepare a **balance sheet**: assets = liabilities + owner's equity, where owner's equity = capital put in + net income – draws. Example: capital \$30, net income \$46, draw \$20: owner's equity = \$56. If cash is \$41 and leftover supplies are \$15, assets = \$56, with no liabilities after the loan is repaid. It balances.

In business today. Every business closes its books at the end of each month and year. Owners who read their statements honestly learn what to keep doing and what to change. And many Christian business owners, like LeTourneau, the Cadburys and

Hershey, have shown that profit honestly earned can be given generously. “Charge them that are rich in this world ... That they do good, that they be rich in good works, ready to distribute, willing to communicate” (1 Timothy 6:17-18).

PICTURE STUDY



The Parable of the Rich Fool, Rembrandt van Rijn, 1627 · Oil on oak panel · Gemäldegalerie, Berlin

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

Rembrandt painted this when he was only about twenty-one. An old man examines a coin by candlelight among piles of account books and papers. It is often linked with Jesus’ parable of the rich man who built bigger barns for his goods and said, “Soul, thou hast much goods laid up,” but God said, “Thou fool, this night thy soul shall be required of thee” (Luke 12:19-20).

Look closely

- Find the candle. What does it light up, and what stays in darkness?
- Look at the books and papers. What kind of records might they be?
- Look at the old man’s face. What does he care about most?

Talk about it

1. Keeping good books is wise. What turns this man’s careful counting into foolishness?
2. How is this man different from R. G. LeTourneau?
3. When you close your books, what will you do with the profit, and why?

PROJECT

Close the Books and Report

You will close the books for your month of business, prepare four statements, repay what you owe, decide what to give, and write an honest report to your parent partner.

You will need

- All your records from the month
- Ledger notebook or spreadsheet and a calculator
- Give, Save and Spend jars

Steps

1. Post any remaining entries and take a final trial balance. Fix any errors.
2. Count your remaining supplies and finished goods. $\text{Supplies used} = \text{supplies bought} - \text{supplies left}$. Record supplies used as an expense.
3. Prepare the income statement for the month, with gross profit, net income and net margin.
4. Prepare the cash summary and check it against the cash box. Explain any difference.
5. Repay your parent's loan with interest, if any, and record the entry.
6. Decide how much of your profit to give, save and spend, record the owner's draw, and put the money in the three jars.
7. Prepare the balance sheet and check that $\text{assets} = \text{liabilities} + \text{owner's equity}$.
8. Open the sealed envelope with your warm-up guesses and compare them with the real numbers.
9. Write a one-page report to your parent partner: the numbers, what went well, what did not, what you would change, and what you gave and why.

Tips

- If your business lost money, your statements are still a success if they are honest. Many great businesses began with a loss and a lesson.

- Set aside the Give portion first, as LeTourneau did, before deciding what to spend.

Check your work

- ☐ I prepared a trial balance, an income statement, a cash summary and a balance sheet that agree with each other.
- ☐ I repaid what I owed and recorded it.
- ☐ I wrote an honest report and decided what to give.

LEDGER NOTEBOOK

1. Copy your four statements neatly on facing pages, with headings and dates.
2. Draw a pie chart of how you divided your profit among give, save and spend.
3. Write three lessons from your month that you would teach a younger brother or sister starting a business.
4. Write 2 Corinthians 9:7 and one sentence about how you gave this month.

From history. R. G. LeTourneau's machines helped build roads, airfields and dams around the world, and he held around three hundred patents. He traveled widely, often flying in his own plane, to speak to business groups and churches about working with God as a partner, and he kept giving until his death in 1969.

COMMON MISTAKES

- Counting all supplies bought as an expense even if some are left. Leftover supplies are still an asset.
- Treating the owner's draw as an expense. It lowers owner's equity but does not reduce profit.
- Forgetting to repay the loan before deciding what is yours to keep.

Make it a game • Month-End Sprint. Race the clock. Prepare a final trial balance, then an income statement, then a cash-flow summary and a balance sheet from your month's records, checking totals. Your parent times each step. Then tell how R. G. LeTourneau chose to give away most of his income, and decide what share you will give.

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)

Giving is the happy end of honest work. After the books are closed and the debts are paid, a cheerful gift from real profit honors God and helps others.

BONUS: RUN A REAL BUSINESS

This optional bonus unit puts the whole year to work. With a parent as your partner and supervisor, you will run a small real business for one month: write a plan, raise a little start-up money, set up a full set of double-entry books, sell honestly, record every transaction, and close the month with a trial balance, an income statement, a cash-flow summary and a balance sheet. Good choices for a sixth grader include baked goods for neighbors and church friends you know, greeting cards, bookmarks, seedlings, pet sitting, yard help or a simple repair service.

