

GRADE 6 ART

First edition

8 units

32 lessons

A video for every lesson

FIRST EDITION

COURSE GUIDE

Grade 6 is the year a student moves from “drawing what I know” to “drawing what I see.” Over 32 weeks the course works through the same strands every School Launch art year returns to (line, shape and form, color, value and light, materials, space, composition, and the masters), but now with real art vocabulary and the reasons behind each technique. Students learn to measure with a pencil, build a face in correct proportion, mix color by hue, value and chroma, model form in graphite and charcoal, draw buildings in two- and three-point perspective, and design a picture with the rule of thirds, leading lines and notan.

Every lesson follows the same three movements: **look, learn, make**. The student first looks carefully at a great work of art, usually from the Western and Christian tradition (Vermeer, Rembrandt, Caravaggio, Dürer, Leonardo, Constable, Hiroshige, the Byzantine icon painters and the monks of Kells). Then he or she learns one clear idea from short teaching paragraphs and a video. Finally the student makes something that uses that idea, in a studio project and in a sketchbook exercise.

One unit is given to *material science*: what graphite, charcoal, paper, erasers and fixative actually are, how they are made, and why they behave as they do. The year closes with a tour of art from ancient Egypt through Byzantium to the Gothic cathedrals and the Book of Kells, so that the student sees the long story of which his or her own work is a small part. The site motto, *Fabricando fit faber* (“by making, one becomes a maker”), is the spirit of the whole course.

Each lesson links one main video and often a backup. Most come from teaching channels such as Circle Line Art School, The Virtual Instructor, Lazy Arts, Draw Mix Paint, Smarthistory and The National Gallery, London. Videos were chosen for clear, wholesome teaching, but they are made by independent artists: some end with a request to subscribe or an ad for the artist’s own course or paint brand, and a few use oil paint or digital tools where your student will use pencil, charcoal or acrylic. The ideas carry over. Please preview any video

you are unsure about, and use the backup if one does not suit your family. Every video, including every artwork that appears on screen, was checked frame by frame for wholesome content: nothing immodest, nothing violent and nothing divisive.

Start with Lesson 1.1 →

WHO IT IS FOR

Students about 11 to 12 years old (sixth grade) who can read independently and hold a pencil with control. No earlier art training is required, though students who have done the earlier School Launch art years will recognize the strands. A parent or teacher does not need any art background: every lesson explains what to teach, what to look for, and what good work looks like.

HOW TO USE THIS COURSE

1. **Weekly rhythm.** One lesson a week in two sessions of about 50 minutes, for 32 weeks. Session 1: warm-up, core ideas, video and picture study. Session 2: the studio project and the sketchbook exercise. In the last week of each unit add a third session for the unit review and the portfolio piece.
2. **Reading the lesson.** Sixth graders can read the core ideas on their own, but read them together the first few weeks and talk about the key terms. Ask the student to explain each idea back to you in his or her own words before the video.
3. **Picture study.** Show the picture large (on a screen or printed). The student looks in silence for two full minutes, then the picture is put away and the student tells back everything he or she noticed, in order. Then look again together using the “look” prompts, and talk through the questions. Do not rush this; careful looking is the root of good drawing.
4. **Videos.** Watch at the point the lesson suggests. For how-to videos, pause after each step and let the student draw along. A backup video is listed for many lessons.
5. **Sketchbook habit.** Keep one sketchbook for the whole year. Date every page. Besides the weekly sketchbook exercises, aim for 10–15 minutes of drawing from life three or four other days a week. The sketchbook is a practice field, not a gallery: mistakes stay in.

6. **Unit review and portfolio.** At the end of each unit the student answers the review questions (mostly orally or in a few written lines) and makes one finished portfolio piece using the unit's skills. Keep the portfolio pieces flat in a large folder; they become the family art show in the last week.
7. **Materials and safety.** Charcoal and pastel dust should be tapped into a trash can, never blown. Spray fixative is used only by an adult, outdoors. Craft knives appear only as an option with an adult. Keep a damp rag nearby for hands.

SCOPE AND SEQUENCE

UNIT 1 • WEEKS 1–4

The Elements and Principles of Art

The seven elements of art and the principles of design, the habit of a sketchbook, and a four-step way to talk about any artwork: describe, analyze, interpret, judge.

- 1.1 The Seven Elements of Art
- 1.2 The Principles of Design
- 1.3 The Sketchbook Habit
- 1.4 Art Criticism: Describe, Analyze, Interpret, Judge

UNIT 3 • WEEKS 9–12

Color: Hue, Value and Chroma

Munsell's three dimensions of color (hue, value and chroma), painting with a limited palette, color harmonies, and how color shows air, distance and time of day.

- 3.1 Munsell's Three Dimensions of Color
- 3.2 The Limited Palette
- 3.3 Color Harmony
- 3.4 Color and Atmosphere

UNIT 2 • WEEKS 5–8

Drawing Proportion and Portraits

Sighting and measuring with a pencil, the proportions of the human face, drawing eyes, noses, mouths and ears, and a finished self-portrait from a mirror.

- 2.1 Sighting and Measuring
- 2.2 Proportions of the Face
- 2.3 Drawing the Features
- 2.4 A Self-Portrait from a Mirror

UNIT 4 • WEEKS 13–16

Light: Chiaroscuro

Modeling form in graphite and in charcoal, chiaroscuro and tenebrism in Caravaggio and Rembrandt, and drawing a still life lit by one strong light.

- 4.1 Rendering Form in Graphite
- 4.2 Drawing in Charcoal: Massing Light and Dark
- 4.3 Chiaroscuro and Tenebrism
- 4.4 Drawing by Candlelight-Like Light

UNIT 5 • WEEKS 17–20

Material Science: Drawing Media

Material science of drawing: how pencils are made and what H and B mean, vine and compressed charcoal, paper fibers, sizing and tooth, and erasers, blending tools and fixative safety.

- 5.1 Graphite: How Pencils Are Made
- 5.2 Charcoal: Vine and Compressed
- 5.3 Paper: Fiber, Sizing and Tooth
- 5.4 Erasers, Blending Tools and Fixative

UNIT 7 • WEEKS 25–28

Composition

Designing a picture: the rule of thirds, the golden ratio, leading lines that guide the eye, and notan light-dark design.

- 7.1 The Rule of Thirds
- 7.2 The Golden Ratio
- 7.3 Leading Lines
- 7.4 Notan: Designing in Light and Dark

UNIT 6 • WEEKS 21–24

Perspective

Two-point perspective, an introduction to three-point perspective, atmospheric perspective, and a finished street scene.

- 6.1 Two-Point Perspective
- 6.2 Three-Point Perspective
- 6.3 Atmospheric Perspective
- 6.4 Drawing a Street

UNIT 8 • WEEKS 29–32

Art from Ancient to Medieval

Art from ancient Egypt to the Middle Ages: Egyptian tomb painting, Byzantine mosaics and icons, Romanesque and Gothic churches and stained glass, and the illuminated Book of Kells.

- 8.1 Egyptian Art
- 8.2 Byzantine Mosaics and Icons
- 8.3 Romanesque and Gothic: Churches of Stone and Light
- 8.4 The Book of Kells and Illumination

WEEKLY PACING CALENDAR

WEEK	PLAN
1	• Session 1: Lesson 1.1 The Seven Elements of Art: warm-up, video, teaching and picture study • Session 2: Lesson 1.1 studio project and sketchbook practice <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>

WEEK	PLAN
2	• Session 1: Lesson 1.2 The Principles of Design: warm-up, video, teaching and picture study • Session 2: Lesson 1.2 studio project and sketchbook practice
3	• Session 1: Lesson 1.3 The Sketchbook Habit: warm-up, video, teaching and picture study • Session 2: Lesson 1.3 studio project and sketchbook practice
4	• Session 1: Lesson 1.4 Art Criticism: Describe, Analyze, Interpret, Judge: warm-up, video, teaching and picture study • Session 2: Lesson 1.4 studio project and sketchbook practice • Session 3: Unit 1 review and portfolio piece
5	• Session 1: Lesson 2.1 Sighting and Measuring: warm-up, video, teaching and picture study • Session 2: Lesson 2.1 studio project and sketchbook practice
6	• Session 1: Lesson 2.2 Proportions of the Face: warm-up, video, teaching and picture study • Session 2: Lesson 2.2 studio project and sketchbook practice
7	• Session 1: Lesson 2.3 Drawing the Features: warm-up, video, teaching and picture study • Session 2: Lesson 2.3 studio project and sketchbook practice
8	• Session 1: Lesson 2.4 A Self-Portrait from a Mirror: warm-up, video, teaching and picture study • Session 2: Lesson 2.4 studio project and sketchbook practice • Session 3: Unit 2 review and portfolio piece
9	• Session 1: Lesson 3.1 Munsell's Three Dimensions of Color: warm-up, video, teaching and picture study • Session 2: Lesson 3.1 studio project and sketchbook practice
10	• Session 1: Lesson 3.2 The Limited Palette: warm-up, video, teaching and picture study • Session 2: Lesson 3.2 studio project and sketchbook practice
11	• Session 1: Lesson 3.3 Color Harmony: warm-up, video, teaching and picture study • Session 2: Lesson 3.3 studio project and sketchbook practice

WEEK	PLAN
12	• Session 1: Lesson 3.4 Color and Atmosphere: warm-up, video, teaching and picture study • Session 2: Lesson 3.4 studio project and sketchbook practice • Session 3: Unit 3 review and portfolio piece
13	• Session 1: Lesson 4.1 Rendering Form in Graphite: warm-up, video, teaching and picture study • Session 2: Lesson 4.1 studio project and sketchbook practice
14	• Session 1: Lesson 4.2 Drawing in Charcoal: Massing Light and Dark: warm-up, video, teaching and picture study • Session 2: Lesson 4.2 studio project and sketchbook practice
15	• Session 1: Lesson 4.3 Chiaroscuro and Tenebrism: warm-up, video, teaching and picture study • Session 2: Lesson 4.3 studio project and sketchbook practice
16	• Session 1: Lesson 4.4 Drawing by Candlelight-Like Light: warm-up, video, teaching and picture study • Session 2: Lesson 4.4 studio project and sketchbook practice • Session 3: Unit 4 review and portfolio piece
17	• Session 1: Lesson 5.1 Graphite: How Pencils Are Made: warm-up, video, teaching and picture study • Session 2: Lesson 5.1 studio project and sketchbook practice
18	• Session 1: Lesson 5.2 Charcoal: Vine and Compressed: warm-up, video, teaching and picture study • Session 2: Lesson 5.2 studio project and sketchbook practice
19	• Session 1: Lesson 5.3 Paper: Fiber, Sizing and Tooth: warm-up, video, teaching and picture study • Session 2: Lesson 5.3 studio project and sketchbook practice
20	• Session 1: Lesson 5.4 Erasers, Blending Tools and Fixative: warm-up, video, teaching and picture study • Session 2: Lesson 5.4 studio project and sketchbook practice • Session 3: Unit 5 review and portfolio piece

WEEK	PLAN
21	• Session 1: Lesson 6.1 Two-Point Perspective: warm-up, video, teaching and picture study • Session 2: Lesson 6.1 studio project and sketchbook practice
22	• Session 1: Lesson 6.2 Three-Point Perspective: warm-up, video, teaching and picture study • Session 2: Lesson 6.2 studio project and sketchbook practice
23	• Session 1: Lesson 6.3 Atmospheric Perspective: warm-up, video, teaching and picture study • Session 2: Lesson 6.3 studio project and sketchbook practice
24	• Session 1: Lesson 6.4 Drawing a Street: warm-up, video, teaching and picture study • Session 2: Lesson 6.4 studio project and sketchbook practice • Session 3: Unit 6 review and portfolio piece
25	• Session 1: Lesson 7.1 The Rule of Thirds: warm-up, video, teaching and picture study • Session 2: Lesson 7.1 studio project and sketchbook practice
26	• Session 1: Lesson 7.2 The Golden Ratio: warm-up, video, teaching and picture study • Session 2: Lesson 7.2 studio project and sketchbook practice
27	• Session 1: Lesson 7.3 Leading Lines: warm-up, video, teaching and picture study • Session 2: Lesson 7.3 studio project and sketchbook practice
28	• Session 1: Lesson 7.4 Notan: Designing in Light and Dark: warm-up, video, teaching and picture study • Session 2: Lesson 7.4 studio project and sketchbook practice • Session 3: Unit 7 review and portfolio piece
29	• Session 1: Lesson 8.1 Egyptian Art: warm-up, video, teaching and picture study • Session 2: Lesson 8.1 studio project and sketchbook practice
30	• Session 1: Lesson 8.2 Byzantine Mosaics and Icons: warm-up, video, teaching and picture study • Session 2: Lesson 8.2 studio project and sketchbook practice

WEEK	PLAN
31	• Session 1: Lesson 8.3 Romanesque and Gothic: Churches of Stone and Light: warm-up, video, teaching and picture study • Session 2: Lesson 8.3 studio project and sketchbook practice
32	• Session 1: Lesson 8.4 The Book of Kells and Illumination: warm-up, video, teaching and picture study • Session 2: Lesson 8.4 studio project and sketchbook practice • Session 3: Unit 8 review and portfolio piece <i>Last week. Hold a family art show: hang the best piece from each unit and let the student tell guests about one of them.</i>

MATERIALS

Sketchbook (9×12 in, mixed-media paper, 60–100 sheets)

For warm-ups and the weekly sketchbook exercises. Mixed-media paper takes pencil, charcoal, marker and light washes.

Drawing paper pad (9×12 or 11×14 in, 70–90 lb)

For studio projects and portfolio pieces.

Graphite pencils: 2H, HB, 2B, 4B, 6B

The hard pencils (H) for light guidelines, the soft ones (B) for darks. Units 1, 2, 4, 5 and 6.

Charcoal: a few sticks of vine or willow charcoal, one compressed charcoal stick, one charcoal pencil

Units 4 and 5. Inexpensive student sets are fine.

Erasers: one kneaded eraser and one white vinyl eraser

The kneaded eraser lifts charcoal and lightens graphite; the vinyl eraser cleans edges.

Blending stump (tortillon) and a soft tissue

For smoothing graphite and charcoal. Fingers leave oil on paper, so use these instead.

Ruler (12 in or 18 in) and a long straight edge

For perspective in Unit 6.

Acrylic paint, student grade: titanium white, a warm and a cool of each primary (for example cadmium yellow light, lemon yellow, cadmium red, alizarin crimson or

quinacridone magenta, ultramarine blue, phthalo blue), plus yellow ochre, burnt umber and black

Unit 3. A basic set of five tubes (white, ultramarine, lemon yellow, magenta, yellow ochre) is enough to start. Watercolor pans may be used instead.

Brushes: a ½ in flat, a #8 round, a #4 round

Synthetic brushes for acrylic. Wash them in soap and water before the paint dries.

Palette (a white plate or palette paper), a water jar, paper towels, a spray bottle of water

The spray bottle keeps acrylics wet on the palette.

Watercolor paper (a few sheets, 140 lb cold press) and mixed-media paper

For Unit 3 painting and the Unit 5 paper tests.

Black and white construction paper or cardstock, glue stick, scissors

Unit 7 notan designs and Unit 8 mosaic.

Colored pencils and a fine black pen

Unit 8 illumination.

Gold or yellow metallic marker or paint (optional)

For gilding in icons and illuminated letters.

A hand mirror or a mirror you can prop up

Unit 2 self-portrait.

A desk lamp with a bare bulb or clip light

Unit 4 light and shadow. A single strong light is the key tool of the unit.

Workable fixative spray (optional, adult use only)

Unit 5. Used outdoors by an adult. Drawings can also be protected with a sheet of tracing paper instead.

GRADING

Sixth grade art is graded on effort, craftsmanship and growth in skill, not on talent. Each studio project and portfolio piece is scored with its checklist or rubric; sketchbook work is graded on completion and care.

PART	%
Studio projects	40

PART	%
Sketchbook	20
Unit reviews	15
Portfolio pieces	25

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

- Studio projects: use the lesson’s “check” list. A project that meets every check with care earns full marks, even if it is not polished.
- Sketchbook: full marks for every exercise attempted, dated, and done with attention. Do not grade the sketchbook for beauty.
- Unit reviews have 100 points each and include one or two short written answers. Let the student answer aloud first, then write.
- Portfolio pieces are graded with the unit rubric. Give a short written comment on what is strongest and one thing to work on next.
- Allow a redo of any project. Redrawing a subject is how artists improve.

A NOTE TO PARENTS

You do not need to be an artist to teach this course. Your job is to set the time aside, put good pictures and good materials in front of your student, ask the questions in each lesson, and hold a gentle standard: “Is that what you really see? Look again.” Drawing is a skill learned by doing, the same as handwriting or an instrument, and steady weekly practice matters more than any natural gift.

Sixth graders often become self-critical about their drawing just as their eyes improve faster than their hands. Expect some frustration, especially with faces in Unit 2. Praise specific things (“the shadow under that nose is just the right darkness”), keep old drawings to compare with new ones, and remind your student that the masters filled hundreds of sketchbooks. We make because we are made by the Maker, and patient, careful work is a way of giving thanks for the gift of sight.

UNIT 1

THE ELEMENTS AND PRINCIPLES OF ART

Every picture ever made, from a cave wall to a cathedral window, is built from the same few ingredients. Artists call them the **elements of art**: line, shape, form, value, color, texture and space. The ways an artist arranges those ingredients are called the **principles of design**: balance, emphasis, movement, rhythm and pattern, contrast, proportion, unity and variety.

This unit gives you that vocabulary and puts it to work. You will start the sketchbook you will keep all year, learn to draw from life the way Dürer drew his hare, and practice a four-step way of talking about any artwork: describe, analyze, interpret, judge. These words and habits will come back in every unit that follows.

PREREQUISITES

- Able to draw simple shapes and lines with control
- Knows the primary and secondary colors
- Has a sketchbook and a set of drawing pencils

MASTERY CHECKLIST

- ☐ I can name and define the seven elements of art.
- ☐ I can name the principles of design and find examples in a painting.
- ☐ I keep a dated sketchbook and draw in it from life several times a week.
- ☐ I can use describe, analyze, interpret and judge to talk about a work of art.
- ☐ I can explain the difference between an element and a principle.

LESSONS IN THIS UNIT

1.1 The Seven Elements of Art

2 sessions of 50 minutes

1.2 The Principles of Design

2 sessions of 50 minutes

1.3 The Sketchbook Habit

2 sessions of 50 minutes

1.4 Art Criticism: Describe, Analyze, Interpret, Judge

2 sessions of 50 minutes

UNIT 1 REVIEW

Answer each question. The student may answer short questions aloud, but questions 11 and 12 should be written in complete sentences. Have the unit's pictures available for questions that refer to them. 100 points total.

1. (7 pts)

Name all seven elements of art.

2. (7 pts)

What is the difference between a shape and a form? Give an example of each.

3. (7 pts)

What is value, and why is it so important in realistic drawing?

4. (7 pts)

What is the difference between actual texture and implied texture?

5. (8 pts)

Explain the difference between symmetrical and asymmetrical balance.

6. (8 pts)

What is emphasis? Name two ways an artist can create a focal point.

7. (7 pts)

What is the difference between an element and a principle?

8. (7 pts)

Why should a sketchbook be used mostly for drawing from life?

9. (7 pts)

Name the four steps of art criticism in order.

10. (7 pts)

In Constable's *The Hay Wain*, what balances the heavy dark trees on the right?

11. **14 pts**

Written answer: Describe and analyze Vermeer's *The Milkmaid* in four or five sentences. Name at least three elements and one principle.

12. **14 pts**

Written answer: Interpret and judge Millet's *The Angelus*. Give at least two pieces of evidence for your interpretation and two reasons for your judgment.

ANSWER KEY

1. Line, shape, form, value, color, texture, space.
2. A shape is flat (two dimensions), like a circle; a form has depth (three dimensions) or looks as if it does, like a sphere.
3. Value is how light or dark something is. It creates the illusion of form and light; if the values are right, a picture reads correctly even without color.
4. Actual texture can be felt (thick paint, rough paper); implied texture only looks as if it would feel a certain way (drawn fur, painted bread).
5. Symmetrical balance has matching halves, like a mirror image. Asymmetrical balance uses different things on each side that still feel equal in visual weight, such as a large pale shape balanced by a small dark one.
6. Emphasis makes one area stand out as the focal point. Ways: strongest light-dark contrast, brightest or only bright color, most detail, placing lines that lead to it, isolating it.
7. Elements are the ingredients (line, color, etc.); principles are the ways of arranging them (balance, emphasis, movement, etc.).
8. Real objects make you work out form, proportion and light yourself, which trains your eye; photos flatten things and make those decisions for you.
9. Describe, analyze, interpret, judge.
10. The cottage and darker trees on the left, together with the bright open meadow and sky; small red accents also help draw the eye.
11. Model: A maid pours milk by a window in a plain kitchen. Light comes from the window on the left, making the wall bright and the forms of the woman, jug and bread look round (value, form). Vermeer contrasts warm yellow with cool blue (color, contrast). The bread and basket have rich implied texture. The pouring milk is the focal point (emphasis), placed where the light is strongest.
12. Model: The painting is about faith in ordinary work: the couple stops labor to pray when the distant church bell rings. Evidence: bowed heads and folded hands; the steeple on the horizon; the quiet sunset colors. It is successful because the simple, balanced design and soft light give a feeling of reverence, and the subject is true to farm life and honors something good.

PORTFOLIO PIECE: AN OBJECT STUDY USING ALL SEVEN ELEMENTS

Choose one interesting object from your home or yard (a teapot, a boot, a basket of fruit, a pinecone and some leaves). Set it in light from one side. Make a careful, finished drawing on 11×14 in paper that clearly uses all seven elements and has a planned focal point and balance. On the back, write a short critique of your own piece using the four steps.

LOOK FOR	WHAT IT MEANS
Observation	Drawn from the real object; shapes and proportions are carefully observed.
Elements	All seven elements can be found, and value is used to show form and light.
Design	There is a clear focal point and a balanced, planned arrangement on the page.
Craftsmanship	Clean paper, confident lines, smooth or purposeful shading, signed and dated.
Self-critique	The written critique follows all four steps and gives specific reasons.

1.1 THE SEVEN ELEMENTS OF ART

OBJECTIVES

- Name and define the seven elements of art: line, shape, form, value, color, texture and space.
- Find each element in a master painting.
- Make a sampler page that shows each element with your own marks.

Warm-up. Look around the room for one minute. In your sketchbook, draw three things you can see using only lines: one straight-edged object, one curved object, and one object with a pattern on it. Do not erase.

WATCH

Review of the 8 Art Elements

Art Ed Guru • 13:35

https://www.youtube.com/watch?v=yN_M7pHwSSQ

WHEN TO WATCH

After reading the core ideas. An art teacher lays out cards and objects for each element; pause after each one and say its definition in your own words.

Note: He also names “mass” as an element; that is simply the bulk of a three-dimensional form, which the core ideas call form.

KEY TERMS

element of art

One of the basic visual ingredients every artwork is made of: line, shape, form, value, color, texture, space.

value

How light or dark something is, from white through grays to black.

shape vs. form

A shape is flat and has two dimensions (height and width). A form has three dimensions (height, width and depth) or is drawn to look as if it does.

texture

How a surface feels (actual texture) or looks as if it would feel (implied texture).

space

The area around, between and within things; in a picture, the illusion of depth.

CORE IDEAS

A cook works with flour, salt, water and heat; an artist works with seven visual ingredients called the **elements of art**. **Line** is a mark longer than it is wide; it can be thick or thin, straight or curved, calm or energetic, and it can also be *implied*, as when your eye follows the direction someone is pointing. **Shape** is a flat, enclosed area, either *geometric* (circles, squares, triangles) or *organic* (the irregular shapes of leaves, clouds and animals).

Form is shape with depth: a sphere instead of a circle, a cube instead of a square. On flat paper, form is only an illusion, and artists create it mostly with **value**, the range of light and dark. A circle shaded from light on one side to dark on the other suddenly looks round. That is why value is often called the most important element for realistic drawing: if the values are right, the picture reads correctly even in black and white.

Color has three properties you will study closely in Unit 3: *hue* (its name, like red or blue-green), *value* (how light or dark it is) and *intensity* or *chroma* (how bright or dull it is). **Texture** is either actual, like the ridges of thick paint, or implied, like the drawn fur of an animal. **Space** is the room in and around things; artists make flat paper seem deep by overlapping objects, making far things smaller, and placing them higher on the page.

The elements never appear alone. In any good picture they work together, and part of learning to see is learning to pull them apart in your mind. When you look at a painting this year, try asking: Where are the strongest lines? What are the big shapes? Where is the lightest light and the darkest dark? What textures can I almost feel?

God gave the world all of these things before any artist named them: the line of a horizon, the form of an apple, the texture of bark, the colors of morning. Learning the elements is really learning to notice what He has made.

PICTURE STUDY



The Milkmaid, Johannes Vermeer, about 1658 · Oil on canvas · Rijksmuseum, Amsterdam

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

Vermeer painted this quiet kitchen scene about 365 years ago. Almost nothing happens in it, yet it is one of the most loved paintings in the world, because every one of the seven elements is handled with great care. It is a perfect painting for learning to see them.

Look closely

- Find a strong **line**: the edge of the window, the stream of milk, the edge of the table.
- Find the big **shapes**: the bright wall, the triangle of the woman's body, the dark table.
- Which objects look most solid, like real **forms**? How did Vermeer make them look round?
- Look for **texture**: the crusty bread, the woven basket, the cracked plaster and nail holes in the wall.
- Find the warm yellow and the cool blue. Where are the lightest and darkest **values**?

Talk about it

1. Which element do you think Vermeer cared about most in this painting? Why?

2. How does the painting show **space**, so that the woman seems to stand in a real room?
3. The bread is painted with tiny dots of light. Why might Vermeer have done this?

STUDIO PROJECT

An Elements Sampler

You will make a reference page you can keep in the front of your sketchbook all year: one box for each element, filled with your own marks and small drawings. Making the marks yourself fixes the ideas in your hand as well as your head.

You will need

- Drawing paper, 11×14 in or a sketchbook spread
- Ruler
- HB and 4B pencils
- Colored pencils or oil pastels
- Fine black pen (optional)

Steps

1. With a ruler, divide your paper into eight boxes (two columns of four). Leave a strip at the top for a title.
2. Label the first seven boxes: Line, Shape, Form, Value, Color, Texture, Space. Label the last one “All Together.”
3. **Line:** fill the box with at least eight kinds of line: straight, curved, zigzag, thick, thin, broken, spiral, and one line that shows fast movement.
4. **Shape:** draw three geometric shapes and three organic shapes (a leaf, a cloud, a puddle). Shade the organic ones lightly.
5. **Form:** draw a sphere, a cube and a cylinder. Choose a light direction (say, upper left) and shade each form darker on the side away from the light.
6. **Value:** draw a strip of five squares and fill them from white to the darkest black your 4B pencil can make, in even steps.
7. **Color:** make a small color wheel of six colors, or three overlapping circles of red, yellow and blue where they mix.
8. **Texture:** draw four small squares that look like four different surfaces: wood grain, fur, brick, and something of your choice.
9. **Space:** draw three trees or three houses: one large and low on the page, one smaller and higher, one tiny near the top, overlapping the first.

10. **All Together:** draw a small object from your kitchen (a cup, an apple, a loaf of bread) using as many elements as you can. Write the date and your name on the page.

Tips

- Keep each box neat but not fussy. This is a reference page, not a finished picture.
- Press lightly for the first marks in each box; darken only at the end.

Check your work

- ☐ Every box is labeled and filled.
- ☐ My value strip goes from white to a true dark in even steps.
- ☐ My forms are shaded from one consistent light direction.
- ☐ I can point to each box and explain the element in one sentence.

SKETCHBOOK PRACTICE

1. Draw your shoe in contour line only (no shading), looking at the shoe more than at your paper.
2. Find five different textures in your house. Draw a 2-inch square of each and label them.
3. Draw one piece of fruit three times: once as a flat shape, once as a shaded form, once with color.

From history. Artists have always used these elements, but the list of seven became standard in art schools only in the early 1900s, when teachers such as Arthur Wesley Dow in America wrote books that broke picture-making into teachable parts.

COMMON MISTAKES

- Mixing up shape and form. If it is flat, it is a shape; if it has (or seems to have) depth, it is a form.
- Making a value scale that jumps from very light to very dark with nothing in between. Aim for even steps.
- Thinking color is the most important element. In realistic work, value usually matters more.

Make it a game • Seven Elements Scavenger Hunt. Race through the house for five minutes and bring back one object for each element: line, shape, form, value, color, texture and space. Lay them out and defend each choice in a sentence. Then explain how a shape differs from a form. Your parent can challenge any pick. Beat your own count next time.

Scripture. “And God saw every thing that he had made, and, behold, it was very good.” (Genesis 1:31, KJV)

Before any artist named line, form or color, God made them all and called them good. Studying the elements is a way of paying attention to His work.

1.2 THE PRINCIPLES OF DESIGN

OBJECTIVES

- Name and explain the main principles of design: balance, emphasis, movement, rhythm and pattern, contrast, proportion, unity and variety.
- Tell the difference between an element (an ingredient) and a principle (a way of arranging).
- Find at least four principles at work in Constable's *The Hay Wain*.
- Design a small picture that uses emphasis and balance on purpose.

Warm-up. Draw a 3-inch square three times. In the first, place one dot exactly in the center. In the second, place it near a corner. In the third, place one big dot and three small ones. Which square feels calm? Which feels lively? Write one word under each.

WATCH

Review of the Art Principles

Art Ed Guru • 13:06

<https://www.youtube.com/watch?v=sbHPvnlT2Cw>

WHEN TO WATCH

After the core ideas. Keep a list and add one example from the video to each principle.

KEY TERMS

principle of design

A way of arranging the elements of art in a picture, such as balance, emphasis or movement.

emphasis

Making one part of a picture stand out as the focal point, the place the eye goes first.

balance

The sense that the visual weight in a picture is evenly spread. It can be symmetrical (mirror-like) or asymmetrical (different things that still feel even).

movement

The path the viewer's eye travels through a picture.

unity and variety

Unity is the feeling that everything belongs together; variety is the differences that keep it interesting. Good pictures need both.

CORE IDEAS

If the elements are the ingredients, the **principles of design** are the recipe: the ways an artist arranges the ingredients so that the picture holds together and says something. Two artists can use the very same elements and get a dull picture or a great one; the difference is design.

Balance is about visual weight. Large, dark, bright or detailed things feel heavier than small, pale, plain ones. In *symmetrical* balance both halves match, which feels formal and still, like the front of a church. In *asymmetrical* balance a large shape on one side is balanced by a smaller but stronger one on the other, like a grown-up and a child on a seesaw, with the child sitting farther out. **Emphasis** gives the eye a place to land, usually through the strongest contrast of light and dark, the brightest color, or the most detail.

Movement is the route your eye travels. Artists guide it with lines, edges, repeated shapes and the directions figures face. **Rhythm and pattern** come from repetition: a row of trees, clouds or waves repeated with small changes, like a beat in music. **Contrast** is the difference between things placed side by side (light against dark, rough against smooth, warm against cool), and it is what makes anything visible at all.

Proportion is the size of parts compared with one another and with the whole. A tiny boat in a huge sea tells a different story than a huge boat in a small pond. **Unity** means the picture feels like one thing, not a pile of parts; it comes from repeated colors, shapes and a single light. **Variety** keeps unity from becoming boring. Too much unity is dull; too much variety is chaos.

These principles are not rules invented by a committee. They describe what makes order feel beautiful to the human mind. A well-designed picture, like a well-ordered garden, shows that someone has thought and cared.

PICTURE STUDY



The Hay Wain, John Constable, 1821 · Oil on canvas · National Gallery, London

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

Constable painted the countryside of his boyhood in Suffolk, England. This scene of a farm cart crossing a river looks natural and unplanned, but Constable spent months designing it. Every principle you just learned is at work here.

Look closely

- Find the focal point. What is the first thing your eye lands on? What makes it stand out?
- The big dark trees on the right are heavy. What on the left side balances them?
- Follow the movement: start at the cart and trace where your eye goes next, and next.
- Look for rhythm in the clouds and the trees, and for small spots of red repeated across the picture.
- Find a contrast of light against dark, and of warm against cool.

Talk about it

1. Is this picture balanced symmetrically or asymmetrically? How can you tell?
2. Look for small touches of red, such as on the horses' harness. Why might Constable put small spots of red into a mostly green picture?

3. If you covered the cart with your hand, would the picture still have a focal point? Where would your eye go?

STUDIO PROJECT

A Landscape Designed on Purpose

Constable planned his paintings with small sketches. You will plan a simple landscape in three thumbnail sketches, each trying a different balance, and then draw the best one larger with a clear focal point.

You will need

- Sketchbook
- Drawing paper, 9×12 in
- HB and 4B pencils
- Colored pencils or oil pastels
- Ruler

Steps

1. In your sketchbook, draw three rectangles about 3×4 inches. These are *thumbnails*, tiny planning sketches.
2. Choose a simple subject: a road, a barn or house, a big tree, a river or field, and sky.
3. Thumbnail 1: make it **symmetrical**, with the house or tree in the exact center.
4. Thumbnail 2: make it **asymmetrical**: a large dark tree on one side, balanced by a smaller, brighter house farther from the center on the other side.
5. Thumbnail 3: try any arrangement you like, using a road or river to create **movement** toward the house.
6. Shade each thumbnail with only three values: white, middle gray, dark. Choose the one that has the clearest focal point and the most interest.
7. Lightly draw your chosen design on the larger paper. Keep the big shapes the same as in the thumbnail.
8. Add color, saving your strongest contrast (lightest light next to darkest dark, or one bright color in a quiet area) for the focal point.
9. Add one repeated element for rhythm, such as a row of fence posts, birds, or clouds.

10. On the back, write which principles you used and where.

Tips

- Squint at your drawing: the focal point should still stand out when the details blur.
- Keep the edges of the paper quiet. Strong contrast at the very edge pulls the eye out of the picture.

Check your work

- ☐ I made three thumbnails before drawing large.
- ☐ My picture has one clear focal point.
- ☐ The visual weight feels balanced, even if the sides are different.
- ☐ I can name at least four principles I used.

SKETCHBOOK PRACTICE

1. Find a picture book or magazine photo. Draw a quick thumbnail of it and circle the focal point. Draw an arrow showing how your eye moves.
2. Draw a row of five objects from your kitchen in a line, then redraw them arranged with more variety of size and overlap. Which is more interesting?
3. Fill a page with a pattern that has rhythm: repeat one leaf shape at least twenty times, changing its size or angle a little each time.

From history. Constable showed *The Hay Wain* in London in 1821, where it did not sell. Three years later it won a gold medal at the Paris Salon, and French painters were amazed by his fresh greens and flickering white highlights, which later influenced the Impressionists.

COMMON MISTAKES

- Putting equal detail and contrast everywhere, so there is no focal point.
- Thinking asymmetrical means unbalanced. An asymmetrical picture can be perfectly balanced.
- Lining everything up in a row along the bottom of the page. Use overlap and different sizes.

Make it a game • Principle Charades. Write each principle of design on a slip: balance, emphasis, movement, rhythm, contrast, proportion, unity and variety. Draw one without showing it, then arrange buttons or draw a quick sketch that shows it. Your parent guesses which principle. Then say whether it is an ingredient or a way of arranging.

1.3 THE SKETCHBOOK HABIT

OBJECTIVES

- Set up a sketchbook for the year and understand what it is for.
- Draw from life with careful observation, using words and numbers as well as pictures.
- Begin a habit of short, regular drawing sessions.

Warm-up. Choose a small natural object (a leaf, a shell, a stone, a feather). Look at it for one full minute without drawing. Then hide it and draw it from memory. Then bring it back and draw it again while looking. Compare the two drawings.

WATCH

The Nature Journal Connection, Episode 1: Introduction to Nature Journaling

John Muir Laws · 12:28

<https://www.youtube.com/watch?v=0Fb65ZOjBDA>

WHEN TO WATCH

Before the studio project. Notice how he uses words, pictures and numbers together.

BACKUP VIDEO

5 Ways to Use your Sketchbook (To Improve your Art!)

KeshArt · 11:42

<https://www.youtube.com/watch?v=FgZ2RTF9lNg>

Optional, for more ideas on what to put in a sketchbook.

KEY TERMS

sketchbook

A bound book of drawing paper used for practice, study, planning and recording what you see.

study

A drawing or painting made to learn about a subject, not to be a finished artwork.

drawing from life

Making a drawing of a real object that is in front of you, rather than from a photo or from memory.

observation

Careful, patient looking that notices details, proportions, colors and light.

CORE IDEAS

Every great artist you will study this year kept something like a sketchbook. Leonardo filled thousands of notebook pages with plants, water, machines and faces. Dürer made studies of hands, animals and clumps of grass. A sketchbook is not a place for finished pictures; it is a **practice field**, a laboratory and a diary of what you have seen. Musicians practice scales; artists fill sketchbooks.

The most important kind of sketchbook drawing is **drawing from life**. A photograph flattens things and makes decisions for you about light and edges. A real object, sitting in front of you, makes you work out its form, its proportions and the way light falls on it. That work is exactly what trains your eye. Draw what is in front of you, even if it is only a cup or a sleeping cat.

Good sketchbook pages often mix **pictures, words and numbers**. Write the date, the place and the weather. Write what you notice (“the leaf is darker on top”), what you wonder (“why are the veins lighter?”), and what it reminds you of. Measure things: the leaf is 7 cm long, the bird came back four times. Words and numbers make you look more closely.

A sketchbook works only if you use it often. Ten or fifteen minutes on most days will improve your drawing far more than one long session a month. Keep it where you can grab it, carry a pencil, and never tear out pages you dislike. Your bad drawings are the record of your learning; in May you will be glad to see how far you have come.

Careful looking is a form of gratitude. When you draw a hare or a blade of grass slowly, you notice how wonderfully it is made, and you learn to see the world as a gift rather than a blur.

PICTURE STUDY



Young Hare, Albrecht Dürer, 1502 · Watercolor and bodycolor (opaque white) on paper · Albertina, Vienna

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

Dürer painted this hare in his workshop in Nuremberg more than 500 years ago. It is a study, made to learn and to record, not a grand painting for a church or palace. Yet it is so carefully observed that people still line up to see it.

Look closely

- Look at the direction of the fur. Does every hair point the same way? How does the direction change over the body?
- Find the window reflected in the hare's eye. What does it tell you about where Dürer was working?
- Where is the light coming from? Find the lightest and darkest parts of the fur.
- Look at the shadow under the hare. Why does it help the animal sit on the ground instead of floating?

Talk about it

1. How long do you think it took Dürer to paint this? What does that tell you about him?
2. Why might an artist make a careful study like this instead of just painting a hare from imagination?

3. What would you want to study this carefully?

STUDIO PROJECT

A Nature Study Page

You will set up your year's sketchbook and make your first full study page, using pictures, words and numbers to record one natural object the way Dürer and naturalists like him did.

You will need

- Sketchbook
- HB and 2B pencils
- Colored pencils or watercolor
- Ruler
- A natural object: a leaf, flower, pinecone, shell, feather or vegetable
- Magnifying glass (optional)

Steps

1. On the first page of your sketchbook, write your name, the year, and the sentence: "This book is for practice." If you like, add the motto *Fabricando fit faber*.
2. On a new page, write the date, place, time and weather in a corner.
3. Place your object where light falls on it from one side. Look at it for a full minute before drawing.
4. Draw it large (at least half the page) in light HB lines, starting with the overall shape, then the main divisions, then details.
5. Add shading with the 2B pencil to show form. Find the lightest light and the darkest dark first.
6. Draw one close-up detail in a small box next to the main drawing (the tip of a feather, the scale of a pinecone).
7. Measure your object with a ruler and write its size. Count something (petals, scales, veins).
8. Write three sentences: "I notice...", "I wonder...", "It reminds me of..."

9. Add color to part of the drawing, matching the real colors as closely as you can.

Tips

- Look at the object more than at your paper.
- If your first outline is wrong, draw the corrected line right next to it. Leave the first one; it shows your thinking.

Check your work

- ☐ My page has the date, place and weather.
- ☐ My drawing is large and drawn from the real object.
- ☐ I included a close-up, a measurement and three written observations.
- ☐ My shading shows where the light comes from.

SKETCHBOOK PRACTICE

1. Draw the same object (a cup, an apple, your hand) every day for five days, each time for ten minutes. Date each one.
2. Go outside or to a window and draw one bird, cloud or tree. Add three words or numbers about it.
3. Draw something you use every day (a fork, a pencil, a key) from three different angles.

From history. Dürer was the son of a goldsmith and trained first in his father's workshop, where he learned patient, exact handwork. His studies of animals and plants were treasured after his death, and collectors such as the Holy Roman Emperor Rudolf II bought them.

COMMON MISTAKES

- Drawing the object small in the middle of the page. Draw large so there is room for detail.
- Drawing what you think a leaf looks like instead of the particular leaf in front of you.
- Tearing out or erasing every mistake. A sketchbook should show the learning.

Make it a game • Sketchbook Score. Choose one household object and set a timer for three minutes. Draw it from life and gain a point for every careful observation you add as a picture, a word or a number, such as its height in thumbs. Then pick a new object and try to beat your score.

Scripture. “O LORD, how manifold are thy works! in wisdom hast thou made them all: the earth is full of thy riches.” (Psalms 104:24, KJV)

A sketchbook is a place to record some of those works. The more closely you look, the more you see of the wisdom in how they are made.

1.4 ART CRITICISM: DESCRIBE, ANALYZE, INTERPRET, JUDGE

OBJECTIVES

- Use four steps (describe, analyze, interpret, judge) to talk and write about an artwork.
- Support every opinion about art with evidence you can point to in the picture.
- Write a short critique of a master painting and of your own work.

Warm-up. Look at any picture in your house for one minute. Then close your eyes and list aloud everything you remember seeing, only facts (“a red cup on a table”), no opinions. Open your eyes and check what you missed.

WATCH

How to CRITIQUE Art for Beginners: RISD Art Professor Explains

Art Prof: Your Art School • 3:19

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

WHEN TO WATCH

After the core ideas, before the picture study. Notice how the professor starts by describing what she sees before giving any opinion.

BACKUP VIDEO

Feldman's 4 Steps to Art Criticism

mandersart • 9:17

<https://www.youtube.com/watch?v=UFXQgRd4UZ0>

Optional, a slower walk through Feldman’s four steps: describe, analyze, interpret, judge.

KEY TERMS

art criticism

Careful, organized thinking and talking about an artwork; not the same as complaining or finding fault.

describe

Step 1: list what you see, only facts, as if to someone who cannot see the picture.

analyze

Step 2: explain how the elements and principles are used.

interpret

Step 3: explain what the work means or what feeling it gives, using evidence from steps 1 and 2.

judge

Step 4: decide whether the work is successful and why, using clear reasons.

CORE IDEAS

Most people look at a painting for about the time it takes to say “I like it” or “I don’t.” **Art criticism** slows that down. The four steps described by the art teacher Edmund Feldman are a simple tool: **describe**, **analyze**, **interpret**, **judge**. They move from what anyone can see, to how it was made, to what it means, to whether it is good, and they keep you from jumping to the end.

Describe means listing facts only: the subject, the people and objects, the setting, the colors, the medium, the size. Imagine describing the picture over the telephone. **Analyze** uses the vocabulary from this unit: Where is the focal point? Is the balance symmetrical or asymmetrical? Where does the light come from? What colors repeat? How does the eye move?

Interpret asks what the picture is about and how it makes you feel, but every interpretation must point back to evidence. Not “It feels peaceful,” but “It feels peaceful because the horizon is low and flat, the colors are soft, and the two figures stand still with their heads bowed.” Knowing the title, the date and something of the artist’s life helps here.

Judge is the last step, not the first. A good judgment says whether the work succeeds and why. Classical teachers have long used three measures: Is it *true* (well observed, honest)? Is it *good* (does it lead the viewer toward what is worthy)? Is it *beautiful* (is it well made and well ordered)? You may admire a painting’s skill even if it is not your favorite, and you should be able to explain why.

Use the same four steps on your own work and on others’ work. Start with something specific that works, then one specific thing that could improve. Criticism done this way is a kindness: it helps the maker see.

PICTURE STUDY



The Angelus, Jean-François Millet, 1857–1859 · Oil on canvas · Musée d'Orsay, Paris

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

Millet grew up on a farm in Normandy, France, and painted the hard, quiet lives of farm workers. Here a man and woman stop digging potatoes when they hear the church bell ring for the Angelus, a prayer said at morning, noon and evening. It is an ideal painting for practicing all four steps.

Look closely

- **Describe:** list ten facts you can see. Include things in the background.
- **Analyze:** where is the horizon line? Where is the light coming from? What colors are repeated?
- Find the tiny church steeple. Where is it compared with the two figures?
- Notice the two figures' poses: how they stand, where their hands are, what the man is holding.

Talk about it

1. **Interpret:** what do you think this painting is about? Give at least two pieces of evidence.
2. Why might Millet have made the figures large and dark against the bright sky?

3. **Judge:** is this painting successful? Is it true, good and beautiful? Explain your reasons.

STUDIO PROJECT

A Written Critique and a Master Copy

To criticize a painting well you have to look at it very closely, and one of the best ways to look closely is to copy it. You will make a small value copy of *The Angelus* and then write a four-paragraph critique.

You will need

- Drawing paper, 9×12 in
- HB, 2B and 4B pencils
- Kneaded eraser
- Lined paper or sketchbook for writing
- The picture on a screen or printed

Steps

1. Draw a rectangle about 6×7½ inches (close to the shape of the painting).
2. Draw the horizon line first, about one-third of the way down from the top. Then lightly block in the two figures as simple tall shapes. Check their height against the rectangle.
3. Add the wheelbarrow, the basket and the fork. Find the steeple and place it carefully between the figures and the right edge.
4. Shade with only four values: the bright sky, the middle-value field, the darker field in front, and the darkest figures. Squint at the painting to see these big groups.
5. Add a little detail to the figures (hands, the hat, the folds of the apron), but keep them simple and dark.
6. Now write your critique in four short paragraphs: Describe, Analyze, Interpret, Judge.
7. In the Analyze paragraph, use at least four art terms from this unit.
8. In the Judge paragraph, give at least two reasons for your judgment.
9. Finally, write a two-sentence critique of your own copy: one thing that works and one thing to improve.

Tips

- Copying is not cheating. For centuries, students learned by copying the masters.
- Keep the critique's Describe paragraph free of opinion words like "beautiful" or "sad." Save those for later steps.

Check your work

- ☐ My copy has the horizon and figures in about the right places.
- ☐ I used at least four clear values.
- ☐ My critique has all four steps in order.
- ☐ Every opinion in my critique is backed by something I can point to.

SKETCHBOOK PRACTICE

1. Choose a picture from a book in your house and write a five-sentence Describe paragraph with no opinions.
2. Make a quick value thumbnail (three values only) of a painting from this unit.
3. Look back at your work from lessons 1.1 to 1.3 and write a short critique of your favorite page.

From history. When *The Angelus* was finished, few people wanted it. Later it became one of the most famous paintings in France, and in 1889 it sold for an enormous price at auction. Millet's simple farm scenes influenced the young Vincent van Gogh, who copied Millet's figures many times.

COMMON MISTAKES

- Jumping straight to "I like it" or "I don't." Judgment is the last step.
- Interpreting without evidence. Every "I think it means" needs a "because."
- Being harsh about a classmate's or sibling's work. Name a strength first, then one specific suggestion.

Make it a game • Evidence, Please. Pick any picture in a book. Walk through the four steps in order: describe, analyze, interpret, judge. Every opinion must be followed by 'because I can point to...' and a finger on the picture. Your parent says 'Evidence, please' if you skip it. Switch and let your parent try.

Scripture. “whatsoever things are true, whatsoever things are honest, whatsoever things are just, whatsoever things are pure, whatsoever things are lovely, whatsoever things are of good report; if there be any virtue, and if there be any praise, think on these things.” (Philippians 4:8, KJV)

Paul gives us a good measure for judging art and everything else: is it true, honest, pure, lovely, and worthy of praise?

UNIT 1

THE ELEMENTS AND PRINCIPLES OF ART

Every picture ever made, from a cave wall to a cathedral window, is built from the same few ingredients. Artists call them the **elements of art**: line, shape, form, value, color, texture and space. The ways an artist arranges those ingredients are called the **principles of design**: balance, emphasis, movement, rhythm and pattern, contrast, proportion, unity and variety.

This unit gives you that vocabulary and puts it to work. You will start the sketchbook you will keep all year, learn to draw from life the way Dürer drew his hare, and practice a four-step way of talking about any artwork: describe, analyze, interpret, judge. These words and habits will come back in every unit that follows.

PREREQUISITES

- Able to draw simple shapes and lines with control
- Knows the primary and secondary colors
- Has a sketchbook and a set of drawing pencils

MASTERY CHECKLIST

- ☐ I can name and define the seven elements of art.
- ☐ I can name the principles of design and find examples in a painting.
- ☐ I keep a dated sketchbook and draw in it from life several times a week.
- ☐ I can use describe, analyze, interpret and judge to talk about a work of art.
- ☐ I can explain the difference between an element and a principle.