Each lesson pairs your work with a real person who did it well: Ole Kirk Christiansen, the Danish carpenter who began LEGO in hard times; John D. Rockefeller, who kept his first personal ledger at sixteen; Lydia of Thyatira, “a seller of purple”; and R. G. LeTourneau, the machine builder who gave away most of his income. Do this unit after the family market day, over the summer, or alongside the year.

PREREQUISITES

- Has completed Units 6 and 7, or knows business plans, journals, ledgers and the income statement
- Can calculate profit, percents and break-even
- Has a parent willing to supervise and act as partner and banker

MASTERY CHECKLIST

- ☐ I can write a business plan with start-up costs, a price, a break-even point and a sales goal.
- ☐ I can set up a chart of accounts and record the start-up money as owner’s equity or a loan.
- ☐ I can keep a journal, ledger and weekly trial balance for a month of real business.
- ☐ I can prepare an income statement, a cash-flow summary and a balance sheet at the end of the month.
- ☐ I can repay what I owe, decide what to give, and explain what I learned.

OPTIONAL BOOKS AND GAMES FOR THIS UNIT

- **Biz Kid\$ (PBS):** Free episodes and resources about young people who started real businesses. Good to watch with a parent while choosing a business in Lesson 9.1.
- **LibreOffice Calc (free spreadsheet):** Free software for keeping your journal, ledger and statements with formulas. A parent installs it. Google Sheets works too, and paper 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

9.1 Write the Plan and Find the Start-up Money

2 sessions of 50 minutes

9.2 Set Up the Books: Rockefeller's Ledger A

2 sessions of 50 minutes

9.3 Run It for a Month: Lydia, a Seller of Purple

2 sessions of 50 minutes, plus your business days through the month

9.4 Close the Month: Statements, Lessons and Giving

2 sessions of 50 minutes

UNIT 9 REVIEW

This review is about your own business. Answer each question with your real numbers, showing your formulas and units. The review is worth 100 points.

1. **8 pts**

Describe your business in two sentences: what you sold and to whom.

2. **10 pts**

State your fixed costs, your cost per unit, your price and your break-even point, with the calculation.

3. **8 pts**

Write the opening journal entry for your start-up capital.

4. **8 pts**

Why is a loan from a parent recorded as a liability, not as owner's equity or revenue?

5. **8 pts**

Did your weekly trial balances always balance? Describe one error you found or one you could have made, and how you would find it.

6. **12 pts**

Give your income statement figures: sales, cost of supplies used, gross profit, other expenses, net income and net margin.

7. **8 pts**

Was your net income the same as the increase in your cash? Explain why or why not.

8. **12 pts**

Write your closing balance sheet and show that assets = liabilities + owner's equity.

9. **8 pts**

How did you divide your profit among give, save and spend, and why?

10. **8 pts**

Name two things you changed during the month and what happened after each change.

11. **10 pts**

Short answer: Which of the four people in this unit (Christiansen, Rockefeller, Lydia, LeTourneau) taught you the most for your own business, and why?

ANSWER KEY

1. Answers will vary. Full credit for a clear description of the product or service and the customers.
2. Answers will vary. Break-even = $\text{fixed costs} \div (\text{price} - \text{cost per unit})$, worked with the student's real numbers.
3. Debit Cash for the total; credit Owner's Capital for the owner's own money and Loan Payable for any money borrowed. Debits must equal credits.
4. Because it must be repaid. It is money owed to someone else, not the owner's own investment and not money earned from sales.
5. Answers will vary. Full credit for an honest description and a correct method (checking postings, the divisible-by-9 test, comparing cash with the box).
6. Answers will vary. Gross profit = sales – supplies used; net income = gross profit – other expenses; net margin = $\text{net income} \div \text{sales} \times 100$, all calculated correctly.
7. Answers will vary. Differences come from leftover supplies (bought with cash but not yet expensed), money owed by customers, loans received or repaid, and owner's draws.
8. Answers will vary. Owner's equity = capital put in + net income – draws; the totals must balance.
9. Answers will vary. Full credit for clear amounts and a thoughtful reason.
10. Answers will vary. Full credit for two specific changes and their results.
11. Answers will vary. Full credit for a clear connection between the person's story and the student's own experience.

PORTFOLIO PIECE: MY BUSINESS BOOK

Gather your month into one bound “business book”: your two-page plan and loan agreement, your chart of accounts, your journal and ledger, your weekly trial balances, your sales record and customer log, your four closing statements, and your report to your parent partner. Add a cover with your business name and logo and a final page titled “What I Would Do Next Time.” Present the book to your family, explaining your numbers and what you gave.

LOOK FOR	WHAT IT MEANS
Complete records	All parts are included, with numbered receipts supporting the journal entries.
Accuracy	Journal entries balance, trial balances agree, and the four statements are correct and consistent.
Honest reflection	The report and the “next time” page describe successes and mistakes truthfully and draw sensible lessons.
Stewardship and presentation	The loan was repaid, giving was planned, and the book is neat and clearly presented to the family.