LESSONS IN THIS UNIT

1.1 The Seven Elements of Art

2 sessions of 50 minutes

1.2 The Principles of Design

2 sessions of 50 minutes

1.3 The Sketchbook Habit

2 sessions of 50 minutes

1.4 Art Criticism: Describe, Analyze, Interpret, Judge

2 sessions of 50 minutes

UNIT 1 REVIEW

Answer each question. The student may answer short questions aloud, but questions 11 and 12 should be written in complete sentences. Have the unit's pictures available for questions that refer to them. 100 points total.

1. (7 pts)

Name all seven elements of art.

2. (7 pts)

What is the difference between a shape and a form? Give an example of each.

3. (7 pts)

What is value, and why is it so important in realistic drawing?

4. (7 pts)

What is the difference between actual texture and implied texture?

5. (8 pts)

Explain the difference between symmetrical and asymmetrical balance.

6. (8 pts)

What is emphasis? Name two ways an artist can create a focal point.

7. (7 pts)

What is the difference between an element and a principle?

8. (7 pts)

Why should a sketchbook be used mostly for drawing from life?

9. (7 pts)

Name the four steps of art criticism in order.

10. (7 pts)

In Constable's *The Hay Wain*, what balances the heavy dark trees on the right?

11. 14 pts

Written answer: Describe and analyze Vermeer's *The Milkmaid* in four or five sentences. Name at least three elements and one principle.

12. 14 pts

Written answer: Interpret and judge Millet's *The Angelus*. Give at least two pieces of evidence for your interpretation and two reasons for your judgment.

ANSWER KEY

1. Line, shape, form, value, color, texture, space.
2. A shape is flat (two dimensions), like a circle; a form has depth (three dimensions) or looks as if it does, like a sphere.
3. Value is how light or dark something is. It creates the illusion of form and light; if the values are right, a picture reads correctly even without color.
4. Actual texture can be felt (thick paint, rough paper); implied texture only looks as if it would feel a certain way (drawn fur, painted bread).
5. Symmetrical balance has matching halves, like a mirror image. Asymmetrical balance uses different things on each side that still feel equal in visual weight, such as a large pale shape balanced by a small dark one.
6. Emphasis makes one area stand out as the focal point. Ways: strongest light-dark contrast, brightest or only bright color, most detail, placing lines that lead to it, isolating it.
7. Elements are the ingredients (line, color, etc.); principles are the ways of arranging them (balance, emphasis, movement, etc.).
8. Real objects make you work out form, proportion and light yourself, which trains your eye; photos flatten things and make those decisions for you.
9. Describe, analyze, interpret, judge.
10. The cottage and darker trees on the left, together with the bright open meadow and sky; small red accents also help draw the eye.
11. Model: A maid pours milk by a window in a plain kitchen. Light comes from the window on the left, making the wall bright and the forms of the woman, jug and bread look round (value, form). Vermeer contrasts warm yellow with cool blue (color, contrast). The bread and basket have rich implied texture. The pouring milk is the focal point (emphasis), placed where the light is strongest.
12. Model: The painting is about faith in ordinary work: the couple stops labor to pray when the distant church bell rings. Evidence: bowed heads and folded hands; the steeple on the horizon; the quiet sunset colors. It is successful because the simple, balanced design and soft light give a feeling of reverence, and the subject is true to farm life and honors something good.

PORTFOLIO PIECE: AN OBJECT STUDY USING ALL SEVEN ELEMENTS

Choose one interesting object from your home or yard (a teapot, a boot, a basket of fruit, a pinecone and some leaves). Set it in light from one side. Make a careful, finished drawing on 11×14 in paper that clearly uses all seven elements and has a planned focal point and balance. On the back, write a short critique of your own piece using the four steps.

LOOK FOR	WHAT IT MEANS
Observation	Drawn from the real object; shapes and proportions are carefully observed.
Elements	All seven elements can be found, and value is used to show form and light.
Design	There is a clear focal point and a balanced, planned arrangement on the page.
Craftsmanship	Clean paper, confident lines, smooth or purposeful shading, signed and dated.
Self-critique	The written critique follows all four steps and gives specific reasons.

UNIT 2

DRAWING PROPORTION AND PORTRAITS

The human face is the hardest and most rewarding subject an artist can draw. We look at faces all day, so we notice instantly when something is a little off. This unit gives you the tools to get proportion right: **sighting** with a pencil held at arm's length, the classical **proportions of the face**, and the structure of the individual features.

You will study portraits by Raphael, Vermeer, Leonardo and Rembrandt, and finish with a self-portrait drawn from a mirror, the same exercise the masters set themselves again and again. Expect this unit to stretch you. Faces take practice, and every careful attempt teaches your eye something.

PREREQUISITES

- Knows the elements of art, especially line, shape and value (Unit 1)
- Can shade a simple form from light to dark
- Keeps a sketchbook

MASTERY CHECKLIST

- ☐ I can sight-measure with a pencil to compare sizes and find angles.
- ☐ I can place the eyes, nose, mouth and ears in correct proportion on a front-view head.
- ☐ I can draw each facial feature as a form with light and shadow, not as a symbol.
- ☐ I can draw a recognizable self-portrait from a mirror.
- ☐ I can explain how Leonardo, Raphael, Vermeer and Rembrandt made their portraits look alive.

LESSONS IN THIS UNIT

2.1 Sighting and Measuring

2 sessions of 50 minutes

2.2 Proportions of the Face

2 sessions of 50 minutes

2.3 Drawing the Features

2 sessions of 50 minutes

2.4 A Self-Portrait from a Mirror

2 sessions of 50 minutes

UNIT 2 REVIEW

Answer each question. Questions 11 and 12 should be written in complete sentences. You may draw a quick sketch to help explain any answer. 100 points total.

1. (7 pts)

Explain how to sight-measure with a pencil. Include what to do with your arm and eyes.

2. (7 pts)

What is a unit of measure, and why use one?

3. (7 pts)

What is a plumb line, and what can it show you?

4. (7 pts)

On an adult head, where do the eyes sit?

5. (7 pts)

Name the three nearly equal parts of the face.

6. (7 pts)

How wide is the space between the eyes? How wide is the head across the eyes?

7. (7 pts)

Where are the ears placed?

8. (7 pts)

What is the difference between symbol drawing and observational drawing of a feature?

9. (7 pts)

What is sfumato, and which artist is famous for it?

10. (7 pts)

Why does likeness depend more on proportion than on detail?

11. 15 pts

Written answer: Choose either the *Mona Lisa* or *Girl with a Pearl Earring*. In four or five sentences, explain how the artist painted the features and the light to make the face seem alive.

12. 15 pts

Written answer: Describe how you would set up to draw a self-portrait from a mirror, and list the order of steps you would follow.

ANSWER KEY

1. Stretch your arm straight with the elbow locked, close one eye, line the pencil tip up with the top of the object, and slide your thumb to mark the bottom. Use that length to compare other parts.
2. One length (like the height of a mug or a head) used to measure everything else. It keeps all the proportions consistent with each other.
3. A true vertical line (the pencil held straight up and down). It shows which parts line up above or below each other and helps judge angles.
4. About halfway between the top of the head and the bottom of the chin.
5. Hairline to eyebrows; eyebrows to bottom of the nose; bottom of the nose to the chin.
6. About one eye-width between the eyes; the head is about five eyes wide.
7. From about the line of the eyebrows down to the bottom of the nose.
8. Symbol drawing uses a remembered shape (football eye, L nose); observational drawing shows the real shapes of light and shadow you see.
9. Soft, smoky blending of tones with no hard edges; Leonardo da Vinci.
10. We recognize people by the overall shape of the head and the distances between features; if those are wrong, details cannot fix it.
11. Model (Mona Lisa): Leonardo blended the corners of the mouth and eyes into shadow with sfumato, so there is no hard edge and the expression seems to shift. The light falls softly from the left, modeling the forehead, cheeks and chin as rounded forms. There are no outlines, only gradual tones. The misty background repeats the softness. Model (Pearl Earring): Vermeer turned the head over the shoulder so the girl seems caught in a moment; bright highlights on the eyes, lips and pearl against a dark background make the face glow.
12. Model: Put the mirror at eye level where I can see myself by moving only my eyes; light my face from one side; mark the top of my head and chin on the mirror with tape. Then draw the head shape large and light, add the center line and eye line, place nose, mouth, brows and ears with sighting, add hair, neck and shoulders, check proportions, shade the big shadow side, then refine the features and finish the darks and highlights.

PORTFOLIO PIECE: A PORTRAIT OF SOMEONE I LOVE

Draw a finished graphite portrait of a family member or friend from life (or from your own clear photo if they cannot sit long). Light the face from one side. Use sighting and the facial proportions to build the head, draw the features as forms, and include the neck and shoulders. Aim for a true likeness and a clear light side and shadow side.

LOOK FOR	WHAT IT MEANS
Proportion	Features are placed correctly and checked with sighting; the head, neck and shoulders relate well.
Features as forms	Eyes, nose, mouth and ears are shaded with light and shadow, not outlined as symbols.
Light and value	A single light direction is clear, with a full range of values from highlight to dark accents.
Likeness	The sitter is recognizable.
Craftsmanship	Guidelines are erased or absorbed, the paper is clean, and the portrait is signed and dated.

2.1 SIGHTING AND MEASURING

OBJECTIVES

- Measure proportions by sighting with a pencil at arm's length.
- Find angles with a pencil held vertically or horizontally.
- Use one unit of measure to check every other part of a drawing.

Warm-up. Hold your pencil at arm's length and close one eye. Line it up with a door frame, a table edge and a picture frame. Is each edge truly vertical, truly horizontal, or tilted? Draw three short lines in your sketchbook showing the tilt of three edges you found.

WATCH

How To Draw With Sighting

Drawsh Studio · 8:09

<https://www.youtube.com/watch?v=2sK4O5Zdhcs>

WHEN TO WATCH

After the core ideas. Get your own pencil out and copy each move as he shows it.

BACKUP VIDEO

Easy Way to Draw Accurately - How to Pencil - Artist Advice

Draw Mix Paint · 8:46

<https://www.youtube.com/watch?v=v-PWjlah7dw>

Optional, a second clear explanation using a brush handle instead of a pencil.

KEY TERMS

proportion

The size of one part compared with another part or with the whole.

sighting

Measuring what you see by holding a pencil at arm's length, with one eye closed, and comparing sizes and angles.

unit of measure

One length (for example, the height of a cup) used to measure everything else in a drawing.

plumb line

A true vertical line (named after a weight on a string) used to check what lines up above or below what.

CORE IDEAS

Your brain is very good at recognizing things and very bad at measuring them. It tells you that a plate is round even when, from where you sit, it is a thin oval; it tells you a far chair is “chair-sized” even though it looks tiny. **Sighting** is a way of overruling the brain with a simple tool: a pencil held at arm’s length.

To sight, sit in one place, close one eye, and stretch your arm out straight with the elbow *locked*. (If your arm bends, the measurements change.) Line the tip of the pencil up with the top of an object and slide your thumbnail down the pencil to mark the bottom. That length is your **unit of measure**. Now, without moving your thumb, turn the pencil sideways and see how many units wide the object is. If a vase is one unit tall and half a unit wide, your drawing must be twice as tall as it is wide, at any size.

Sighting gives **comparisons**, not inches. You are not copying the pencil length onto the paper; you are discovering ratios (“the handle is one-third of the cup’s height”) and then keeping those ratios in your drawing. Choose a unit that is easy to see and appears several times, such as the height of a head or the width of a window.

You can also sight **angles**. Hold the pencil perfectly vertical (a plumb line) or horizontal and compare the edge you see with it. Is the roof edge tilted a little or a lot? Then draw that same tilt against the edge of your paper. Plumb lines also show alignment: drop the vertical pencil down from the corner of an eye and see what it lines up with below.

Sighting will feel slow at first. Use it to lay in the big proportions and to check your drawing when something looks wrong. With practice, your eye starts to measure on its own, and you will need the pencil less.

PICTURE STUDY



Portrait of Baldassare Castiglione, Raphael, about 1514–1515 · Oil on canvas · Louvre, Paris

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

Raphael painted his friend Castiglione, a courtier and writer who wrote a famous book about good manners and noble character. The portrait looks simple and calm, but its proportions and placement are so exact that later masters, including Rembrandt and Rubens, studied and copied it.

Look closely

- Measure with your eye: how many head-heights tall is the whole figure that we can see, from the top of the cap to the bottom edge?
- Imagine a plumb line dropped from the center of his nose. What does it line up with below?
- Find the big triangle made by his head and his two arms.
- Notice how few colors Raphael used. Which ones can you find?

Talk about it

1. Why do you think Raphael placed the head above the center of the painting rather than in the exact middle?
2. How does the calm, balanced pose fit a man known for good manners and self-control?
3. What would change if his hands were raised or his head were tilted?

STUDIO PROJECT

A Measured Still Life

Before measuring faces, you will practice on objects that sit still and never complain. You will draw a group of three kitchen objects, using sighting to get their proportions and placement right.

You will need

- Drawing paper, 11×14 in
- HB and 2B pencils
- Kneaded eraser
- Three objects of different heights: a bottle, a mug, a fruit or box
- A table you can sit at without moving

Steps

1. Arrange the three objects so that some overlap. Sit where you can see them all, and mark where your chair is; do not move it during the drawing.
2. Choose your unit of measure: the height of the mug works well.
3. Sight the whole group. How many mug-heights wide is it? How many tall? Lightly draw a box on your paper with that same ratio, filling most of the page.
4. Inside the box, mark the top and bottom of each object, using the mug as your unit (“the bottle is two and a half mugs tall”).
5. Mark the widths the same way. Use plumb lines to check: what part of the bottle is directly above the edge of the mug?
6. Sight the angles of any tilted edges (the slope of the bottle’s shoulders) and copy them.
7. Draw the outline of each object over your marks. Remember that the tops of round objects are ovals (ellipses), not straight lines.
8. Check three measurements again before you shade. Fix anything that is off.
9. Shade lightly with the 2B pencil to show the light side and the shadow side of each object.

Tips

- Lock your elbow every time you measure.
- Measure, draw, check. Then measure again. Artists check constantly.

Check your work

- ☐ I used one unit of measure for the whole drawing.
- ☐ The heights and widths of my objects match what I see.
- ☐ I checked alignment with at least two plumb lines.
- ☐ My drawing fills the page.

SKETCHBOOK PRACTICE

1. Sight-measure a doorway in your house: how many door-widths tall is it? Draw it with the correct proportion.
2. Draw a chair, using the height of its seat as your unit of measure.
3. Sight a family member sitting still and reading. How many head-heights tall are they from head to seat?

From history. Castiglione's *Book of the Courtier* (1528) described the ideal gentleman as skilled, modest and graceful, never showing off. Raphael's portrait shows exactly that kind of quiet dignity. When the painting was sold in Amsterdam in 1639, Rembrandt was in the room and made a quick sketch of it.

COMMON MISTAKES

- Bending the elbow, which changes every measurement.
- Moving your head or chair between measurements.
- Drawing the object small and then measuring. Decide the size first with the overall box, then measure inside it.

Make it a game • Match the Angle. Your parent holds a ruler or broom at a secret angle. Hold your pencil at arm's length, copy the angle by sighting, then draw it on paper. Hold the paper against the ruler to check. A close match earns two points. Switch roles. Play to ten points.

2.2 PROPORTIONS OF THE FACE

OBJECTIVES

- Construct a front-view head using the classical proportions.
- Place the eyes, nose, mouth and ears correctly with guidelines.
- Notice how real faces vary from the average proportions.

Warm-up. Use your fingers to measure your own face in a mirror: Is the distance from your eyebrows to the bottom of your nose about the same as from the bottom of your nose to your chin? Write what you find.

WATCH

How to Draw a Face: Step by Step for Beginners

Circle Line Art School • 13:11

<https://www.youtube.com/watch?v=p39WnAvQqVw>

WHEN TO WATCH

During the studio project. Pause after each step and draw along.

BACKUP VIDEO

HOW TO DRAW: FACE | Basic Proportion

Lazy Arts • 10:37

<https://www.youtube.com/watch?v=SBbmV6g4CKU>

Optional, a second clear walk-through of the same proportions.

KEY TERMS

center line

A vertical guideline down the middle of the face, through the nose and mouth.

eye line

A horizontal guideline about halfway down the head where the eyes sit.

thirds of the face

The face from hairline to chin divides into three roughly equal parts: hairline to brow, brow to bottom of nose, bottom of nose to chin.

proportion

The size and placement of parts compared with each other and with the whole.

CORE IDEAS

When people first draw faces, they usually put the eyes too high, as if the forehead were tiny. In fact, on an adult head the **eyes sit about halfway** between the top of the head and the bottom of the chin. Much of the top half is forehead and hair. (On children the eyes sit a little lower, because the top of the head is large compared with the face; at your age, they are just below halfway.)

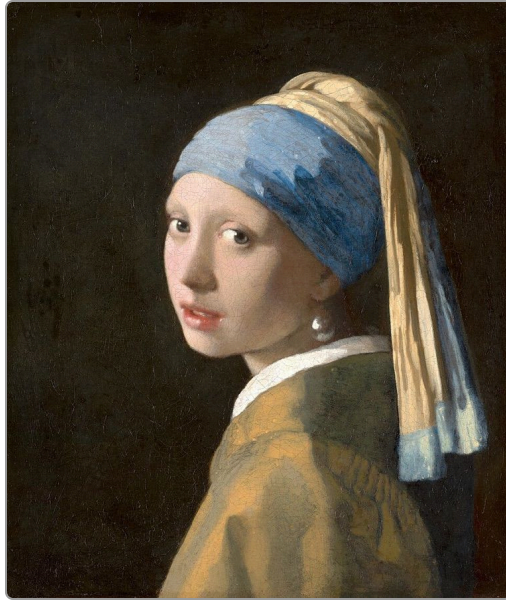
The face from the hairline to the chin divides into **three nearly equal parts**: hairline to eyebrows, eyebrows to the bottom of the nose, bottom of the nose to the chin. The mouth sits about a third of the way down from the nose to the chin. The tops of the ears line up with the eyebrows and their bottoms with the bottom of the nose.

Across the face, the head is about **five eyes wide**, with one eye-width between the two eyes. The sides of the nose line up with the inner corners of the eyes, and the corners of the mouth line up roughly with the pupils. The neck is almost as wide as the jaw, much wider than most beginners draw it.

These measurements are an average, a starting scaffold. Every real face differs a little: a longer nose, wider-set eyes, a stronger chin. Those small differences are exactly what make a person recognizable. Use the proportions to build the head, then use sighting to find how your sitter is different from the average.

Draw guidelines lightly with a hard pencil (2H or HB) so they can disappear later. A head built on good guidelines is like a house built on a good foundation.

PICTURE STUDY



Girl with a Pearl Earring, Johannes Vermeer, about 1665 · Oil on canvas · Mauritshuis, The Hague

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

This is not a portrait of a known person but a *tronie*, a Dutch study of a face, expression or costume. Vermeer turns the head so the face is seen almost from the front while the body faces away. It is a wonderful painting for studying the proportions of the face.

Look closely

- Find the eye line. Is it near the middle of the head (including the turban)?
- Follow the center line from the forehead down the nose to the chin. Is it straight up and down, or tilted?
- Compare the distance from the brows to the bottom of the nose with the distance from the nose to the chin.
- Find the three brightest spots: the pearl, the eyes and the lower lip.

Talk about it

1. Why does the turned head make the girl seem to be looking at you in a living moment?
2. How does the dark background help the face stand out?
3. If the eyes had been painted higher on the head, how would the girl look different?

STUDIO PROJECT

Building a Head Step by Step

You will construct a front-view head from guidelines, twice: once as an average head using the classical proportions, and once adjusted to look like someone in your family, using sighting to find what makes their face their own.

You will need

- Drawing paper, 9×12 in (two sheets)
- 2H or HB pencil and 2B pencil
- Kneaded eraser
- Ruler
- A family member willing to sit for five minutes (or a clear front-view photo of one)

Steps

1. Draw an egg shape, wider at the top, about 7 inches tall. This is the head without hair.
2. Draw a light vertical center line down the middle, and a horizontal eye line exactly halfway down.
3. Divide the eye line into five equal parts. The second and fourth parts are the eyes. Draw them as simple almond shapes.
4. Find the bottom of the nose halfway between the eye line and the chin. Make the nose as wide as the space between the eyes.
5. Find the mouth line about a third of the way from the nose to the chin. Make the mouth reach from pupil to pupil.
6. Draw the eyebrows just above the eyes, and the ears from the brow line down to the nose line.
7. Add the hairline about a third of the way from the brows to the top of the head, then draw the hair outside the egg so it has thickness. Add a neck almost as wide as the jaw.
8. On your second sheet, repeat the steps while looking at your family member. Sight-measure: is their nose longer? Are their eyes wider apart? Adjust the

guidelines to match.

9. Erase the guidelines lightly and add soft shading under the brows, beside the nose, and under the lower lip and chin.

Tips

- Keep everything light until the proportions are right. Dark lines are hard to move.
- Most beginners make the eyes too large and too high. Check both.

Check your work

- ☐ The eyes are about halfway down the head.
- ☐ There is one eye-width between the eyes.
- ☐ The ears line up between the brows and the bottom of the nose.
- ☐ My second drawing shows at least one way my sitter differs from the average.

SKETCHBOOK PRACTICE

1. Draw five eggs and fill each with guidelines and features. Do this quickly, two minutes each.
2. Find portraits in a book. Draw the center line and eye line over a quick sketch of each and see how the artist placed the features.
3. Draw a front-view child's head and an adult head side by side. Place the child's eyes a little lower.

From history. Artists have searched for the proportions of the face since ancient times. In the Renaissance, Leonardo and Dürer measured many faces and wrote down their findings; Dürer published whole books on human proportion. Their measurements are close to the ones art students still learn.

COMMON MISTAKES

- Eyes too high, leaving almost no forehead.
- A neck as thin as a pencil. The neck is nearly as wide as the jaw.
- Ears too small or placed too low. Check them against the brow line and nose line.

Make it a game • Head Map from Memory. Draw a blank oval for the head and set a ninety-second timer. Add the center line, the eye line, the thirds, and then the eyes, nose, mouth and ears from memory. Then check against your own face in a mirror. Point out any feature that was off by a little. Fewer corrections scores higher.

2.3 DRAWING THE FEATURES

OBJECTIVES

- Draw the eye, nose, mouth and ear as three-dimensional forms, not flat symbols.
- Use light and shadow to show the planes of each feature.
- Observe how Leonardo used soft edges to give life to the features.

Warm-up. Draw an eye the way you drew it when you were six. Next to it, write three things a real eye has that the six-year-old eye is missing. (Hint: look in a mirror at your eyelids, the shape of the white, and the highlight.)

WATCH

DRAW Eyes, Nose, Lips, Ears | Part 1: Front View

Lazy Arts • 11:28

<https://www.youtube.com/watch?v=3wbPZK1p3f4>

WHEN TO WATCH

During the studio project. Pause after each feature and draw it yourself.

KEY TERMS

symbol drawing

Drawing what you think something looks like (a football-shaped eye, an L-shaped nose) instead of what you actually see.

plane

A flat or gently curved surface facing one direction; the side of the nose is one plane, the top another.

sfumato

Italian for “smoky”: Leonardo’s way of blending tones so softly that edges seem to melt, with no hard lines.

highlight

The brightest spot, where light reflects most directly, such as the glint in an eye.

CORE IDEAS

Each feature of the face is a **form** sitting on a rounded head, and it is drawn with light and shadow, not just outlines. The biggest step forward in portrait drawing is to stop drawing **symbols** (an eye shaped like a lemon, a nose like the letter L, lips like a red bow) and start drawing the shapes of light and dark you actually see.

The eye is a ball set into a socket. The eyelids wrap around it, so the upper lid has thickness and casts a shadow on the eyeball. The iris is a circle partly covered by the upper lid; you rarely see white above it. The white of the eye is not pure white; it is shaded, because it is round. One small, crisp highlight on the iris brings the whole eye to life.

The nose is mostly drawn by its shadows. Think of it as a wedge: a top plane facing the light, two side planes, and an underside with the nostrils. Usually you draw the shadow under the nose and on the side away from the light, and leave the bridge almost without a line. **The mouth** has an upper lip that usually faces down and is darker, a lower lip that faces up and catches light, and a dark line between them that is darkest at the corners. The lower lip is shown mostly by the shadow beneath it.

The ear is shaped like a question mark with an inner curve, roughly parallel to the line of the nose in side view. On a front-view head you see it from the edge, so it looks narrow.

Leonardo da Vinci gave his faces life with **soft edges**. The corners of the Mona Lisa's mouth and eyes are blended into shadow so gently that we cannot tell exactly where they end, and so her expression seems to change as we look. Keep your shadows soft where forms turn gradually, and save sharp edges and the darkest darks for a few important places.

PICTURE STUDY



Mona Lisa, Leonardo da Vinci, about 1503–1519 · Oil on poplar panel · Louvre, Paris

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

Leonardo worked on this portrait of a Florentine merchant's wife, Lisa Gherardini, for many years and never gave it away. It is probably the most famous painting in the world. We look at it now for one reason: the astonishing way Leonardo painted the features of the face.

Look closely

- Look closely at the corners of her mouth. Can you find an exact edge?
- Look at the eyes. Where is the shadow under the brow? Is there a hard line around the eyelids?
- Find the shadow under the nose and under the lower lip. How dark is it?
- Notice that she has no clear eyebrows. Does the face still look complete?

Talk about it

1. Why do you think her smile seems to change when you look at different parts of the painting?
2. What would happen to the face if Leonardo had outlined every feature in a dark line?
3. How does the soft, misty landscape behind her match the way the face is painted?

STUDIO PROJECT

A Page of Features from Life

Using a mirror, you will draw your own eye, nose, mouth and ear, each large and with full shading. Drawing the features separately, at large size, lets you see the forms before you put them together in a self-portrait.

You will need

- Drawing paper, 11×14 in
- HB, 2B and 4B pencils
- Kneaded eraser
- Blending stump or tissue
- A mirror
- A lamp lighting your face from one side

Steps

1. Divide your paper into four sections. Set up the mirror and lamp so one side of your face is lit and the other in gentle shadow.
2. **Eye:** draw your eye about 3 inches wide. Start with the eyelid shapes, then the iris (partly hidden by the upper lid), then the pupil. Shade the upper lid's shadow on the eyeball, shade the white near the corners, and leave one tiny highlight.
3. Add the eyebrow with short strokes in the direction the hairs grow, and a soft shadow in the socket under the brow.
4. **Nose:** draw your nose large. Draw only the nostrils and the shadow shapes: the dark underside, the side away from the light, the shadow it casts on the cheek. Let the bridge be shown by the change of tone, not a line.
5. **Mouth:** draw the dark line where the lips meet first, darkest at the corners. Shade the upper lip a middle tone, leave the lower lip lighter, and shade the shadow underneath it.
6. **Ear:** turn your head to see your ear in the mirror (or draw a family member's). Draw the outer question-mark shape, then the inner curves, then shade the deep hollows.

7. With the blending stump, soften transitions where forms turn gently. Keep a few edges crisp.
8. Use the kneaded eraser to lift highlights on the nose tip, the lower lip and the eye.

Tips

- Draw what you see, not what you know. If you cannot see a line, do not draw one.
- Squint to find the shadow shapes, then draw those shapes.

Check your work

- ☐ Each feature is shaded to look like a form, not outlined like a symbol.
- ☐ My eye has a lid with thickness, a partly covered iris and a highlight.
- ☐ My nose is drawn mostly with shadows.
- ☐ The lower lip is shown by the shadow beneath it.

SKETCHBOOK PRACTICE

1. Draw ten eyes from photos of different people, five minutes each. Notice how different they are.
2. Draw a family member's nose from the side, from the front and from three-quarters.
3. Copy the eyes and mouth of the Mona Lisa, trying to keep the edges soft.

From history. Leonardo filled notebooks with studies of the muscles and structure of the face to understand how expressions form. He believed a painter should know what lies under the skin in order to paint the surface truthfully.

COMMON MISTAKES

- Drawing a dark outline all the way around the eye or nose.
- Showing the whole iris as a full circle surrounded by white, which makes the eye look startled.
- Drawing lips as one dark, flat shape. The upper and lower lips face different directions and have different values.

Make it a game • Symbol or Real?. Draw an eye in sixty seconds as a flat symbol, an almond shape with a circle. Then draw a real eye from life, showing planes, highlight and soft shadow. Your parent decides which is which and what was different. Repeat with a nose or an ear. Say what sfumato means.

2.4 A SELF-PORTRAIT FROM A MIRROR

OBJECTIVES

- Combine sighting, facial proportions and the features in a finished self-portrait.
- Set up good light and a steady mirror for drawing from life.
- Study how Rembrandt observed himself honestly over a lifetime.

Warm-up. Look in a mirror for two minutes without drawing. Then, in your sketchbook, write five things about your face that make it your own (the shape of your eyebrows, how far apart your eyes are, the shape of your chin).

WATCH

How To Draw A Charcoal Portrait From Life

SIMPLIFY Drawing and Painting · 3:40

<https://www.youtube.com/watch?v=wCzzV8V1t-8>

WHEN TO WATCH

Before you set up your mirror. Watch how he stands back, measures with his pencil and blocks in the big shapes of light and shadow first; you will do the same, looking at yourself in the mirror.

Note: He draws a seated model rather than himself, but the measuring and the order of work are the same for a self-portrait.

KEY TERMS

self-portrait

A portrait an artist makes of himself or herself, usually using a mirror.

likeness

How much a portrait looks like the particular person.

three-quarter view

A view of the head turned partly to the side, between front view and profile.

reversal

A mirror shows you reversed left to right, so a self-portrait shows you as you see yourself, not as others see you.

CORE IDEAS

Artists have always drawn themselves, for a simple reason: the model is always available, never gets tired, and works for free. A **self-portrait** is also the hardest test of honest seeing, because you must draw what is really there instead of what you wish were there.

The **setup** matters as much as the drawing. Put the mirror where you can see your face by moving only your eyes, not your head. Sit so your face is lit from one side by a window or lamp, which gives a clear light side and shadow side. Mark the position of your head (a small tape mark on the mirror at the top of your head and your chin helps), and return to the same pose every time you look up.

Work from big to small. First, sight the overall shape of the head and hair and place it on the page so it is large, a little above center, with room for the neck and shoulders. Then place the guidelines from Lesson 2.2, adjusted to your own face. Only then draw the features from Lesson 2.3, and finally the shading, starting with the large shadow side.

Likeness comes mostly from proportion and the big shapes, not from tiny details. If the distances between the eyes, nose, mouth and chin are right, and the shape of the head and hair is right, the drawing will look like you even before the details are finished. If they are wrong, no amount of eyelashes will fix it. Check with sighting often.

You are made in the image of God, and your face is one of a kind. Drawing it carefully is not vanity; it is a practice in seeing truthfully, and the masters returned to it all their lives.

PICTURE STUDY



Self-Portrait with Two Circles, Rembrandt van Rijn, about 1665–1669 · Oil on canvas · Kenwood House, London

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

Rembrandt painted and drew himself nearly a hundred times, from a curious young man to an old man who had known loss and hardship. Here, near the end of his life, he shows himself as what he was: a working painter, holding his palette and brushes, looking straight at us in a mirror.

Look closely

- Find where the light comes from. Which side of his face is lit, and which is in shadow?
- Look at the face compared with the hands. Which is painted with more detail? Why might that be?
- Look at the two large circles on the wall. What shapes do they make with his figure?
- Notice the thick paint on the face. Where is it thickest?

Talk about it

1. What does this self-portrait tell you about how Rembrandt saw himself?
2. Why do you think he did not try to make himself look younger or more handsome?

3. Rembrandt was looking in a mirror. Which hand do you think really held the brush?

STUDIO PROJECT

My Self-Portrait

Now you put the whole unit together: a finished self-portrait drawn from a mirror, in graphite, with a clear light side and shadow side.

You will need

- Drawing paper, 11×14 in
- 2H, HB, 2B and 4B pencils
- Kneaded eraser
- Blending stump
- A mirror you can prop up or hang
- A lamp or window for side light
- Masking tape

Steps

1. Set up the mirror at eye level and the light to one side. Sit comfortably; you will be here a while. Put small tape marks on the mirror at the top of your head and your chin.
2. With the 2H pencil, lightly draw the egg shape of your head, large, a little above the center of the paper. Sight-measure: how wide is your head compared with its height?
3. Add the center line and eye line. Sight-check where your eyes really fall.
4. Place the bottom of the nose, the mouth, the brows and the ears. Check each with sighting and adjust.
5. Draw the hair as a big shape with thickness, and the neck and the line of the shoulders.
6. Stop and check proportions with a fresh eye. Hold your drawing up next to the mirror. Fix anything that is off now, before shading.
7. Shade the large shadow side of the face with a light, even tone. Then shade the eye sockets, under the nose, under the lower lip and under the chin.
8. Draw the features in more detail, using what you learned in Lesson 2.3.

9. Darken the hair and the darkest accents with the 4B. Lift highlights with the kneaded eraser. Sign and date your portrait.

Tips

- Take breaks every 20 minutes and look at your drawing in the mirror. A reversed view shows mistakes clearly.
- Be patient with yourself. A self-portrait may take both sessions or more.

Check your work

- ☐ My portrait has correct proportions: eyes halfway, ears between brow and nose.
- ☐ There is a clear light side and shadow side.
- ☐ The features are shaded as forms, not outlined.
- ☐ Someone who knows me can recognize me.

SKETCHBOOK PRACTICE

1. Make three five-minute self-portraits with different expressions: calm, surprised, thinking hard.
2. Draw your self-portrait in three-quarter view, turning your head partly away from the mirror.
3. Draw a family member while they read or work quietly. Focus on proportion more than detail.

From history. Rembrandt's self-portraits form a kind of autobiography in paint. He lived through bankruptcy and the deaths of his wife and his son, and his late self-portraits are admired for their honesty and quiet dignity.

COMMON MISTAKES

- Moving your head between looks. Use the tape marks and return to the same pose.
- Starting with one perfect eye and building the rest of the face around it. Lay in the whole head first.
- Pressing hard too early. Keep everything light until the proportions are checked.

Make it a game • Mirror Reversal Test. Your parent writes your name on paper and holds it up to the mirror. You write what you see, correctly. Then raise your right hand and say which hand the mirror shows. Set a lamp to one side and tell where the shadows fall. Good light and a steady mirror matter.

Scripture. “So God created man in his own image, in the image of God created he him” (Genesis 1:27, KJV)

Every face you draw, including your own, bears the image of God. That is a good reason to draw it with care and truthfulness.

UNIT 2

DRAWING PROPORTION AND PORTRAITS

The human face is the hardest and most rewarding subject an artist can draw. We look at faces all day, so we notice instantly when something is a little off. This unit gives you the tools to get proportion right: **sighting** with a pencil held at arm's length, the classical **proportions of the face**, and the structure of the individual features.

You will study portraits by Raphael, Vermeer, Leonardo and Rembrandt, and finish with a self-portrait drawn from a mirror, the same exercise the masters set themselves again and again. Expect this unit to stretch you. Faces take practice, and every careful attempt teaches your eye something.

PREREQUISITES

- Knows the elements of art, especially line, shape and value (Unit 1)
- Can shade a simple form from light to dark
- Keeps a sketchbook

MASTERY CHECKLIST

- ☐ I can sight-measure with a pencil to compare sizes and find angles.
- ☐ I can place the eyes, nose, mouth and ears in correct proportion on a front-view head.
- ☐ I can draw each facial feature as a form with light and shadow, not as a symbol.
- ☐ I can draw a recognizable self-portrait from a mirror.
- ☐ I can explain how Leonardo, Raphael, Vermeer and Rembrandt made their portraits look alive.

LESSONS IN THIS UNIT

2.1 Sighting and Measuring

2 sessions of 50 minutes

2.2 Proportions of the Face

2 sessions of 50 minutes

2.3 Drawing the Features

2 sessions of 50 minutes

2.4 A Self-Portrait from a Mirror

2 sessions of 50 minutes

UNIT 2 REVIEW

Answer each question. Questions 11 and 12 should be written in complete sentences. You may draw a quick sketch to help explain any answer. 100 points total.

1. (7 pts)

Explain how to sight-measure with a pencil. Include what to do with your arm and eyes.

2. (7 pts)

What is a unit of measure, and why use one?

3. (7 pts)

What is a plumb line, and what can it show you?

4. (7 pts)

On an adult head, where do the eyes sit?

5. (7 pts)

Name the three nearly equal parts of the face.

6. (7 pts)

How wide is the space between the eyes? How wide is the head across the eyes?

7. (7 pts)

Where are the ears placed?

8. (7 pts)

What is the difference between symbol drawing and observational drawing of a feature?

9. (7 pts)

What is sfumato, and which artist is famous for it?

10. (7 pts)

Why does likeness depend more on proportion than on detail?

11. 15 pts

Written answer: Choose either the *Mona Lisa* or *Girl with a Pearl Earring*. In four or five sentences, explain how the artist painted the features and the light to make the face seem alive.

12. 15 pts

Written answer: Describe how you would set up to draw a self-portrait from a mirror, and list the order of steps you would follow.

ANSWER KEY

1. Stretch your arm straight with the elbow locked, close one eye, line the pencil tip up with the top of the object, and slide your thumb to mark the bottom. Use that length to compare other parts.
2. One length (like the height of a mug or a head) used to measure everything else. It keeps all the proportions consistent with each other.
3. A true vertical line (the pencil held straight up and down). It shows which parts line up above or below each other and helps judge angles.
4. About halfway between the top of the head and the bottom of the chin.
5. Hairline to eyebrows; eyebrows to bottom of the nose; bottom of the nose to the chin.
6. About one eye-width between the eyes; the head is about five eyes wide.
7. From about the line of the eyebrows down to the bottom of the nose.
8. Symbol drawing uses a remembered shape (football eye, L nose); observational drawing shows the real shapes of light and shadow you see.
9. Soft, smoky blending of tones with no hard edges; Leonardo da Vinci.
10. We recognize people by the overall shape of the head and the distances between features; if those are wrong, details cannot fix it.
11. Model (Mona Lisa): Leonardo blended the corners of the mouth and eyes into shadow with sfumato, so there is no hard edge and the expression seems to shift. The light falls softly from the left, modeling the forehead, cheeks and chin as rounded forms. There are no outlines, only gradual tones. The misty background repeats the softness. Model (Pearl Earring): Vermeer turned the head over the shoulder so the girl seems caught in a moment; bright highlights on the eyes, lips and pearl against a dark background make the face glow.
12. Model: Put the mirror at eye level where I can see myself by moving only my eyes; light my face from one side; mark the top of my head and chin on the mirror with tape. Then draw the head shape large and light, add the center line and eye line, place nose, mouth, brows and ears with sighting, add hair, neck and shoulders, check proportions, shade the big shadow side, then refine the features and finish the darks and highlights.

PORTFOLIO PIECE: A PORTRAIT OF SOMEONE I LOVE

Draw a finished graphite portrait of a family member or friend from life (or from your own clear photo if they cannot sit long). Light the face from one side. Use sighting and the facial proportions to build the head, draw the features as forms, and include the neck and shoulders. Aim for a true likeness and a clear light side and shadow side.

LOOK FOR	WHAT IT MEANS
Proportion	Features are placed correctly and checked with sighting; the head, neck and shoulders relate well.
Features as forms	Eyes, nose, mouth and ears are shaded with light and shadow, not outlined as symbols.
Light and value	A single light direction is clear, with a full range of values from highlight to dark accents.
Likeness	The sitter is recognizable.
Craftsmanship	Guidelines are erased or absorbed, the paper is clean, and the portrait is signed and dated.

UNIT 3

COLOR: HUE, VALUE AND CHROMA

Most people describe color with one word: “blue,” “brown,” “pink.” Painters need a sharper tool. In 1905 the American painter and teacher Albert Munsell showed that every color can be described by three separate measurements: its **hue** (which color family), its **value** (how light or dark) and its **chroma** (how strong or grayed). Once you can see these three dimensions, color mixing stops being guesswork.

In this unit you will paint with acrylics. You will make a hue-value-chroma chart, paint with a strictly **limited palette** like Whistler and the Swedish painter Anders Zorn, plan **color harmonies** like Van Gogh, and use warm and cool color to show light, air and time of day like Monet and Turner.

PREREQUISITES

- Knows the primary, secondary and tertiary colors and the color wheel
- Can make a value scale in pencil (Unit 1)
- Basic brush handling and cleanup

MASTERY CHECKLIST

- ☐ I can describe any color by its hue, value and chroma.
- ☐ I can lower the chroma of a color by mixing in its complement or gray.
- ☐ I can mix a wide range of colors from a limited palette.
- ☐ I can plan a painting with a complementary, analogous or triadic harmony.
- ☐ I can use warm light and cool shadows to show time of day and atmosphere.

LESSONS IN THIS UNIT

3.1 Munsell's Three Dimensions of Color

2 sessions of 50 minutes

3.2 The Limited Palette

2 sessions of 50 minutes

3.3 Color Harmony

2 sessions of 50 minutes

3.4 Color and Atmosphere

2 sessions of 50 minutes

UNIT 3 REVIEW

Answer each question. Questions 11 and 12 should be written in complete sentences. Have your hue-value-chroma chart nearby. 100 points total.

1. (7 pts)

Name and define Munsell's three dimensions of color.

2. (7 pts)

How can you lower a color's chroma without changing its value much?

3. (7 pts)

Why can a pure yellow never be both dark and strongly yellow?

4. (7 pts)

What four colors make up the Zorn palette?

5. (7 pts)

Give two reasons painters use a limited palette.

6. (7 pts)

What is acrylic paint's binder, and why must acrylic brushes be washed before the paint dries?

7. (7 pts)

Name the complement of blue, of red and of yellow.

8. (7 pts)

What is an analogous color harmony? Give an example.

9. (7 pts)

Explain the rule "warm light, cool shadows."

10. (7 pts)

How do distant hills change in color because of the atmosphere?

11. **15 pts**

Written answer: Explain how Van Gogh used a complementary harmony in *Café Terrace at Night*. Mention dominance, accent and the absence of black.

12. **15 pts**

Written answer: Describe how Turner used warm and cool color in *The Fighting Temeraire* to show time of day and to tell the story.

ANSWER KEY

1. Hue (color family), value (lightness or darkness, 0 to 10), chroma (strength or purity compared with gray).
2. Add a gray of the same value, or a little of its complement.
3. Yellow reaches its strongest chroma at a light value; darkening it (with black or a dark) lowers its chroma and shifts it toward olive green.
4. Yellow ochre, a red (vermilion or cadmium red), ivory black and white.
5. Built-in color harmony (every mix shares the same parents); it trains color mixing; it is simpler and cheaper; it keeps chroma under control.
6. Acrylic polymer emulsion. As the water evaporates the particles fuse into a tough film that no longer dissolves in water, so dried paint ruins brushes.
7. Orange, green, violet (purple).
8. Three or four neighboring colors on the wheel, such as yellow, yellow-orange, orange and red-orange.
9. When the light is warm (sun, lamp), shadows look cool by contrast and because they are lit by the blue sky; with cool light, shadows look warm.
10. They become lighter, cooler (bluer) and lower in chroma, with less contrast.
11. Model: Van Gogh built the painting on the complements yellow-orange and blue. The deep blue night sky and dark buildings cover much of the area, while the yellow lamplight and awning are concentrated around the café as the focal point. Because the complements sit side by side, each makes the other look stronger, so the light glows. He used no black; he made the darks from deep blues, violets and greens, which keeps the night colorful.
12. Model: It is sunset. The right side of the sky blazes with warm oranges and golds from the setting sun, reflected in the river, while the left side is cool blue with a pale moon. The old warship is painted pale and silvery in the cool light, and the small steam tug is dark and warm. The fading sunset suggests the end of the old ship's life and of the age of sail.

PORTFOLIO PIECE: A LIMITED-PALETTE PAINTING WITH A PLANNED HARMONY

Paint a still life or landscape (9×12 in or larger) from life or from your own sketches, using a limited palette of no more than four colors plus white. Plan a color harmony and a dominant color in a thumbnail first. Show a clear light direction with temperature contrast between light and shadow, and save your strongest chroma for the focal point.

LOOK FOR	WHAT IT MEANS
Limited palette	Every color is mixed from four or fewer tubes plus white, listed on the back.
Color harmony	A clear harmony with a dominant color and an accent; the colors feel unified.
Value and chroma control	A full range of values; chroma is lowered in most areas and highest at the focal point.
Light and temperature	Light and shadow have contrasting temperatures and agree on one light direction.
Craftsmanship	Clean edges where needed, even paint, a planned thumbnail attached, signed and dated.

3.1 MUNSELL'S THREE DIMENSIONS OF COLOR

OBJECTIVES

- Define hue, value and chroma and identify each in real colors.
- Judge the value of a color by comparing it with a gray scale.
- Mix a chart that changes one dimension at a time.

Warm-up. Gather five objects of different colors. Put them in order from lightest to darkest. Now take a black-and-white photo of them with a phone (or squint hard). Did you get the order right? Which color fooled you?

WATCH

PAINTING TUTORIAL || Hue, Value, & Chroma: The fundamentals of mixing colours!

Doris Rose Art • 7:55

<https://www.youtube.com/watch?v=OlzYJ7gJgmU>

WHEN TO WATCH

After the core ideas, before the studio project.

Note: She paints in oils; acrylics mix the same way.

BACKUP VIDEO

#Colour for #Artists: Hue, Value and Chroma

Paul Foxtan • 19:49

<https://www.youtube.com/watch?v=d5-fJaZUfhc>

Optional, for students who want to see real Munsell color chips placed in the Munsell student book.

KEY TERMS

hue

The color family: red, yellow-red, yellow, green, blue, purple and so on.

value

How light or dark a color is. Munsell measured it from 0 (black) to 10 (white).

chroma

How strong or pure a color is compared with a gray of the same value; also called intensity or saturation. Low chroma colors are grayed; high chroma colors are vivid.

complement

The color opposite on the color wheel. Mixing a little of a color's complement lowers its chroma.

Munsell system

A way of naming colors by three numbers for hue, value and chroma, devised by Albert H. Munsell.

CORE IDEAS

Think of color as having three separate dials, like the controls of a radio. **Hue** is which station: red, yellow, green, blue, purple, or a step between. Munsell arranged ten main hues around a circle: red, yellow-red, yellow, green-yellow, green, blue-green, blue, purple-blue, purple and red-purple. **Value** is how light or dark the color is, from 0 for pure black to 10 for pure white. **Chroma** is how strong the color is: how far it is from a gray of the same value.

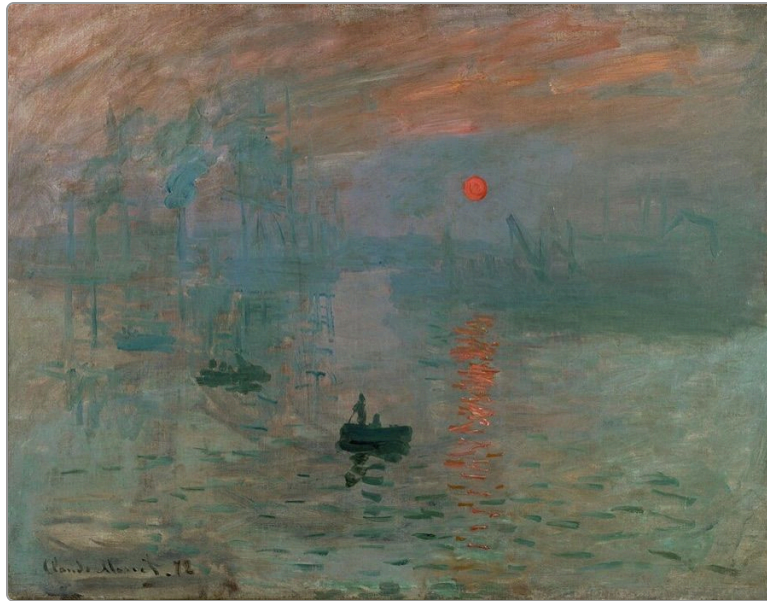
Munsell pictured the colors as a three-dimensional tree. The trunk is a gray scale from black at the bottom to white at the top. The hues are branches reaching out around the trunk. The farther a color is from the trunk, the higher its chroma. A brick red and a fire-engine red have the same hue and might have the same value, but the fire-engine red is much farther from the trunk.

The tree is lopsided, because different hues reach their strongest chroma at different values. The most vivid yellow is very light; the most vivid blue-purple is dark. That is why a pure yellow can never look dark and still be strongly yellow: add black and it turns olive green. Every hue has its own shape.

Each dial can be turned separately. To change **value**, add white (lighter) or a dark color (darker). To lower **chroma** without changing hue much, add a little of the **complement** or a gray of the same value. To change **hue**, add a neighbor on the color wheel. Most mixing mistakes come from turning two dials at once without meaning to: adding white to red, for example, makes pink, which raises the value but also lowers the chroma and cools the hue slightly.

The hardest dial to see is value. A bright orange and a gray-blue can be exactly the same value, so that in a black-and-white photo they disappear into each other. Painters squint, compare colors with a gray scale, and ask over and over: “Is this lighter or darker than that?”

PICTURE STUDY



Impression, Sunrise, Claude Monet, 1872 · Oil on canvas · Musée Marmottan Monet, Paris

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

Monet painted this quick view of the harbor of Le Havre, France, at sunrise. A critic mocked its title and called the painters in Monet's group "Impressionists," and the name stuck. The painting also holds a famous lesson about hue, value and chroma.

Look closely

- Find the sun. What is its hue? Is its chroma high or low compared with the sky?
- Squint hard at the sun and the sky around it. Is the sun much lighter than the sky, or nearly the same value?
- Find the darkest values in the painting. What hue are they?
- Look at the water. Which colors are repeated from the sky?

Talk about it

1. Scientists have measured that the orange sun is almost the same value as the gray sky. Why might this make the sun seem to shimmer?
2. If you photographed this painting in black and white, what would happen to the sun?

3. How do the low-chroma grays make the small orange sun look even stronger?

STUDIO PROJECT

A Hue-Value-Chroma Chart

You will paint a chart that turns one dial at a time, so that you see each dimension of color separately. This chart is a tool you will keep for the rest of the year.

You will need

- Heavy paper or mixed-media paper, 11×14 in
- Acrylic paints: white, black, a red, a yellow, a blue, plus a green and an orange if you have them
- Two brushes (a small flat and a round)
- Palette, water jar, paper towels
- Pencil and ruler
- A gray scale (your pencil value strip from Unit 1)

Steps

1. With pencil and ruler, draw three rows of seven 1-inch squares. Label the rows Value, Chroma and Hue.
2. **Value row:** paint pure red in the middle square. Toward the right, add a little more white for each square (three lighter steps). Toward the left, add a tiny bit of black or dark blue for each square (three darker steps).
3. **Chroma row:** paint pure red at the left end. Mix a gray from black and white that matches red's value (squint to check). For each square to the right, add a little more gray to the red, until the last square is almost gray.
4. Try a second chroma row if you have time: lower red's chroma by adding small amounts of its complement, green, instead of gray. Compare the two rows.
5. **Hue row:** paint red at the left and yellow at the right. Mix steps between them (red-orange, orange, yellow-orange and so on) so that the hue changes but the chroma stays high.
6. Let it dry. Under each row, write which dial changed and which stayed the same.

7. Find three colors in your house (a cushion, a book, a shirt). For each, write a description: hue, light or dark value, high or low chroma.

Tips

- Add dark colors to light ones a tiny bit at a time; dark paint is strong.
- Acrylic dries darker than it looks wet. Test a dab and let it dry before you judge.

Check your work

- ☐ My value row moves from dark to light in even steps.
- ☐ My chroma row moves from vivid red to almost gray without getting lighter or darker.
- ☐ My hue row changes color family smoothly.
- ☐ I can describe a color by its hue, value and chroma.

SKETCHBOOK PRACTICE

1. Cut ten small color swatches from a magazine. Glue them in order of value, then check by squinting.
2. Paint (or color) one apple three times: high chroma, middle chroma, low chroma. Keep the value the same.
3. Find two very different hues in your house that are the same value. Draw them side by side.

From history. Albert H. Munsell taught art in Boston and published *A Color Notation* in 1905. He wanted children to learn color as clearly as they learned music or arithmetic. His system is still used today to match soil colors, paints and even the colors of teeth.

COMMON MISTAKES

- Using only white and black to change everything. Black often dulls and shifts hues; try a dark color instead.
- Confusing value and chroma. A dark color can be vivid (deep blue) and a light color can be dull (pale beige).
- Judging wet acrylic. Let a test dry first.

Make it a game • Three Questions Guessing. Each of you secretly picks a colored item in the room. Take turns asking only questions about hue, value or chroma, such as 'Is its value darker than gray?' The first to name the other's item wins. Say what each of your three answers tells you about Munsell's dimensions of color.

3.2 THE LIMITED PALETTE

OBJECTIVES

- Explain why painters often choose to work with only a few colors.
- Mix a wide range of colors from a three- or four-color palette.
- Paint a still life with the Zorn palette (yellow ochre, red, black and white).

Warm-up. Look at the clothing people are wearing in your house today. If you had only yellow ochre, red, black and white, which of their colors could you mix? Which could you not? Make a quick list.

WATCH

Realistic Skin Tones with Just 4 colours!?!? The Zorn Palette - Colour Mixing Demonstration

Andrew Tischler · 14:20

<https://www.youtube.com/watch?v=QTqpWZtDH9M>

WHEN TO WATCH

Before the studio project. Watch how he lays out yellow ochre, red, black and white and mixes a chart of colors from them; notice the cool “blue-greens” he gets from black and yellow.

Note: He uses the chart to paint skin tones; you will use the same mixtures for a still life. Skip the short shop plug near the start.

BACKUP VIDEO

How to Mix Any Color from a Limited Watercolor Palette

Jackie Hernandez · 10:30

<https://www.youtube.com/watch?v=sg0ynNwSd7o>

Optional, if you are using watercolors instead of acrylics, or want to see a three-primary limited palette.

KEY TERMS

palette

Both the surface you mix paint on and the set of colors an artist chooses for a painting.

Zorn palette

Yellow ochre, a red (vermilion or cadmium red), ivory black and white, named after the Swedish painter Anders Zorn.

color harmony

The feeling that the colors in a picture belong together.

limited palette

A small, deliberately chosen set of colors (often three to five) from which all the colors in a painting are mixed.

earth pigment

A pigment made from colored clay or minerals dug from the ground, such as yellow ochre or burnt umber.

CORE IDEAS

It seems that more colors would make better paintings. Often the opposite is true. When every color in a painting is mixed from the same few tubes, every color shares something with every other, and the picture holds together. This is the main reason painters choose a **limited palette**: built-in harmony. It also forces you to understand mixing, instead of reaching for a new tube every time.

The best-known limited palette is the **Zorn palette**: yellow ochre, a red, black and white. Yellow ochre is an *earth pigment*, iron-rich clay that painters have used since the cave paintings. With these four you can mix warm skin tones, browns, oranges and a full range of grays. There is no blue tube, but black mixed with white looks bluish gray beside warm colors, and black mixed with yellow ochre makes an olive green. Our eyes read these low-chroma “blues” and “greens” as cool because of what surrounds them.

Another common limited palette uses **three primaries** plus white: for example, lemon yellow, magenta and a blue. These can mix almost any hue, though not always at the highest chroma. Many landscape painters use a warm and a cool version of each primary, which is still far fewer than a beginner’s box of twenty-four colors.

A limited palette also teaches **relationships**. A color is never seen alone; it is always seen next to others. A dull gray-blue will look surprisingly blue beside orange. Painters exploit this: they keep most colors low in chroma and save a few higher-chroma touches for where they want the eye to go.

Remember what acrylic paint is: pigment held in a binder of acrylic polymer, tiny plastic particles suspended in water. As the water evaporates, the particles press together into a tough, flexible film that no longer dissolves in water. That is why acrylic dries fast, cannot be rewetted, and must be washed out of brushes before it dries.

PICTURE STUDY



Arrangement in Grey and Black No. 1 (Whistler's Mother), James McNeill Whistler, 1871 · Oil on canvas ·
Musée d'Orsay, Paris

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

The American painter James McNeill Whistler painted his mother, Anna, sitting in his London home. He titled it as a musician might title a piece, *Arrangement in Grey and Black*, because he wanted people to notice how it was designed with very few colors.

Look closely

- List every color you can find. How many are there really?
- Find the brightest, lightest areas. What are they?
- Look at the curtain on the left. How does its pattern add interest without adding new colors?
- Notice the shapes: the rectangle of the picture frame, the long black shape of the dress.

Talk about it

1. Why do you think Whistler chose such a quiet, limited set of colors for a portrait of his mother?
2. Does the painting feel peaceful or restless? What in the colors makes you feel that way?

3. Whistler said this painting was an “arrangement.” What do you think he meant?

STUDIO PROJECT

A Zorn Palette Still Life

You will first paint a small chart of all the colors you can mix from the Zorn palette, then paint a simple still life using only those four colors. You will be surprised how much color appears.

You will need

- Acrylic paints: yellow ochre, a red (cadmium red or naphthol red), black, titanium white
- Mixed-media or canvas paper, 9×12 in, plus a scrap sheet for the chart
- Brushes: ½ in flat, #8 round, #4 round
- Palette, water jar, paper towels, spray bottle
- Still life: an orange or apple, a brown bread roll or potato, a white cup, on a plain cloth
- A lamp for side light

Steps

1. On scrap paper, make a mixing chart: put each of the four colors across the top and down the side, and in each square mix the two colors together. Then add white to each mix.
2. Find on your chart: a skin tone, a brown, an orange, an olive green, and a bluish gray. Label them.
3. Set up your still life with light from one side. Sketch it lightly in pencil on your painting paper. Keep it simple: three objects and a tabletop edge.
4. Mix a middle-value, low-chroma color for the background and paint it in with the flat brush.
5. Paint the shadow side of each object first with darker mixes, then the light side with lighter, warmer mixes.
6. Paint the cast shadows on the table with a cool gray (black, white and a touch of red).
7. Save your strongest chroma (purest red and ochre mixed) for the orange or apple, so it becomes your focal point.

8. Add the highlights last with white and a touch of yellow ochre.
9. When dry, write on the back: “Zorn palette: yellow ochre, red, black, white.”

Tips

- Mist your palette with water every few minutes so the acrylic stays workable.
- Mix piles of paint, not dabs. Running out halfway makes it hard to match.

Check your work

- ☐ I used only four colors.
- ☐ My chart shows at least twelve different mixtures.
- ☐ My still life has a clear light side and shadow side on each object.
- ☐ The colors feel harmonious, and the focal point has the strongest chroma.

SKETCHBOOK PRACTICE

1. Using only three colored pencils (one red, one yellow, one blue) plus the white of the paper, color a small landscape.
2. Make a color study of the Whistler painting using only black, white and one brown.
3. Choose a painting from Unit 1 and list the colors you think the artist could have mixed it from.

From history. Anders Zorn (1860–1920) was a Swedish painter famous for portraits and scenes of country life. Painters have long called his four-color set “the Zorn palette,” although he sometimes added other colors. Long before him, the ancient Greeks were said to have painted with four colors: white, yellow ochre, red earth and black.

COMMON MISTAKES

- Using black straight from the tube for shadows. Mix it with red or ochre so it stays alive.
- Making every mixture high in chroma. Low-chroma colors make the few strong ones shine.
- Letting acrylic dry in the brush. Rinse often and wash brushes with soap at the end.

Make it a game • Four-Color Challenge. Choose just three or four crayons or colored pencils. Set a timer for three minutes. Layer and blend them to make as many different colors as you can, labeling each recipe. Your parent counts the distinct colors. Then say why a painter like Zorn would choose so few. Beat your count next round.

3.3 COLOR HARMONY

OBJECTIVES

- Identify complementary, analogous, triadic and split-complementary harmonies on the color wheel.
- Explain how contrast of complements makes colors look stronger.
- Plan and paint a small picture with a chosen color harmony.

Warm-up. Stare at a bright red square of paper for 30 seconds, then look at a white wall. What color do you see? This afterimage is your eye showing you red's complement.

WATCH

COLOR THEORY BASICS: Use the Color Wheel & Color Harmonies to Choose Colors that Work Well Together

[Sarah Renae Clark](#) · 6:58

<https://www.youtube.com/watch?v=Yel6Wqn4I78>

WHEN TO WATCH

After the core ideas. Pause at each harmony and find it on your own color wheel.

BACKUP VIDEO

Colour Harmony - 10 Minutes To Better Painting - Episode 5

[Marco Bucci](#) · 10:21

<https://www.youtube.com/watch?v=4LhcNbFMkTw>

Optional, for a painter's view of harmony: how one color of light can tie a whole picture together.

KEY TERMS

complementary colors

Colors opposite each other on the wheel, such as blue and orange. Side by side they intensify each other; mixed they gray each other.

analogous colors

Three or four colors next to each other on the wheel, such as yellow, yellow-green and green.

triad

Three colors evenly spaced around the wheel, such as red, yellow and blue.

split complementary

One color plus the two colors on either side of its complement, such as blue with yellow-orange and red-orange.

dominant color

The color that covers the most area and sets the overall mood.

CORE IDEAS

A **color harmony** is a planned set of colors that work together, the way a few notes form a chord. The color wheel shows the simplest harmonies as shapes: a straight line across the wheel (**complementary**), a slice of neighbors (**analogous**), an even triangle (**triadic**), or a narrow Y (**split complementary**).

Complementary colors are opposites: red and green, blue and orange, yellow and violet. Side by side, each makes the other look stronger, because the eye tires of one and expects the other (that is the afterimage you saw in the warm-up). Mixed together, they cancel toward gray or brown. Painters use both facts: complements next to each other for excitement, and complements mixed in to quiet a color.

Analogous colors are neighbors, and they feel calm and unified, like the oranges, golds and reds of autumn trees. **Triads** are lively and balanced. A **split complementary** scheme gives the punch of complements with a little more variety.

A harmony is not just a choice of hues; it is also a choice of **proportion**. A picture that is half orange and half blue at full chroma feels like a flag and fights itself. A picture that is mostly blue, with orange in a small area, feels designed. Choose a **dominant** color for most of the area, a secondary one, and an accent used sparingly, often at the focal point.

Harmony also comes from **value and chroma**. Even a wild set of hues can harmonize if most are kept at low chroma or in a narrow value range. That is why the limited palette of the last lesson works so well.

PICTURE STUDY



Café Terrace at Night, Vincent van Gogh, 1888 · Oil on canvas · Kröller-Müller Museum, Otterlo, Netherlands

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

Van Gogh painted this café in Arles, in the south of France, on the spot at night. In a letter to his sister he said it was a night picture painted without any black, using only blues, violets and greens for the dark. It is a clear example of a complementary harmony.

Look closely

- Find the two main hues. Where are they on the color wheel?
- Which color covers more area? Which is the accent?
- Look at the stars. What color are they, and what color surrounds them?
- Find the cobblestones. How did Van Gogh mix the two main colors there?

Talk about it

1. Why do the yellow lights seem to glow so strongly?
2. Van Gogh used no black. How did he still make the night feel dark?
3. How would the painting feel if the sky were gray instead of deep blue?

STUDIO PROJECT

One Scene, Two Harmonies

You will paint the same simple scene twice, once with a complementary harmony and once with an analogous harmony, to see how much color choice changes the feeling of a picture.

You will need

- Mixed-media or watercolor paper, two pieces about 6×8 in
- Acrylic paints (three primaries and white) or watercolors
- Brushes, palette, water, paper towels
- Pencil
- Color wheel from Unit 1 or 3.1

Steps

1. Choose a simple scene: a house with a lit window at dusk, a sailboat on water, or a tree on a hill under a sky.
2. Draw the same simple outline lightly on both papers.
3. On a scrap, plan picture A with a **complementary** harmony (for example blue and orange). Decide which will be dominant and which will be the accent.
4. Plan picture B with an **analogous** harmony (for example yellow, yellow-orange, orange and red-orange).
5. Paint picture A. Cover most of the area with the dominant color in several values and chromas. Use the accent color in a small area at the focal point at its strongest chroma.
6. Mix a little of each complement into the other to make grays and browns for any neutral areas.
7. Paint picture B. Use the analogous colors in different values so the picture has strong lights and darks.
8. Mount the two side by side and write a title for each that describes its mood.

Tips

- Let one color win. Equal amounts of two strong colors fight each other.
- Lower the chroma of most of the picture; save the strongest color for the focal point.

Check your work

- ☐ Picture A uses a complementary harmony with a clear dominant color and accent.
- ☐ Picture B uses three or four neighbors on the color wheel.
- ☐ Both pictures have a range of values from light to dark.
- ☐ I can explain how the mood differs between the two.

SKETCHBOOK PRACTICE

1. Draw a color wheel and mark one complementary pair, one analogous set and one triad.
2. Find a painting or photo you love and make a small strip of its five main colors. Which harmony is it closest to?
3. Color the same small leaf three times: complementary, analogous, triadic.

From history. Van Gogh studied color theory carefully, especially the ideas of the French chemist Michel Eugène Chevreul, who explained in 1839 how colors change each other when placed side by side. Chevreul worked at a tapestry factory and noticed that dyed threads looked different depending on their neighbors.

COMMON MISTAKES

- Using complements in equal amounts at full strength. Choose a dominant color.
- Forgetting value. Colors in a harmony still need lights and darks.
- Mixing complements and wondering why the color turned to mud. That is what complements do when mixed.

Make it a game • Harmony on Call. Lay out colored pencils in wheel order. Your parent calls a harmony and a base color, such as 'triadic from yellow.' Grab the correct pencils in ten seconds and name the harmony. Include complementary, analogous and split-complementary. Then say which color should dominate. Switch roles.

Scripture. “He hath made every thing beautiful in his time” (Ecclesiastes 3:11, KJV)

The colors of sunrise, autumn and evening sky change through the day and the year. Harmony in painting is a small echo of the order God built into the world.

3.4 COLOR AND ATMOSPHERE

OBJECTIVES

- Explain color temperature and the rule of warm light with cool shadows (and the reverse).
- Describe how the color of light changes with time of day and weather.
- Paint a sky and landscape that shows a particular time of day.

Warm-up. Look out the same window now and, if you can, again at sunset. In your sketchbook, list the colors of the sky, the ground and the shadows each time. How did they change?

WATCH

Finding the Color in the Shadows.

Ian Roberts · 13:48

<https://www.youtube.com/watch?v=MSYi0r2k3go>

WHEN TO WATCH

After the core ideas, before the picture study. Listen for how the color of the light changes the color of the shadows, then watch him paint it.

BACKUP VIDEO

Oil painting step by step tutorial: creating depth with color

Paint Coach · 13:02

<https://www.youtube.com/watch?v=8K3KtRiaA>

Optional, a longer step-by-step painting showing how colors cool and gray as they recede.

KEY TERMS

color temperature

Whether a color feels warm (toward red, orange, yellow) or cool (toward blue, green, violet).

atmosphere

The air, with its moisture and dust, that lies between us and everything we see; in art, also the overall mood of light and air.

local color

The color an object has in plain daylight, such as the green of a leaf, before light and air change it.

warm light, cool shadow

When light is warm (sunlight, a lamp), shadows tend to look cool, and when light is cool (overcast sky, north light), shadows tend to look warm.

CORE IDEAS

Every color you see is changed by the light falling on it and the air it passes through. An object's **local color** (a red barn) looks orange-red at sunset, gray-violet at dusk, and pale blue-gray through morning fog. Painters who paint only the local color make pictures that look cut out and pasted. Painters who paint the light make pictures that breathe.

Colors have **temperature**. Reds, oranges and yellows feel warm; blues, greens and violets feel cool. Temperature is relative: a red-violet is cool next to orange but warm next to blue. Sunlight, especially early and late in the day, is warm, and the blue sky fills shadows with cool light. So outdoors on a sunny day you get the painter's rule: **warm light, cool shadows**.

The **time of day** changes everything. At noon the light is white and high, shadows are short, and colors are strong. In the early morning and late afternoon the light is low and golden, shadows are long and blue, and everything glows. On an overcast day the light is cool and even, shadows are soft, and colors are quiet. Turner and Monet made whole careers out of painting these changes.

Air itself has color. Water droplets and dust scatter blue light, so distant hills look bluer, lighter and less vivid than near ones, and a sunset sky glows orange near the sun and fades to blue overhead. You will study this as atmospheric perspective in Unit 6. For now, notice that a painting's sky color quietly appears in everything below it: the water, the shadows, the tops of things facing upward.

To paint atmosphere, decide on the light first. Choose a dominant temperature for the light (warm or cool), make the shadows the opposite, and let the sky color tint the whole landscape.

PICTURE STUDY



The Fighting Temeraire, J. M. W. Turner, 1839 · Oil on canvas · National Gallery, London

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

Turner watched an old sailing warship, the *Temeraire*, being towed up the River Thames to be taken apart, after a long and honorable career. He painted the scene as a farewell at sunset. The painting is a study in warm and cool light.

Look closely

- Divide the painting down the middle. What is the temperature of the left side? Of the right?
- Look at the old ship. What color is it? How does it compare with the little tug?
- Find the sun and its reflection. How did Turner make it glow?
- Find the thin moon in the cool part of the sky.

Talk about it

1. Why do you think Turner painted the old ship so pale and the new steam tug so dark?
2. What time of day is it? What feeling does that time of day give the story?
3. How does the sky's color appear in the water?

STUDIO PROJECT

A Sky at a Chosen Hour

You will paint a simple landscape (sky, distant hills, a near field and one tree or building) at a particular time of day, using color temperature to show the light and the atmosphere.

You will need

- Mixed-media or canvas paper, 9×12 in
- Acrylic paints: white, a warm and cool yellow, a warm and cool red, ultramarine and phthalo blue (or the primaries you have)
- Brushes: ½ in flat, #8 round
- Palette, water, paper towels, spray bottle
- Pencil

Steps

1. Choose your hour: early morning mist, bright noon, golden late afternoon, or sunset.
2. Lightly draw a low horizon line (about one-third up the page), a line of distant hills, and one tree or small building in the middle ground.
3. Decide the temperature of your light (warm for late afternoon and sunset, cool for mist and overcast) and write it in a corner.
4. Paint the sky first, from top to bottom. For a sunset, blend from blue at the top through violet or soft gray to orange and yellow near the horizon. For noon, a stronger blue at the top fading lighter near the horizon.
5. Paint the distant hills with a mix of the sky color and a little of the hill's local color: lighter, cooler and grayer than you think.
6. Paint the middle and near ground, getting warmer, darker and stronger in chroma as you come forward.
7. Paint the tree or building. Light it on the side facing the sun with a warm color, and give it a shadow side and a cast shadow in a cool color.
8. Add small touches of the sky color on the ground plane (puddles, the tops of grass) to tie the picture together.

Tips

- Paint the sky in one sitting so you can blend while it is wet; mist it with water to slow drying.
- Distant things are almost never as dark or as green as they seem to be. Compare them with the sky.

Check your work

- ☐ My painting clearly shows one time of day.
- ☐ The light and shadow have opposite temperatures.
- ☐ Distant hills are lighter, cooler and duller than near ground.
- ☐ The sky color appears somewhere in the land.

SKETCHBOOK PRACTICE

1. Make four tiny (2×3 in) color sketches of the same view at four times of day.
2. Draw a white object (an egg or cup) in sunlight and color its shadow. What color is it really?
3. Find a photograph of a sunset and make a color strip from top to bottom of the sky.

From history. Turner was fascinated by light all his life and often painted the sun itself, which few painters dared to try. He kept *The Fighting Temeraire* for himself and called it his “darling.” In 2005 listeners to a BBC radio program voted *The Fighting Temeraire* the greatest painting in any British collection.

COMMON MISTAKES

- Painting every shadow with gray or black. Outdoors, shadows are usually cool and colored.
- Making distant hills as dark and green as near trees.
- Painting the sky one flat blue. The sky changes color and value from top to horizon.

Make it a game • Name That Hour. Your parent reads clues for the color of the light. 'Long orange light, with blue shadows' might be a sunset. Name the time of day or weather and whether the light is warm or cool. Then you write three riddles of your own. Remember the rule: warm light means cool shadows.

UNIT 3

COLOR: HUE, VALUE AND CHROMA

Most people describe color with one word: “blue,” “brown,” “pink.” Painters need a sharper tool. In 1905 the American painter and teacher Albert Munsell showed that every color can be described by three separate measurements: its **hue** (which color family), its **value** (how light or dark) and its **chroma** (how strong or grayed). Once you can see these three dimensions, color mixing stops being guesswork.

In this unit you will paint with acrylics. You will make a hue-value-chroma chart, paint with a strictly **limited palette** like Whistler and the Swedish painter Anders Zorn, plan **color harmonies** like Van Gogh, and use warm and cool color to show light, air and time of day like Monet and Turner.

PREREQUISITES

- Knows the primary, secondary and tertiary colors and the color wheel
- Can make a value scale in pencil (Unit 1)
- Basic brush handling and cleanup

MASTERY CHECKLIST

- ☐ I can describe any color by its hue, value and chroma.
- ☐ I can lower the chroma of a color by mixing in its complement or gray.
- ☐ I can mix a wide range of colors from a limited palette.
- ☐ I can plan a painting with a complementary, analogous or triadic harmony.
- ☐ I can use warm light and cool shadows to show time of day and atmosphere.

LESSONS IN THIS UNIT

3.1 Munsell's Three Dimensions of Color

2 sessions of 50 minutes

3.2 The Limited Palette

2 sessions of 50 minutes

3.3 Color Harmony

2 sessions of 50 minutes

3.4 Color and Atmosphere

2 sessions of 50 minutes

UNIT 3 REVIEW

Answer each question. Questions 11 and 12 should be written in complete sentences. Have your hue-value-chroma chart nearby. 100 points total.

1. (7 pts)

Name and define Munsell's three dimensions of color.

2. (7 pts)

How can you lower a color's chroma without changing its value much?

3. (7 pts)

Why can a pure yellow never be both dark and strongly yellow?

4. (7 pts)

What four colors make up the Zorn palette?

5. (7 pts)

Give two reasons painters use a limited palette.

6. (7 pts)

What is acrylic paint's binder, and why must acrylic brushes be washed before the paint dries?

7. (7 pts)

Name the complement of blue, of red and of yellow.

8. (7 pts)

What is an analogous color harmony? Give an example.

9. (7 pts)

Explain the rule "warm light, cool shadows."

10. (7 pts)

How do distant hills change in color because of the atmosphere?

11. **15 pts**

Written answer: Explain how Van Gogh used a complementary harmony in *Café Terrace at Night*. Mention dominance, accent and the absence of black.

12. **15 pts**

Written answer: Describe how Turner used warm and cool color in *The Fighting Temeraire* to show time of day and to tell the story.

ANSWER KEY

1. Hue (color family), value (lightness or darkness, 0 to 10), chroma (strength or purity compared with gray).
2. Add a gray of the same value, or a little of its complement.
3. Yellow reaches its strongest chroma at a light value; darkening it (with black or a dark) lowers its chroma and shifts it toward olive green.
4. Yellow ochre, a red (vermilion or cadmium red), ivory black and white.
5. Built-in color harmony (every mix shares the same parents); it trains color mixing; it is simpler and cheaper; it keeps chroma under control.
6. Acrylic polymer emulsion. As the water evaporates the particles fuse into a tough film that no longer dissolves in water, so dried paint ruins brushes.
7. Orange, green, violet (purple).
8. Three or four neighboring colors on the wheel, such as yellow, yellow-orange, orange and red-orange.
9. When the light is warm (sun, lamp), shadows look cool by contrast and because they are lit by the blue sky; with cool light, shadows look warm.
10. They become lighter, cooler (bluer) and lower in chroma, with less contrast.
11. Model: Van Gogh built the painting on the complements yellow-orange and blue. The deep blue night sky and dark buildings cover much of the area, while the yellow lamplight and awning are concentrated around the café as the focal point. Because the complements sit side by side, each makes the other look stronger, so the light glows. He used no black; he made the darks from deep blues, violets and greens, which keeps the night colorful.
12. Model: It is sunset. The right side of the sky blazes with warm oranges and golds from the setting sun, reflected in the river, while the left side is cool blue with a pale moon. The old warship is painted pale and silvery in the cool light, and the small steam tug is dark and warm. The fading sunset suggests the end of the old ship's life and of the age of sail.

PORTFOLIO PIECE: A LIMITED-PALETTE PAINTING WITH A PLANNED HARMONY

Paint a still life or landscape (9×12 in or larger) from life or from your own sketches, using a limited palette of no more than four colors plus white. Plan a color harmony and a dominant color in a thumbnail first. Show a clear light direction with temperature contrast between light and shadow, and save your strongest chroma for the focal point.

LOOK FOR	WHAT IT MEANS
Limited palette	Every color is mixed from four or fewer tubes plus white, listed on the back.
Color harmony	A clear harmony with a dominant color and an accent; the colors feel unified.
Value and chroma control	A full range of values; chroma is lowered in most areas and highest at the focal point.
Light and temperature	Light and shadow have contrasting temperatures and agree on one light direction.
Craftsmanship	Clean edges where needed, even paint, a planned thumbnail attached, signed and dated.

UNIT 4

LIGHT: CHIAROSCURO

Chiaroscuro (kee-AR-oh-SKOOR-oh) is Italian for “light-dark.” It names the art of using light and shadow to make flat paper look solid and to give a picture drama and focus. In this unit you will learn the parts of light on a form (highlight, halftone, core shadow, reflected light, cast shadow), render them in graphite and in charcoal, and study the masters who pushed light and dark to its limits: Caravaggio, Rembrandt and Georges de La Tour.

Your most important tool this unit is not a pencil but a lamp. A single strong light in a dim room makes the shapes of light and shadow clear and simple. Once you can see them, you can draw anything that light falls on.

PREREQUISITES

- Can make a smooth value scale from white to black (Units 1 and 3)
- Can sight-measure proportions (Unit 2)
- Has HB–6B pencils, vine and compressed charcoal, and a kneaded eraser

MASTERY CHECKLIST

- ☐ I can name and find the highlight, halftone, core shadow, reflected light and cast shadow on a form.
- ☐ I can render a sphere, cube and cylinder in graphite with a consistent light source.
- ☐ I can tone paper with charcoal and lift out lights with an eraser.
- ☐ I can explain the difference between chiaroscuro and tenebrism.
- ☐ I can draw a still life lit by one strong light, with dramatic contrast.

LESSONS IN THIS UNIT

4.1 Rendering Form in Graphite

2 sessions of 50 minutes

4.2 Drawing in Charcoal: Massing Light and Dark

2 sessions of 50 minutes

4.3 Chiaroscuro and Tenebrism

2 sessions of 50 minutes

4.4 Drawing by Candlelight-Like Light

2 sessions of 50 minutes

UNIT 4 REVIEW

Answer each question. Questions 11 and 12 should be written in complete sentences. You may make a sketch to help answer any question. 100 points total.

1. (7 pts)

Name the five parts of light and shadow on a sphere, from lightest to the cast shadow.

2. (7 pts)

Where is the core shadow, and why is it the darkest part on the form?

3. (7 pts)

Why should reflected light never be as bright as the lit side?

4. (7 pts)

How is the light on a cube different from the light on a sphere?

5. (7 pts)

Why should you build dark graphite tones with soft pencils instead of pressing hard with a hard pencil?

6. (7 pts)

What is the reductive method in charcoal?

7. (7 pts)

What does massing mean?

8. (7 pts)

What is the difference between chiaroscuro and tenebrism?

9. (7 pts)

Name the Italian painter most associated with tenebrism and one painter he influenced.

10. (7 pts)

How do shadows from a candle differ from shadows in sunlight?

11. 15 pts

Written answer: Describe how Caravaggio uses light in *Supper at Emmaus* to tell the story of the disciples' recognition.

12. 15 pts

Written answer: Explain how Georges de La Tour shows a small, close light in *Joseph the Carpenter*. Mention falloff and translucency.

ANSWER KEY

1. Highlight, halftone, core shadow, reflected light, cast shadow.
2. Where the form turns away from the light; it gets no direct light and little reflected light.
3. It is weak bounced light inside the shadow family; making it too bright makes the form look hollow or glassy.
4. A cube has flat planes, each a fairly even value with crisp edges; a sphere changes gradually in all directions.
5. Pressing hard polishes the paper and makes a shiny tone that will not darken; soft pencils give darker tone without damage.
6. Tone the paper with charcoal first, then lift out the lights with an eraser and add the darks.
7. Drawing the large shapes of light and shadow first instead of starting with outlines and details.
8. Chiaroscuro is strong use of light and dark to model form; tenebrism is an extreme kind, with most of the picture in deep darkness and a few areas spotlighted.
9. Caravaggio; influenced Georges de La Tour, Ribera, Velázquez, Rembrandt and others.
10. Candle shadows spread outward and grow larger with distance and the light falls off quickly; sunlight shadows are nearly parallel and the light is even.
11. Model: A strong light from the upper left strikes Christ's face and blessing hand and the startled disciples against a dark background, like a sudden revelation. The darkness removes distractions, and the bright light on the outstretched hands and the basket teetering at the table's edge pushes the scene out toward us. The innkeeper's shadow falls on the wall behind Christ, making His lit face stand out. The light shows the moment the disciples' eyes are opened.
12. Model: The candle held by the boy Jesus is the brightest point. The faces and hands nearest it are brightly lit, while the light falls off quickly so Joseph's back and the workshop sink into darkness. The light glows red-orange through the boy's fingers, showing translucency. Edges far from the flame are lost in shadow, giving a quiet, reverent mood.

PORTFOLIO PIECE: A CHIAROSCURO STILL LIFE

Arrange a still life of three to five objects with different forms and surfaces (something round, something boxy, something shiny, something cloth). Light it with one strong lamp in a dark room. Make a finished drawing in charcoal or graphite, 11×14 in or larger, with dramatic chiaroscuro: deep darks, a clear focal point lit most brightly, and all five parts of light shown on at least one object.

LOOK FOR	WHAT IT MEANS
Single light source	All highlights and shadows agree on one light direction.
Parts of light	Highlight, halftone, core shadow, reflected light and cast shadow are clearly shown.
Value range and drama	A full range from white to deep black, with strong contrast at the focal point.
Edges	Sharp and soft edges are used on purpose; some edges are lost in shadow.
Craftsmanship	Tone is built evenly, the paper is clean outside the drawing, and the work is signed and dated.

4.1 RENDERING FORM IN GRAPHITE

OBJECTIVES

- Identify the parts of light and shadow on a form.
- Render a sphere, cube and cylinder in graphite with one consistent light source.
- Build smooth tone in layers from light to dark.

Warm-up. Make a nine-step value scale: nine 1-inch boxes in a row, from the white of the paper to the darkest your 6B pencil can make. Use the HB for the light steps, 2B for the middle, 4B and 6B for the darks.

WATCH

How to Shade Basic Forms - Pencil Tutorial

Drawing & Painting - The Virtual Instructor • 9:20

<https://www.youtube.com/watch?v=vMr6eimcolc>

WHEN TO WATCH

After the core ideas. Pause when he finishes each form and name its parts of light aloud.

BACKUP VIDEO

How to Draw a 3D Sphere: Shading for Beginners

Circle Line Art School • 4:00

<https://www.youtube.com/watch?v=9r2SIYXQNgl>

Optional, a short, clear sphere demonstration to draw along with.

KEY TERMS

highlight

The brightest spot, where the light reflects most directly toward your eye.

halftone

The middle values on the lit side, where the form turns gradually away from the light.

core shadow

The darkest band of shadow on the form itself, just where it turns away from the light. Also called the terminator.

reflected light

Light bounced back into the shadow side from nearby surfaces; it is always darker than any part of the lit side.

cast shadow

The shadow an object throws onto another surface; darkest and sharpest right where the object touches.

CORE IDEAS

Light behaves the same way on every rounded form, which is why artists practice on simple shapes. Picture a white ball under a lamp. Where the surface faces the lamp squarely, it is lightest, with a small **highlight**. As the surface turns away, the tone darkens through the **halftones**. At the line where the light can no longer reach, the **core shadow** forms, the darkest part of the ball itself. Past the core shadow, the shadow side lightens a little from **reflected light** bouncing up from the table. And on the table lies the **cast shadow**, darkest right under the ball (the *occlusion shadow*, where no light at all can reach) and softer and lighter as it stretches away.

The most important division is between the **light family** (highlight and halftones) and the **shadow family** (core shadow, reflected light, cast shadow). Every value in the light family must be lighter than every value in the shadow family. Beginners often make reflected light too bright, which makes the form look hollow or glassy. Keep it subtle.

Different forms show light differently. A **sphere** changes gradually in every direction. A **cube** has flat planes, so each face is one fairly even value: the face toward the light is lightest, the other faces are darker, with crisp edges between them. A **cylinder** changes gradually around its curve but stays even along its length, so its tones run in bands.

Build graphite tone in **layers**. Start with a light, even tone with an HB pencil over the whole shadow family, then add darker layers with softer pencils (2B, 4B, 6B). Keep the strokes close together and follow the form or keep them in one direction. Pressing hard with a hard pencil polishes the paper and makes a shiny tone that will

not darken further. Use a blending stump sparingly to smooth, and a kneaded eraser to lift the highlight.

Everything you will ever draw is made of these basic forms or combinations of them: a head is roughly a sphere, an arm a cylinder, a house a set of cubes. Master the light on these, and you have the key to drawing anything.

PICTURE STUDY



Still Life with Lemons, Oranges and a Rose, Francisco de Zurbarán, 1633 · Oil on canvas · Norton Simon Museum, Pasadena, California

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

Zurbarán was a Spanish painter, mostly of saints and monks, who made only a few still lifes. This one is famous for its stillness and for light so clear that each object seems to stand in a holy quiet. Some see it as a silent offering to the Virgin Mary: water, blossoms and a rose are old symbols of purity and love.

Look closely

- Find the light source. Which way do the shadows fall?
- On one orange, find the highlight, the halftone, the core shadow and the reflected light.
- Look at the cup. Where are its brightest highlights? How do they show that it is shiny?
- Look at the cast shadows on the table. Where are they darkest?

Talk about it

1. Why do you think Zurbarán used a completely black background?
2. The three groups are lined up in a row, almost like a shelf in a church. How does that arrangement change the mood?
3. Which object looks the most solid and real to you? Why?

STUDIO PROJECT

Three Forms in One Light

You will set up real objects (a ball, a box and a can or tube) under a single lamp and render them in graphite, showing every part of light and shadow.

You will need

- Drawing paper, 11×14 in
- Graphite pencils: HB, 2B, 4B, 6B
- Kneaded eraser
- Blending stump
- A white or light-colored ball (or an egg), a small box, and a can or cardboard tube (wrapped in white paper if it has a label)
- A desk lamp
- A white sheet of paper or cloth under the objects

Steps

1. Put the objects on the white paper. Darken the room and light them from one side and a little above with the lamp, about 2 feet away.
2. Sight-measure and lightly draw the three objects with the HB, including their cast shadows. Draw the cast shadow shapes carefully; they are as important as the objects.
3. Squint. Lightly outline the edge between the light family and shadow family on each object.
4. Fill all the shadow areas (on the objects and the cast shadows) with one even, light layer of HB tone.
5. Darken the core shadows with the 2B, then 4B, keeping them softest on the ball and sharpest on the box's edges.
6. Leave the reflected light in the shadow side a little lighter than the core shadow, but still clearly in shadow.
7. Darken the cast shadows: darkest right where each object touches the table, lighter and softer farther away.

8. Add halftones on the lit side, leaving the paper white for the highlights. Lift highlights again with the kneaded eraser if needed.
9. Step back, squint, and check: is every shadow value darker than every light value?

Tips

- Turn off other lights; two light sources make confusing double shadows.
- Build darks slowly with soft pencils instead of pressing hard with a hard one.

Check your work

- ☐ All three forms are lit from the same direction.
- ☐ I can point to the highlight, halftone, core shadow, reflected light and cast shadow.
- ☐ The reflected light stays darker than the lit side.
- ☐ The cast shadows are darkest where the objects touch the table.

SKETCHBOOK PRACTICE

1. Draw an egg under a lamp three times, moving the lamp each time (side, top, low and behind).
2. Shade a cone and a pyramid. How is the light on a cone like a cylinder and like a cube?
3. Draw your closed fist as a combination of simple forms, then shade it.

From history. Zurbarán spent most of his career painting for monasteries in Seville. His saints and monks are lit by the same clear, sharp light as these lemons, standing out against dark backgrounds.

COMMON MISTAKES

- Drawing an outline and then shading around the inside edge like a ring. Shade according to the light, not the outline.
- Making reflected light as bright as the lit side.
- Forgetting the dark accent where the object touches the table, so it seems to float.

Make it a game • Light Ladder Cards. Write five parts of light on slips: highlight, halftone, core shadow, reflected light and cast shadow. Shuffle them, then place them in order across a drawn sphere from the light side to the shadow. Time yourself. Then explain why the reflected light never gets as bright as the highlight.

4.2 DRAWING IN CHARCOAL: MASSING LIGHT AND DARK

OBJECTIVES

- Use vine and compressed charcoal to create broad areas of tone quickly.
- Draw by massing big shapes of light and dark instead of starting with outlines.
- Use the reductive method: tone the paper, then lift out the lights.

Warm-up. On a scrap of paper, rub vine charcoal on its side to make a patch of middle gray. Use a kneaded eraser to “draw” a white shape inside it. Then use compressed charcoal to add one dark shape beside it. Three values in two minutes.

WATCH

How to Draw Basic Forms with Charcoal

Drawing & Painting - The Virtual Instructor • 12:08

<https://www.youtube.com/watch?v=nGsPwzBNY5I>

WHEN TO WATCH

Before the studio project. Watch how differently charcoal handles from graphite.

BACKUP VIDEO

Reductive Charcoal Drawing

nobriga • 5:55

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

Watch just before you start the project; it shows the reductive method you will use.

KEY TERMS

massing

Drawing large shapes of tone first (the big shapes of shadow and light) rather than starting with outlines and details.

toned ground

Paper covered with an even middle value before drawing begins.

reductive drawing

Covering the paper with tone first and then removing (lifting) the lights with an eraser.

vine charcoal

Light, soft sticks of charred vine or willow that make gray marks and erase easily.

compressed charcoal

Powdered charcoal pressed with a binder into dense sticks that make rich black marks.

CORE IDEAS

Graphite is perfect for small, careful work. **Charcoal** is made for big, bold shapes of light and dark. It covers large areas fast, makes deep blacks that graphite cannot match (graphite turns shiny when it is dark), and can be smudged, lifted and redrawn easily. For centuries artists have used it for planning paintings and for studies of light. You will learn more about how it is made in Unit 5.

Charcoal invites a different way of drawing called **massing**. Instead of outlining everything and filling it in, you look for the big shapes of tone: “That whole area is in shadow. That area is light.” You lay them in with the side of the stick, then refine. Squinting helps: it blurs details and shows you the masses. A drawing massed this way looks lit and solid even when it is unfinished.

The **reductive method** starts with a **toned ground**. You cover the whole paper with a middle gray of vine charcoal and smooth it with a paper towel. Now the paper is a halftone. You lift out the light shapes with a kneaded eraser, add the dark shapes with compressed charcoal, and the picture appears from the middle outward. Working from the middle value saves time and keeps the values unified.

Charcoal is fragile. It sits on the surface of the paper, held by the paper’s texture, with very little binder to glue it down. Keep your hand off the drawing (rest it on a clean sheet), never blow the dust (tap the board over a trash can instead), and protect finished work with a cover sheet.

Rembrandt, whose painting you will study, built his pictures from great masses of shadow and a few areas of warm light. Thinking in masses is the first step toward chiaroscuro.

PICTURE STUDY



The Return of the Prodigal Son, Rembrandt van Rijn, about 1661–1669 · Oil on canvas · Hermitage Museum, Saint Petersburg

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

This is Rembrandt's painting of Jesus's parable of the lost son (Luke 15), made near the end of his life. It is one of the most moving pictures of forgiveness ever painted, and it is built almost entirely from large masses of dark and a few areas of glowing light.

Look closely

- Squint until the details disappear. What are the big shapes of light? Where are the big shapes of dark?
- Where is the brightest light? Whose face and hands does it fall on?
- Find the figures on the right. How much of them can you see clearly?
- Look at the father's two hands on his son's back. Are they the same?

Talk about it

1. Why do you think Rembrandt let most of the painting sink into shadow?
2. How does the light help tell the story of the parable?
3. Look at the elder brother standing on the right. How does Rembrandt use light to show that he is apart from the embrace?

STUDIO PROJECT

A Reductive Charcoal Still Life

You will draw a simple still life by the reductive method: tone the whole paper, lift the lights, then add the darks. Think in big masses, like Rembrandt.

You will need

- Drawing paper or charcoal paper, 11×14 in (smooth copy paper will not work well)
- Vine or willow charcoal
- Compressed charcoal stick or charcoal pencil
- Kneaded eraser and a white vinyl eraser
- Paper towels
- A clean sheet of paper to rest your hand on
- Two or three simple objects (a jug, a bowl, an onion or pear) and a lamp
- Old shirt or apron; damp rag for hands

Steps

1. Set the objects on a table against a plain background and light them from one side with the lamp. Turn off other lights.
2. Cover your whole paper with the side of a vine charcoal stick. Rub it smooth with a folded paper towel to make an even middle gray.
3. With the end of the vine charcoal, lightly sketch the big shapes of the objects and their cast shadows. Keep lines light.
4. Squint. With a kneaded eraser shaped into a flat edge, lift out the large light shapes: the lit sides of the objects and the lit part of the table.
5. With compressed charcoal, mass in the darkest shapes: the core shadows, the cast shadows near the objects, and any dark background.
6. Leave the middle gray of the ground for the halftones and reflected light.
7. Refine edges: soft where forms turn gradually, sharp where they meet dark backgrounds. Use a paper towel or stump to soften.
8. Pinch the kneaded eraser to a point and lift the brightest highlights last.

9. Tap the drawing (not blow!) over a trash can to remove loose dust. Cover it with a clean sheet to store.

Tips

- Use the side of the charcoal for big areas and the tip only for edges and accents.
- Knead the eraser often; a dirty eraser puts charcoal back on.

Check your work

- ☐ My whole paper started as a middle gray.
- ☐ My lights were lifted out with an eraser.
- ☐ I have at least four clear values: highlight, light, middle and dark.
- ☐ The drawing reads as solid objects under one light, even from across the room.

SKETCHBOOK PRACTICE

1. Make five two-minute charcoal sketches of objects using only the side of the stick: no lines.
2. Copy the Prodigal Son in a small charcoal thumbnail with only three values.
3. Tone a sketchbook page with charcoal and lift out the shape of a window with light coming in.

From history. Rembrandt made hundreds of drawings in chalk, ink and wash, often quick studies of people and Bible stories. He taught many students in his Amsterdam workshop to draw by massing light and shadow, a practice that passed to art schools for centuries.

COMMON MISTAKES

- Starting with dark outlines, which are hard to remove and fight the massing method.
- Smudging with fingers, which leaves oily marks. Use paper towels or a stump.
- Blowing dust off the paper. Tap it into a trash can instead.

Make it a game • No Outlines Sprint. Tone a sheet of paper with graphite or charcoal. Set a two-minute timer and draw an object by lifting light shapes with an eraser. No outlines are allowed. Your parent guesses what it is. Then switch roles. Say why massing big shapes first works better than starting with a line.

4.3 CHIAROSCURO AND TENEBRISM

OBJECTIVES

- Explain the difference between chiaroscuro and tenebrism.
- Describe how Caravaggio used dramatic light to tell a story.
- Draw a still life in white and black on dark paper, “drawing the light.”

Warm-up. In a dark room, shine a flashlight on your hand from the side, then from above, then from below. Sketch the shape of the lit part each time in one minute. Which looks most dramatic?

WATCH

Caravaggio's 'Supper at Emmaus': A Baroque masterpiece illuminated | National Gallery

The National Gallery · 9:13

https://www.youtube.com/watch?v=cTDK6k66k_k

WHEN TO WATCH

After your own first look at the picture study. The curator points out details you may have missed.

BACKUP VIDEO

Caravaggio, Supper at Emmaus

Smarthistory · 4:03

<https://www.youtube.com/watch?v=asLQmxK7ExY>

Optional, a short conversation about the same painting.

KEY TERMS

chiaroscuro

Italian for “light-dark”: using strong contrasts of light and shadow to model form and create drama.

tenebrism

An extreme kind of chiaroscuro in which most of the picture is in deep darkness and a few forms are lit as if by a spotlight. From the Italian *tenebroso*, “murky.”

Baroque

The style of European art from about 1600 to 1750, known for drama, movement and strong light.

foreshortening

Drawing a form that points toward or away from the viewer so it looks shortened, creating depth.

CORE IDEAS

Chiaroscuro is any strong use of light and dark to make forms look solid and to give a picture drama. Leonardo used soft chiaroscuro to model faces with gentle shadow. Around 1600, a young painter in Rome named Michelangelo Merisi da Caravaggio pushed it much further. He painted figures as if they stood in a dark cellar lit by one high window. Most of the picture fell into near-black; a few faces, hands and objects blazed out of it. This extreme form is called **tenebrism**.

Tenebrism does three things at once. It makes forms look intensely solid and close, almost within reach. It simplifies the picture, because everything unimportant disappears into dark. And it creates drama: the light becomes like a spotlight on a stage, pointing to the moment that matters. Caravaggio used this to make Bible stories feel as though they were happening right now, to real people.

Painters across Europe copied him. In Spain, Ribera and the young Velázquez; in Holland, the painters of Utrecht and, in his own way, Rembrandt; in France, Georges de La Tour, whose candlelit scenes you will see next lesson. Their work shaped how artists have painted light ever since.

To draw in this spirit, you must think about the light first. Use a single strong light source, close to the subject, in a dark room. Let the background go very dark and keep the shadow areas simple and dark; put your effort into the shapes of light. A good way to practice is to draw on **dark paper** with white chalk or white charcoal, adding only the light, as if you were the lamp.

Light in Christian art is never only light. In the Gospels, Christ is the Light of the world, and painters such as Caravaggio and Rembrandt used real light to point toward that truth.

PICTURE STUDY



Supper at Emmaus, Caravaggio, 1601 · Oil and tempera on canvas · National Gallery, London

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

After the Resurrection, two disciples walked to the village of Emmaus with a stranger, and did not recognize Him until He blessed and broke the bread at supper (Luke 24). Caravaggio paints the instant of recognition, with light striking the scene like a sudden revelation.

Look closely

- Find the direction of the light. Where does it enter, and where is the darkest dark?
- Look at the basket of fruit at the edge of the table. What is its shadow like? Does it look as if it might fall into your lap?
- Look at the disciple on the right with his arms flung wide. Which hand seems to come right out toward you?
- Look behind Christ's head. Whose shadow falls on the wall there, and what does it do to His face?

Talk about it

1. How does the strong light make you feel you are at the table?
2. Why might Caravaggio have shown Christ without a beard, unlike most paintings of Him?

3. Each person reacts differently. Which reaction does the light make you notice first?

STUDIO PROJECT

Drawing the Light on Dark Paper

You will draw a still life on black or dark gray paper, adding only the light with white charcoal or chalk. Like Caravaggio, you will let the darkness stay dark and think only about where the light falls.

You will need

- Black or dark gray paper (construction paper, pastel paper or cardstock), 9×12 in
- White charcoal pencil, white pastel pencil, or white chalk
- A white colored pencil for details (optional)
- Charcoal pencil or black pastel for touches of deepest dark (optional)
- Two or three objects with interesting shapes: a jug, an egg, bread, fruit, a cup on a plate
- A lamp or flashlight; a dark room

Steps

1. Arrange the objects close together on a dark cloth, if you have one. Light them from high to one side with a lamp close by. Darken the room as much as you can.
2. Squint. Notice that only some parts are lit; the rest disappears into darkness.
3. Very lightly, with the white pencil, sketch only the outer shapes of the lit areas, not the outlines of the whole objects.
4. Fill the lit shapes with a light layer of white. Press lightly; you can always add more.
5. Build up the brightest areas (the parts facing the light most directly) with more pressure, and add the sharp highlights last.
6. Let the halftones fade gradually into the dark paper as the forms turn away.
7. Add a little reflected light only where you clearly see it, very faint.
8. Leave the shadows and background as the dark paper. Resist the urge to outline anything in shadow.

9. Spray nothing; store the drawing under a clean cover sheet.

Tips

- It feels backward at first: you are drawing light instead of dark. Keep asking, “Where is the light?”
- If the drawing seems to need an edge, try a soft fade instead of a line.

Check your work

- ☐ Only the lit areas are drawn; the shadows are the dark paper.
- ☐ The brightest whites are on the surfaces facing the light.
- ☐ The halftones fade smoothly into the dark.
- ☐ The objects look solid and dramatic, like a tenebrist painting.

SKETCHBOOK PRACTICE

1. Copy one head or hand from the Supper at Emmaus in charcoal, showing only light and shadow masses.
2. Draw a family member’s face lit by a lamp from one side in a dark room, using only two values: light and shadow.
3. Look through a book of paintings and find one tenebrist painting and one with soft chiaroscuro. Make a thumbnail of each.

From history. Caravaggio was a brilliant but troubled man who had many quarrels. Yet his religious paintings changed European art. He painted ordinary people, with dirty feet and worn clothes, as the saints and disciples, which shocked some viewers and moved many others.

COMMON MISTAKES

- Outlining every object in white, which flattens the picture.
- Lighting the room too, so the shadows fill with light and the drama disappears.
- Making the whole object equally white. Only the planes facing the light should be brightest.

Make it a game • Spotlight Statues. In a dim room, pose a stuffed animal or your parent under a single lamp. Adjust the lamp to make a gentle contrast, then dramatic darkness. Your parent calls which is chiaroscuro and which is tenebrism. Tell how Caravaggio used strong light to tell a story. Score a point for each right call.

Scripture. “And their eyes were opened, and they knew him; and he vanished out of their sight.” (Luke 24:31, KJV)

Caravaggio paints the moment just before this verse ends: eyes opened, recognition flooding in, shown by a flood of light.

4.4 DRAWING BY CANDLELIGHT-LIKE LIGHT

OBJECTIVES

- Observe how a small, close light source changes shadows and edges.
- Show a visible light source in a drawing and the glow it casts.
- Draw a hand and object lit from close by in strong chiaroscuro.

Warm-up. In a dim room, hold a flashlight or battery candle close to an egg, then far away. Sketch both. How do the shadows change? (Close light makes shadows spread and soften; far light makes them crisper.)

WATCH

How to Shade an Egg. | Drawing Tutorial | Depicting Form with Light & Shadow

SchaeferArt · 13:19

<https://www.youtube.com/watch?v=wyCJ4E8wCTA>

WHEN TO WATCH

Before the studio project. Notice how he finds the core shadow, reflected light and cast shadow on an egg in one strong light.

KEY TERMS

light source

Where the light comes from: the sun, a window, a lamp or a flame.

falloff

The way light gets dimmer the farther it travels from a small source.

translucency

The quality of letting some light pass through, as light glows red through thin fingers or ears.

lost edge

An edge that melts into the background because the form and the background are nearly the same value.

CORE IDEAS

Sunlight comes from so far away that all its rays are nearly parallel, and its brightness is even across a scene. A candle or small lamp is different. It is **close and small**, so its rays spread out from one point. Objects near the flame are brightly lit; objects a little farther away are much dimmer. This rapid dimming is called

falloff, and it is what gives candlelit pictures their glowing pool of light surrounded by darkness.

Because the light spreads from a point, **shadows** fan outward and grow larger the farther they fall. A cup near a candle can cast a huge shadow on the wall. When the light is low, below eye level, shadows climb upward on walls and faces, which looks unusual and dramatic. When the light is hidden behind a hand or object, the edges of that hand glow.

Light passing through thin parts of the body (fingertips, the edges of the ears) glows warm red and orange. This is **translucency**. Georges de La Tour painted it beautifully in *Joseph the Carpenter*, where the light shines through the boy Jesus's fingers as he shields the candle. Drawing this glow requires leaving those areas lighter than you expect.

In a candle-lit drawing, plan your values around the flame. The flame itself is the lightest light. The surfaces closest to it and facing it are next. Everything else steps down quickly into darkness. Many edges far from the light become **lost edges**, melting into the background. Let them; you do not need to draw what the light does not show.

Safety: use a battery candle or a small flashlight for this lesson. If you use a real candle, an adult must be present, the candle must be in a sturdy holder away from paper, and hair and sleeves must be kept back.

PICTURE STUDY



Joseph the Carpenter, Georges de La Tour, about 1642 · Oil on canvas · Louvre, Paris

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

Georges de La Tour was a French painter who loved to paint scenes lit by a single candle. Here the boy Jesus holds a candle for Joseph in his carpenter's workshop. The light falls on both faces, and the darkness all around makes the scene feel quiet and holy.

Look closely

- Find the flame. What is the brightest part of the whole painting?
- Look at the boy's hand in front of the flame. What color is the light that shines through his fingers?
- Compare the boy's face with Joseph's. Which is closer to the light? How can you tell?
- Look at Joseph's tool and the wooden beam. Where does the light reach them, and where does it fade?

Talk about it

1. Why is the boy's face so smooth and glowing while Joseph's is wrinkled and partly shadowed?
2. Joseph is drilling a hole in a beam of wood. What might that beam remind a Christian viewer of?

3. How does the darkness around the edges make you feel?

STUDIO PROJECT

A Hand Holding the Light

You will draw your own hand (or a family member's) holding or shielding a small light, along with one or two nearby objects, in a darkened room. Your drawing will show the pool of light, its quick falloff into darkness, and the glow through the fingers.

You will need

- Gray-toned paper or white drawing paper, 11×14 in
- Charcoal (vine and compressed) or graphite (HB–6B)
- White charcoal pencil or white chalk (if using toned paper)
- Kneaded eraser
- A battery candle or small flashlight
- One or two objects (a cup, an apple, a small book)
- A darkened room and a helper (optional)

Steps

1. Darken the room. Set the battery candle or flashlight on the table. Place one object near it and one a little farther away.
2. Cup or hold your non-drawing hand near the light so the light shines on and through the fingers. If holding the pose is hard, have a helper hold the light and pose for you, or take a reference photo and work from both.
3. Sketch the composition lightly: the light, the hand and the objects. Place the light source a little off center.
4. If on white paper, cover everything except the area around the light with a middle tone. If on gray paper, the paper is already your middle tone.
5. Draw the light source as the lightest value: leave it as white paper, or add white chalk.
6. Add the lit surfaces near the light, getting darker quickly as they move away from it.
7. Draw the glow between and through the fingers as a warm light value (or a light gray with white highlights).

8. Darken the background and far edges, letting some edges disappear into darkness.
9. Draw the shadows of the objects fanning outward from the light. Make them darkest and sharpest close to each object.

Tips

- Squint often. Only three things matter: the light, what it touches, and the darkness.
- Do not draw edges that the light does not show.

Check your work

- ☐ The light source is the lightest part of my drawing.
- ☐ Objects get darker quickly as they move away from the light.
- ☐ Shadows fan outward from the light.
- ☐ The edges of the fingers glow, and some far edges are lost in the dark.

SKETCHBOOK PRACTICE

1. Draw a family member's face lit only by a flashlight held below the chin, then held above the head. Which is friendlier?
2. Copy the boy's hand and face from *Joseph the Carpenter* in charcoal.
3. Draw a lamp in a dark room, showing the pool of light it makes on a table.

From history. Georges de La Tour was almost forgotten for nearly 300 years. In the early 1900s scholars rediscovered his paintings, many of which had been credited to other artists, and he is now admired as one of the great painters of light.

COMMON MISTAKES

- Lighting the far side of the room as brightly as the near side. Light falls off quickly.
- Making all shadows parallel. With a close light, shadows spread outward.
- Outlining things that sink into darkness. Let them disappear.

Make it a game • Falloff Walk. Put a small flashlight on a table and place three identical cups at one, two and three feet away. Predict which will be brightest and which shadow is softest, then test. Say how a small close light changes edges. Score a point for every right prediction. Never use a real flame.

Scripture. “And the light shineth in darkness; and the darkness comprehended it not.” (John 1:5, KJV)

La Tour paints a small light held by the young Christ, shining in a dark room. The painting is a quiet picture of this verse.

UNIT 4

LIGHT: CHIAROSCURO

Chiaroscuro (kee-AR-oh-SKOOR-oh) is Italian for “light-dark.” It names the art of using light and shadow to make flat paper look solid and to give a picture drama and focus. In this unit you will learn the parts of light on a form (highlight, halftone, core shadow, reflected light, cast shadow), render them in graphite and in charcoal, and study the masters who pushed light and dark to its limits: Caravaggio, Rembrandt and Georges de La Tour.

Your most important tool this unit is not a pencil but a lamp. A single strong light in a dim room makes the shapes of light and shadow clear and simple. Once you can see them, you can draw anything that light falls on.

PREREQUISITES

- Can make a smooth value scale from white to black (Units 1 and 3)
- Can sight-measure proportions (Unit 2)
- Has HB–6B pencils, vine and compressed charcoal, and a kneaded eraser

MASTERY CHECKLIST

- ☐ I can name and find the highlight, halftone, core shadow, reflected light and cast shadow on a form.
- ☐ I can render a sphere, cube and cylinder in graphite with a consistent light source.
- ☐ I can tone paper with charcoal and lift out lights with an eraser.
- ☐ I can explain the difference between chiaroscuro and tenebrism.
- ☐ I can draw a still life lit by one strong light, with dramatic contrast.

LESSONS IN THIS UNIT

4.1 Rendering Form in Graphite

2 sessions of 50 minutes

4.2 Drawing in Charcoal: Massing Light and Dark

2 sessions of 50 minutes

4.3 Chiaroscuro and Tenebrism

2 sessions of 50 minutes

4.4 Drawing by Candlelight-Like Light

2 sessions of 50 minutes

UNIT 4 REVIEW

Answer each question. Questions 11 and 12 should be written in complete sentences. You may make a sketch to help answer any question. 100 points total.

1. (7 pts)

Name the five parts of light and shadow on a sphere, from lightest to the cast shadow.

2. (7 pts)

Where is the core shadow, and why is it the darkest part on the form?

3. (7 pts)

Why should reflected light never be as bright as the lit side?

4. (7 pts)

How is the light on a cube different from the light on a sphere?

5. (7 pts)

Why should you build dark graphite tones with soft pencils instead of pressing hard with a hard pencil?

6. (7 pts)

What is the reductive method in charcoal?

7. (7 pts)

What does massing mean?

8. (7 pts)

What is the difference between chiaroscuro and tenebrism?

9. (7 pts)

Name the Italian painter most associated with tenebrism and one painter he influenced.

10. (7 pts)

How do shadows from a candle differ from shadows in sunlight?

11. 15 pts

Written answer: Describe how Caravaggio uses light in *Supper at Emmaus* to tell the story of the disciples' recognition.

12. 15 pts

Written answer: Explain how Georges de La Tour shows a small, close light in *Joseph the Carpenter*. Mention falloff and translucency.

ANSWER KEY

1. Highlight, halftone, core shadow, reflected light, cast shadow.
2. Where the form turns away from the light; it gets no direct light and little reflected light.
3. It is weak bounced light inside the shadow family; making it too bright makes the form look hollow or glassy.
4. A cube has flat planes, each a fairly even value with crisp edges; a sphere changes gradually in all directions.
5. Pressing hard polishes the paper and makes a shiny tone that will not darken; soft pencils give darker tone without damage.
6. Tone the paper with charcoal first, then lift out the lights with an eraser and add the darks.
7. Drawing the large shapes of light and shadow first instead of starting with outlines and details.
8. Chiaroscuro is strong use of light and dark to model form; tenebrism is an extreme kind, with most of the picture in deep darkness and a few areas spotlit.
9. Caravaggio; influenced Georges de La Tour, Ribera, Velázquez, Rembrandt and others.
10. Candle shadows spread outward and grow larger with distance and the light falls off quickly; sunlight shadows are nearly parallel and the light is even.
11. Model: A strong light from the upper left strikes Christ's face and blessing hand and the startled disciples against a dark background, like a sudden revelation. The darkness removes distractions, and the bright light on the outstretched hands and the basket teetering at the table's edge pushes the scene out toward us. The innkeeper's shadow falls on the wall behind Christ, making His lit face stand out. The light shows the moment the disciples' eyes are opened.
12. Model: The candle held by the boy Jesus is the brightest point. The faces and hands nearest it are brightly lit, while the light falls off quickly so Joseph's back and the workshop sink into darkness. The light glows red-orange through the boy's fingers, showing translucency. Edges far from the flame are lost in shadow, giving a quiet, reverent mood.

PORTFOLIO PIECE: A CHIAROSCURO STILL LIFE

Arrange a still life of three to five objects with different forms and surfaces (something round, something boxy, something shiny, something cloth). Light it with one strong lamp in a dark room. Make a finished drawing in charcoal or graphite, 11×14 in or larger, with dramatic chiaroscuro: deep darks, a clear focal point lit most brightly, and all five parts of light shown on at least one object.

LOOK FOR	WHAT IT MEANS
Single light source	All highlights and shadows agree on one light direction.
Parts of light	Highlight, halftone, core shadow, reflected light and cast shadow are clearly shown.
Value range and drama	A full range from white to deep black, with strong contrast at the focal point.
Edges	Sharp and soft edges are used on purpose; some edges are lost in shadow.
Craftsmanship	Tone is built evenly, the paper is clean outside the drawing, and the work is signed and dated.

UNIT 5

MATERIAL SCIENCE: DRAWING MEDIA

Every mark you make is a small piece of chemistry and physics. A pencil line is millions of flakes of carbon sheared off a crystal and caught in the fibers of paper. A charcoal smudge is what is left of a burned twig. An eraser works by being stickier than paper. In this unit you will learn what your drawing materials are made of, how they are made, and why they behave the way they do.

Knowing your materials is part of craftsmanship. It tells you which pencil to reach for, which paper will take a wash, why a drawing smudges, and how to keep your work safe for years. You will test each material with your own hands and record the results like a scientist, and you will meet the masters who used these same materials: Dürer's silverpoint and charcoal, Hokusai's paper, and Liotard's pastels.

PREREQUISITES

- Has used graphite pencils of several grades and charcoal (Unit 4)
- Can make a value scale
- Keeps a sketchbook for notes

MASTERY CHECKLIST

- ☐ I can explain what pencil "lead" is made of and what H and B mean.
- ☐ I can explain how charcoal is made and the difference between vine and compressed charcoal.
- ☐ I can describe how paper is made and what fiber, sizing, tooth and weight mean.
- ☐ I can choose the right eraser for a job and explain how erasers work.
- ☐ I know how fixative works and the safety rules for using it.

LESSONS IN THIS UNIT

5.1 Graphite: How Pencils Are Made

2 sessions of 50 minutes

5.2 Charcoal: Vine and Compressed

2 sessions of 50 minutes

5.3 Paper: Fiber, Sizing and Tooth

2 sessions of 50 minutes

5.4 Erasers, Blending Tools and Fixative

2 sessions of 50 minutes

UNIT 5 REVIEW

Answer each question. Questions 11 and 12 should be written in complete sentences. Your test charts from this unit may be used for reference. 100 points total.

1. (7 pts)

What is pencil “lead” really made of?

2. (7 pts)

Why does graphite leave a mark on paper?

3. (7 pts)

What do H and B mean, and what makes a pencil harder or softer?

4. (7 pts)

What is silverpoint, and why could Dürer not erase his self-portrait?

5. (7 pts)

How is charcoal made, and why does it not turn to ash?

6. (7 pts)

Compare vine charcoal and compressed charcoal. When would you use each?

7. (7 pts)

How is paper made? Name the main steps.

8. (7 pts)

What is sizing, and what would happen to ink on paper without it?

9. (7 pts)

What is the difference between hot press and cold press paper?

10. (7 pts)

How does an eraser work, and why does a kneaded eraser leave no crumbs?

11. (15 pts)

Written answer: Explain what fixative is, how it works, and list at least four safety rules for using it.

12. **15 pts**

Written answer: You want to make a large charcoal drawing that will last many years. Describe which charcoal, paper and eraser you would choose and why, using what you learned about each material.

ANSWER KEY

1. Graphite (a form of carbon) mixed with clay, fired, and soaked in wax; there is no lead.
2. Its carbon atoms form flat sheets that slide apart easily, so the paper's tooth scrapes off flakes that lodge in the fibers.
3. H is hard, B is black/soft. More clay makes it harder and lighter; more graphite makes it softer and darker.
4. Drawing with a silver stylus on paper coated with a gritty ground; the silver lines are bonded to the ground and cannot be erased.
5. Wood is heated in a sealed container with little air; water and gases leave but there is not enough oxygen to burn, so carbon remains.
6. Vine is soft, gray, has no binder and erases easily, good for the first lay-in. Compressed is powder plus binder, darker and harder to erase, good for final darks.
7. Plant fibers are beaten in water into pulp; a screen (mould) lifts out a thin layer; water drains and fibers interlock; the sheet is pressed and dried.
8. A substance like gelatin or starch that slows absorbency; without it ink would bleed and feather into blots.
9. Hot press is pressed with hot rollers and smooth; cold press keeps a light texture (more tooth).
10. It is stickier to graphite or charcoal particles than the paper is, gripping them and carrying them off in crumbs. A kneaded eraser stays soft and sticky and holds the particles inside as you knead it.
11. Model: Fixative is a thin resin dissolved in a fast-evaporating solvent, sprayed as a mist; when the solvent evaporates, the resin film glues loose charcoal, graphite or pastel particles to the paper. Safety: only an adult sprays it; outdoors in still air; away from any flame; hold the can about a foot away and spray light coats; students stand back and do not breathe the mist.
12. Model: I would choose heavy, acid-free drawing or charcoal paper with good tooth, because tooth holds charcoal particles and acid-free paper will not yellow or crumble. I would lay in with vine charcoal, which erases easily, and finish darks with compressed charcoal, which has a binder and makes deep blacks. I would use a kneaded eraser to lift lights without damaging the paper. When

finished, I would protect it with a cover sheet or have an adult spray fixative outdoors, and store it flat.

PORTFOLIO PIECE: A MIXED DRAWING MEDIA STUDY

Make one finished drawing (11×14 in or larger) of a natural or household subject that uses at least three drawing media from this unit on purpose: for example, hard graphite for the delicate parts, charcoal for deep darks, and a kneaded eraser to lift lights, on a paper you chose for its tooth. Attach a short materials label on the back, like a museum label, listing each material and why you chose it.

LOOK FOR	WHAT IT MEANS
Choice of materials	At least three media are used, each for a job it does well.
Paper choice	The paper suits the media (tooth, weight), and the choice is explained.
Value and form	A full value range with convincing form and a single light source.
Craftsmanship and care	No accidental smudges; the drawing is protected with a cover sheet; signed and dated.
Materials label	The label accurately names each material and gives a correct reason for each choice.

5.1 GRAPHITE: HOW PENCILS ARE MADE

OBJECTIVES

- Explain what graphite is and why it leaves a mark.
- Describe how pencil leads are made from graphite and clay and what the grades H and B mean.
- Test a range of pencil grades and record their results.

Warm-up. Rub a soft pencil (4B or 6B) hard on a scrap of paper to make a dark patch. Rub your finger across it. Tilt the paper toward a window. What do you notice about the feel and the shine?

WATCH

How Are Pencils Made?

History of Simple Things • 8:13

<https://www.youtube.com/watch?v=VmMsNn7FkVs>

WHEN TO WATCH

After the first two core ideas. Watch for the step where graphite and clay are mixed and the leads are fired in a kiln.

BACKUP VIDEO

Drawing Basics: Understanding Pencil Grades

Leanne Bishop • 4:34

<https://www.youtube.com/watch?v=8IM05ZpBueo>

Before the studio project, for a clear explanation of the H to B scale.

KEY TERMS

graphite

A soft, gray-black form of pure carbon whose atoms are arranged in flat, stacked sheets that slide apart easily.

binder (in a pencil)

Fine clay mixed with graphite to hold it together and control its hardness.

H and B

Pencil grades: H means hard (more clay, lighter lines); B means black or soft (more graphite, darker lines). HB is in the middle.

silverpoint

An older drawing method using a silver stylus on specially coated paper, which leaves fine gray lines that cannot be erased.

CORE IDEAS

There is no lead in a “lead” pencil and never has been. The core is **graphite**, a form of pure carbon (the same element as diamond and charcoal). In graphite, the carbon atoms are joined in flat sheets, like layers of chicken wire, stacked on top of each other. The sheets hold together only weakly, so they slide apart. When you drag a pencil across paper, the tooth of the paper scrapes off tiny flakes of these sheets, and the flakes lodge among the fibers. That is your line. Because the flakes are flat and smooth, dark graphite has a metallic sheen.

In the 1500s, shepherds in Borrowdale, in northern England, found a deposit of unusually pure graphite. People thought it was a kind of lead and called it “black lead,” and the name stuck. Pure graphite sticks were wrapped in string or wood and used for writing and drawing. In 1795, when France could not get English graphite, the inventor Nicolas-Jacques Conté found a new method: grind graphite into a powder, mix it with clay and water, shape it into rods, and fire it in a kiln. This made pencils possible from lower-quality graphite, and it allowed something new: **grades**.

The recipe is still the same. More **clay** makes a harder lead that leaves less graphite, so lines are lighter and finer: the **H** pencils (2H, 4H and so on, harder as the number rises). More **graphite** makes a softer, darker lead that wears down fast and smudges easily: the **B** pencils (2B to 8B or more, softer as the number rises). HB and F are in the middle. After firing, the leads are soaked in hot wax or oil to make them glide, then glued between two grooved slats of cedar wood, which is soft enough to sharpen cleanly.

This explains why you use different pencils for different jobs. Hard pencils make light guidelines that are easy to erase and do not smudge. Soft pencils make rich darks. But even the softest graphite turns shiny when it is very dark, which is why artists switch to charcoal for deep blacks.

Before pencils, artists drew with **silverpoint**: a stylus of silver drawn over paper coated with a slightly gritty ground made from bone ash or chalk and glue. It leaves

very fine gray lines that slowly tarnish to a warm brown. It cannot be erased, so every line must be placed with care. Dürer drew his self-portrait at thirteen this way.

PICTURE STUDY



Self-Portrait at the Age of 13, Albrecht Dürer, 1484 · Silverpoint on prepared paper · Albertina, Vienna

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

Albrecht Dürer drew this when he was only twelve or thirteen, looking in a mirror. It is his oldest surviving drawing and one of the earliest self-portraits by any European artist. Years later he wrote in the corner that he had drawn it from a mirror “when I was still a child.”

Look closely

- Look at the lines. Are they bold and thick or fine and delicate? Why might that be, given the material?
- Look for places where Dürer changed his mind. Could he erase?
- How does he show the roundness of the cheek and the folds of the sleeve with only lines?
- Find the pointing hand. Why might it look a little awkward?

Talk about it

1. What does this drawing tell you about Dürer as a boy?
2. How would drawing without any eraser change the way you work?
3. Compare this drawing with your own self-portrait from Unit 2. What did you each find hard?

STUDIO PROJECT

A Pencil Laboratory

You will test six or more pencil grades the way a scientist tests materials, and record the results on a reference chart you can keep in your sketchbook. Then you will make a small drawing that uses the right grade for each job.

You will need

- Drawing paper, 11×14 in
- Graphite pencils, as many grades as you have (for example 2H, HB, 2B, 4B, 6B)
- Ruler
- Kneaded eraser and vinyl eraser
- A magnifying glass (optional)
- A small object to draw: a pinecone, shell or key

Steps

1. Rule a chart with one row for each pencil and five columns: Darkest Value, Gradation, Erasing, Smudging, Shine.
2. **Darkest Value:** with each pencil, fill a small square as dark as you can without tearing the paper.
3. **Gradation:** with each pencil, shade a 2-inch strip from as light to as dark as it will go.
4. **Erasing:** draw a short dark line with each pencil and erase it with the vinyl eraser. Rate how cleanly it erased (1 to 5).
5. **Smudging:** draw a patch with each pencil and rub it once with your fingertip covered by a tissue. Rate how much it smudged.
6. **Shine:** tilt the paper toward the light and rate how shiny each dark square is.
7. Look at the soft and hard squares through a magnifying glass. Write what you see.
8. Below the chart, draw your small object: guidelines in 2H or HB, middle tones in 2B, darkest accents in 4B or 6B.

9. Write three conclusions: “Use hard pencils for...”, “Use soft pencils for...”, “The shine happens because...”

Tips

- Sharpen all pencils before you start so the tests are fair.
- Older students may sharpen with a craft knife and sandpaper block, only with an adult present, cutting away from the body.

Check your work

- ☐ My chart tests at least four grades in all five columns.
- ☐ My conclusions match what I observed.
- ☐ My object drawing uses different grades for guidelines, middle tones and darks.
- ☐ I can explain what H and B mean and why.

SKETCHBOOK PRACTICE

1. Draw a cedar pencil cut lengthwise (from the video or your imagination) and label the lead, the wood slats and the glue line.
2. Try drawing a small object using only a 2H pencil, then only a 6B. Write which was harder and why.
3. Draw for ten minutes without erasing anything, like silverpoint. Make every line count.

From history. Graphite from Borrowdale was so valuable that the mine was guarded, and stealing from it was made a serious crime. Conté’s method of mixing graphite with clay, invented during a time of war and shortage, is still how pencils are made today.

COMMON MISTAKES

- Using one pencil for everything. Match the grade to the job.
- Pressing hard with an H pencil to get a dark, which dents the paper and leaves grooves that show later.
- Believing pencils contain lead. They contain graphite and clay.

Make it a game • H or B Lightning Round. Your parent calls a drawing job: a crisp pale line, a rich dark shadow, a sketchy guide. You answer H or B in five seconds. Ten rounds. Then both of you say what pencil lead is made of, why it leaves a mark, and what silverpoint is. Ten correct answers earns bragging rights.

Scripture. “And I have filled him with the spirit of God, in wisdom, and in understanding, and in knowledge, and in all manner of workmanship, To devise cunning works, to work in gold, and in silver, and in brass,” (Exodus 31:3-4, KJV)

God gave Bezalel, the craftsman of the tabernacle, knowledge of his materials as well as skill. Understanding what we work with is part of good workmanship.

5.2 CHARCOAL: VINE AND COMPRESSED

OBJECTIVES

- Explain how charcoal is made and why it is black.
- Compare vine, compressed and pencil charcoal by testing them.
- Draw a portrait study in charcoal using each type for its best purpose.

Warm-up. Make three marks side by side: one with vine charcoal, one with compressed charcoal, one with a 6B pencil. Rub each with a tissue and try to erase half of each. Which was darkest? Which erased most easily? Which shines?

WATCH

Charcoal 101, all about charcoal drawing.

Jordan Swain Visual Art • 6:21

<https://www.youtube.com/watch?v=APYVWYHS654>

WHEN TO WATCH

After the core ideas, before the testing in the project.

Note: The description has links to her paid lesson and to shops; the video itself is a clear overview.

BACKUP VIDEO

Compressed vs. Vine Charcoal

Trenton Reynolds • 7:03

<https://www.youtube.com/watch?v=T5Lv-JJ4HXA>

Optional, a side-by-side comparison of the two kinds.

KEY TERMS

charcoal

The black, mostly carbon material left when wood is heated with very little air, so it chars instead of burning to ash.

vine (or willow) charcoal

Thin sticks of charred grapevine or willow twigs; soft, gray-black, and easy to erase.

compressed charcoal

Charcoal powder mixed with a binder (such as gum or clay) and pressed into dense sticks; darker, harder to erase.

matte

Without shine. Charcoal is matte; graphite is shiny.

CORE IDEAS

Charcoal is wood that has been cooked without enough air to burn. When twigs are heated to a high temperature in a sealed tin or kiln, the water and the oily, smoky parts of the wood are driven off as gas, but because there is little oxygen, the wood cannot burst into flame and turn to ash. What remains is a light, brittle stick of nearly pure **carbon** that still has the shape of the twig. Carbon in this rough, broken form absorbs almost all light, which is why charcoal is so black and so **matte**.

Charcoal is probably the oldest drawing material in the world. Prehistoric painters drew animals on cave walls with burnt sticks from their fires. Renaissance artists drew their large plans for frescoes in charcoal, and painters still use it to sketch on canvas, because it brushes off easily.

Vine or willow charcoal is the twig itself, charred. It has no binder; its particles rest loosely on the paper's tooth. That makes it soft, gray-black, quick to cover large areas, and very easy to wipe off or erase, which is perfect for the first, searching stages of a drawing. Thin sticks are "soft," thicker ones a little harder. **Compressed charcoal** is made by grinding charcoal to powder, mixing it with a binder such as gum or clay, and pressing it into square or round sticks. The binder holds more carbon in each mark, so it makes deep, velvety blacks, but it is harder to erase. **Charcoal pencils** are compressed charcoal in a wooden case, good for details.

So a charcoal drawing usually moves from vine to compressed: vine for the light, changeable lay-in, compressed for the final darks. If you put compressed charcoal down first, it is very hard to move. (White charcoal pencils are not really charcoal; they are white pigment, usually chalk or titanium white, with a binder.)

Because charcoal particles are held so loosely, charcoal drawings smudge at the lightest touch. Rest your hand on a clean sheet, tap dust into the trash instead of blowing it, and protect finished drawings with a cover sheet or fixative (Lesson 5.4).

PICTURE STUDY



Portrait of the Artist's Mother at the Age of 63, Albrecht Dürer, 1514 · Charcoal on paper ·
Kupferstichkabinett, Berlin

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

Thirty years after his silverpoint self-portrait, Dürer drew his mother, Barbara, in charcoal, two months before she died. He did not flatter her. With honest, tender attention he recorded her age and illness. Charcoal let him work boldly and fast.

Look closely

- Compare these lines with the lines of Dürer's silverpoint self-portrait. How are they different?
- Find the darkest blacks. Where did Dürer press hardest?
- Look at how he drew the folds of the head cloth: with lines, or with tone?
- Look at her eyes and the hollows of her cheeks. How did he show the shapes of the face?

Talk about it

1. Why do you think Dürer chose charcoal, rather than silverpoint or paint, for this drawing?
2. What do you think he felt about his mother? What in the drawing makes you think so?

3. Is this drawing beautiful? Explain your answer using the idea of truth.

STUDIO PROJECT

Charcoal Tests and a Portrait Study

First you will test the three kinds of charcoal side by side and record the results. Then you will make a charcoal head study of a family member, using each kind for the job it does best.

You will need

- Drawing paper or charcoal paper, 11×14 in (two sheets)
- Vine or willow charcoal
- Compressed charcoal stick
- Charcoal pencil
- Kneaded eraser, paper towels, blending stump
- Clean sheet for resting your hand
- A family member to sit for 20 minutes, lit from one side

Steps

1. On the first sheet, make a three-column chart: Vine, Compressed, Pencil. In each column, test: darkest mark, a smooth gradation, a smudge, an erase, and a fine line.
2. Write one sentence under each column: what is this type best for?
3. On the second sheet, have your sitter sit still with a lamp lighting one side of the face.
4. With vine charcoal, lightly lay in the big shape of the head, the eye line, and the shadow side of the face as one soft mass. Correct freely; wipe away mistakes with a paper towel.
5. When the proportions are right, refine the shadow shapes (eye sockets, under the nose, under the lip and chin) still in vine.
6. Add the darkest darks (pupils, nostrils, the line between the lips, the deepest hair shadows) with compressed charcoal.
7. Use the charcoal pencil for a few crisp details: eyelid edges, a few hairs.
8. Lift highlights with the kneaded eraser.

9. Tap off dust and cover the drawing with a clean sheet.

Tips

- Optional, with an adult outdoors: make your own charcoal by packing thin willow or grapevine twigs in a small metal tin with a pinhole in the lid and setting it in a campfire or grill for about an hour, until smoke stops coming from the hole. Let it cool completely before opening.
- Hold vine charcoal lightly; it breaks easily. Broken pieces are still useful.

Check your work

- ☐ My test chart compares all three kinds of charcoal.
- ☐ My portrait was laid in with vine charcoal and finished with compressed darks.
- ☐ The head has a clear light side and shadow side.
- ☐ My paper is clean outside the drawing.

SKETCHBOOK PRACTICE

1. Draw your own hand in charcoal using only vine charcoal and a kneaded eraser.
2. Copy Dürer's mother in charcoal, at least 6 inches tall.
3. Make ten one-minute gesture sketches of family members in vine charcoal.

From history. Dürer wrote in his family notes that his mother had eighteen children and often lived in poverty and sickness, but was devout and patient. He recorded her death in his notebook with a short prayer for her. This drawing is one of the most personal works he ever made.

COMMON MISTAKES

- Starting with compressed charcoal, which is hard to erase.
- Rubbing charcoal into the paper with fingers, which leaves oil and dull smears.
- Blowing charcoal dust, which spreads it everywhere and puts it in the air you breathe.

Make it a game • Three-Charcoal Chart. Draw a three-column chart headed vine, compressed and pencil charcoal. Set a ninety-second timer and write one true fact in each column, such as how dark, how it smudges, or how it is made. Your parent checks. Try a second chart to beat your fact count.

5.3 PAPER: FIBER, SIZING AND TOOTH

OBJECTIVES

- Explain how paper is made from plant fibers.
- Define sizing, tooth, weight and acid-free and test their effects.
- Make a small sheet of recycled paper and compare it with art papers.

Warm-up. Tear a piece of copy paper and a paper towel. Hold the torn edges up to the light or under a magnifying glass. Sketch what you see along the edge. What are the tiny threads?

WATCH

How Two Rivers Paper Mill make Handmade Rag Paper (On Location)

Jackson's Art · 3:13

<https://www.youtube.com/watch?v=2b-DMktyZpY>

WHEN TO WATCH

After the first core idea, before the project. Watch how the papermaker dips the mould into the vat of cotton pulp and couches each sheet onto felt.

BACKUP VIDEO

Differences between cold press and hot press watercolor paper...

Jenna Rainey · 9:11

<https://www.youtube.com/watch?v=95iUZ7cSwXM>

Optional, before the paper tests, to see how surface texture changes a painting.

KEY TERMS

cellulose fiber

The tiny, tough threads that make up plant cell walls; paper is a mat of these fibers.

sizing

A substance (such as gelatin or starch) added to paper so that it absorbs liquid slowly and ink or paint does not spread.

tooth

The surface texture of paper, the tiny hills and valleys that grip pencil, charcoal or pastel.

paper weight

How heavy and thick paper is, given in grams per square meter (gsm) or in pounds per ream.

acid-free

Paper made without the acids that cause cheap paper to yellow and crumble over time.

CORE IDEAS

Paper is a felt of plant fibers. Every plant is built from microscopic threads of **cellulose**. To make paper, fibers (from wood, cotton rags, linen or the inner bark of plants such as mulberry) are beaten in water until they separate into a soupy pulp. A papermaker dips a fine screen in a frame, called a *mould*, into the pulp and lifts it out level. The water drains through, the fibers settle in a thin, tangled layer and lock together, and the sheet is pressed and dried. Paper was invented in China, traditionally credited to an official named Cai Lun around AD 105, and the craft slowly spread west to Europe over a thousand years.

Plain fibers soak up water like a paper towel; ink would bleed into fuzzy blots. So most papers are treated with **sizing**. Traditional European papers were dipped in warm gelatin made from animal hides; modern papers use starch or synthetic sizes, either mixed into the pulp or brushed on the surface. Japanese woodblock printers brushed their paper with a gelatin-and-alum size called *dōsa*. Good sizing lets watercolor sit on the surface and spread just enough, and keeps ink lines crisp.

Tooth is the surface texture. When paper is pressed between hot, polished metal rollers, it becomes smooth: *hot press*, good for fine pencil and ink. Pressed cold, it keeps a light texture: *cold press*, the most common watercolor and drawing surface. Left unpressed, it is *rough*. Charcoal and pastel need tooth to grip their loose particles; smooth paper lets them slide off. Graphite works on most surfaces but shows the grain of rough paper.

Weight tells thickness. Copy paper is about 75–90 gsm; good drawing paper about 120–200 gsm; watercolor paper often 300 gsm (labeled 140 lb in America) or more, heavy enough not to buckle much when wet. Finally, **acid**. Paper made from

ordinary wood pulp contains lignin and acids that slowly turn it yellow and brittle, like an old newspaper. Paper made from cotton rag or purified, buffered pulp is labeled *acid-free* or *archival* and can last for centuries.

Paper also has a front and back, and often a grain direction (it tears straighter one way). Artists choose paper as carefully as pencils: the right paper makes good work easier, and the wrong paper can make it impossible.

PICTURE STUDY



The Great Wave off Kanagawa, Katsushika Hokusai, about 1831 · Woodblock print; ink and color on paper · Impressions in many museums, including the Metropolitan Museum of Art, New York

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

Hokusai's *Great Wave* is a woodblock print, made by carving wooden blocks, inking them, and pressing them onto strong Japanese paper, one block for each color. Thousands of copies were printed. Its beauty depends on its paper as much as on its design.

Look closely

- Find the deep blue. It was a new imported pigment called Prussian blue. Where is it strongest?
- Look at the edges of the colors. Are they crisp or blurry? What does that tell you about how the paper was sized?
- Find Mount Fuji. How big is it compared with the wave?
- Look at the sky and the light parts of the wave. How much of the picture is simply the color of the paper?

Talk about it

1. Why would a printmaker need paper that is strong, smooth and well sized?
2. How do you think the paper changed after almost two hundred years? (Look at the color of the sky.)

3. Which element of art do you think matters most in this print: line, shape, color or space?

STUDIO PROJECT

Making Paper and Testing Papers

You will make a few small sheets of paper from recycled scraps to feel how fibers mat together, and then test four kinds of paper with pencil, charcoal, marker and watercolor to see how fiber, sizing, tooth and weight change your work.

You will need

- Scrap paper (copy paper, construction paper, egg cartons; no glossy magazines)
- A blender (with an adult) or a bowl and a potato masher
- A small window screen or a frame with screening, and a basin larger than it
- Old towels, a sponge, felt or dish cloths
- Four test papers: copy paper, a paper towel, drawing paper and watercolor paper
- Pencil, vine charcoal, a marker, watercolor and a brush
- Optional: a teaspoon of unflavored gelatin dissolved in warm water

Steps

1. Tear scrap paper into small pieces and soak them in warm water for an hour.
2. With an adult, blend the soaked scraps with plenty of water into a smooth pulp (or mash them hard in a bowl). Pour the pulp into the basin of water and stir.
3. Slide the screen into the basin, under the pulp, and lift it out flat and level. Let the water drain. You should see an even layer of fibers.
4. Flip the screen onto a dish cloth and press with a sponge to release the wet sheet. Press out more water with a towel and let it dry flat overnight.
5. Optional: brush one dry sheet with warm gelatin water and let it dry. This is your sized sheet.
6. Now test: on each of the four papers (and your handmade sheets), make a pencil gradation, a charcoal patch, a marker line, and a watercolor stroke.

7. Record what happens: Did the marker feather? Did the watercolor sink in or sit on top? Did the charcoal grip? Did the paper buckle?
8. Write a conclusion for each paper: what is it good for and why (fiber, sizing, tooth or weight)?

Tips

- Add a few flower petals or threads to the pulp for decoration.
- If your sheet tears, the layer of pulp was too thin; lift a thicker layer next time.

Check your work

- ☐ I made at least one sheet of handmade paper.
- ☐ I tested at least four papers with four media.
- ☐ My notes explain the results using the words fiber, sizing, tooth and weight.
- ☐ I can explain why watercolor paper is thick and sized.

SKETCHBOOK PRACTICE

1. Look at the label on your sketchbook. What is the weight in gsm or pounds? Is it acid-free?
2. Draw the same leaf on smooth paper and on rough paper with charcoal. Describe the difference.
3. Find an old book or newspaper with yellowed pages and a newer one. Draw the edge of each and write why they differ.

From history. Hokusai's print used Prussian blue, a pigment first made by accident in Berlin around 1704 and later imported to Japan, where printmakers loved its deep, lasting color. Japanese papers made from the long fibers of mulberry bark are so strong that they could survive the pressure of being printed many times, once for each color block.

COMMON MISTAKES

- Using copy paper for watercolor or charcoal; it is too thin and too smooth.
- Thinking heavier always means better. Smooth, light paper is best for some fine pen work.
- Forgetting that the sides of paper can differ. Feel both sides and test before starting.

Make it a game • Paper Touch Test. Close your eyes while your parent hands you five papers: newsprint, cardstock, tissue, a paper bag and a smooth page. Feel each one and say whether it has more or less tooth, and whether it is light or heavy in weight. Guess the paper. Switch roles. Explain sizing and acid-free.

5.4 ERASERS, BLENDING TOOLS AND FIXATIVE

OBJECTIVES

- Explain how erasers work and choose the right eraser for a task.
- Use erasers and blending tools as drawing tools, not just for correcting mistakes.
- Understand what fixative is, how it works, and the safety rules for its use.

Warm-up. Shade a 3-inch square evenly with a 4B pencil. Using only a kneaded eraser, “draw” a simple object (a star, a moon, a key) into the gray by lifting tone out. Then sharpen the edges with a vinyl eraser.

WATCH

The Beginner's Guide to Drawing Erasers

Art Expedition • 4:52

<https://www.youtube.com/watch?v=F9OlZeHfmkw>

WHEN TO WATCH

During the first session, before the eraser tests. He shows what rubber, gum, kneaded and vinyl erasers are made of and how each one lifts graphite; then try each on your own value scale.

BACKUP VIDEO

How to use fixative spray - DOs and DON'Ts

Photorealist Art with Tom Mulliner • 5:40

<https://www.youtube.com/watch?v=uPRE3F1MDDc>

Watch in the second session with a parent before any fixative is used. A parent should do the spraying.

KEY TERMS

kneaded eraser

A soft, putty-like eraser that lifts graphite and charcoal by pressing and can be shaped to a point or edge; it leaves no crumbs.

vinyl eraser

A firm white plastic eraser that removes marks thoroughly and makes clean edges, but can rough up the paper if overused.

blending stump

A tightly rolled stick of soft paper, pointed at the ends, used to smooth and blend graphite, charcoal and pastel.

fixative

A thin resin dissolved in a fast-drying solvent and sprayed as a mist; when the solvent evaporates, the resin glues loose particles to the paper.

pastel

Sticks of nearly pure powdered pigment held together with a very small amount of binder, so they are very bright and very powdery.

CORE IDEAS

Before erasers, artists rubbed out pencil lines with lumps of fresh bread. In 1770 the English scientist Joseph Priestley noticed that a piece of the new substance from South America, the dried sap of the rubber tree, would “rub out” pencil marks, and so it was named **rubber**. Raw rubber rotted and grew sticky in heat, until in 1839 Charles Goodyear discovered how to cure it with sulfur and heat, making a durable material.

An eraser works because it is **stickier to graphite or charcoal than the paper is**. As you rub, the eraser’s surface grips the loose particles and pulls them away; then bits of the eraser crumble off, carrying the particles with them. That is why erasers leave crumbs, and why a dirty eraser smears. A **kneaded eraser** is made of a soft, unhardened rubber or putty that stays sticky; you press and lift instead of rubbing, and you clean it by kneading it until the gray disappears inside. A **vinyl** eraser removes more thoroughly and makes crisp edges, but rubbing too hard can scuff the paper’s surface and sizing, so the area will no longer take tone evenly. A soft **gum** eraser crumbles easily and is very gentle.

Erasers are drawing tools. With a kneaded eraser shaped to a point you can lift highlights, soften edges and lighten a whole area. A **blending stump** smooths tone into soft gradations without the oil from your fingers. Use blending carefully: too much makes drawings look smeared and lifeless. Many masters left their strokes visible.

Fixative protects drawings made of loose particles: charcoal, soft graphite and especially **pastel**. Pastels are mostly pure pigment with only a whisper of binder, which is why they are so brilliant and so fragile. Fixative is sprayed as a fine mist of resin dissolved in solvent; when the solvent evaporates, a thin film of resin glues the particles down. *Workable* fixative lets you keep drawing on top; *final* fixative is for the finished piece. Fixative slightly darkens and dulls pastel, so many pastel artists use it sparingly or not at all and frame their work under glass instead.

Safety: fixative fumes are harmful to breathe and the spray is flammable. Only an adult should spray it, outdoors, away from any flame, in still air, holding the can about a foot from the drawing and using light coats. Students should stand well back. A safe alternative is simply to store drawings flat with a sheet of tracing paper or clean paper over them. Hairspray is not a good substitute: it can yellow and does not protect well.

PICTURE STUDY



The Chocolate Girl, Jean-Étienne Liotard, about 1744–1745 · Pastel on parchment · Gemäldegalerie Alte Meister, Dresden

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

Liotard was a Swiss artist who worked across Europe, famous for pastels so smooth and exact that they look almost like photographs. This maid carrying hot chocolate is his best-known work. It is made of powdery pastel on parchment (thin animal skin), and it has survived nearly 300 years under glass.

Look closely

- Look at the glass of water. How did Liotard show that it is transparent?
- Find the softest blends and the crispest edges. Where are they?
- Look at the folds of the apron. How many values of white and gray can you count?
- Notice the plain background. Why might Liotard have kept it so simple?

Talk about it

1. Pastel is very fragile. How do you think this picture has lasted so long?
2. Liotard leaves almost no visible strokes. Do you prefer smooth blending or visible marks? Why?
3. Why might an artist choose to paint an ordinary maid rather than a queen?

STUDIO PROJECT

A Drawing Made with Erasers

You will draw a still life in which the erasers and blending tools do much of the work: you will lay down tone, then lift, sculpt and soften it. You will also test three erasers and record how they work.

You will need

- Drawing paper, 11×14 in
- 4B or 6B pencil and vine charcoal
- Kneaded eraser, vinyl eraser, and a gum eraser (if you have one)
- Blending stump and tissues
- A white or glass object (a white cup, a glass of water, an egg) and a lamp
- Tracing paper or a clean sheet for a cover

Steps

1. In one corner, test each eraser on a patch of graphite and a patch of charcoal: rub, dab, and edge. Note which removes most, which leaves crumbs, which damages the paper.
2. Set up your white or glass object under one lamp.
3. Lightly draw its outline. Then cover the whole object and its background with an even middle tone of vine charcoal or soft graphite, smoothed with a tissue.
4. With a kneaded eraser shaped to a flat edge, lift out the large light planes of the object.
5. Pinch the eraser to a point and lift the highlights and the bright reflections (on glass, they are sharp and small).
6. Add the darks with the soft pencil or charcoal.
7. Use the blending stump to soften turning edges; use the vinyl eraser to clean and sharpen a few key edges.
8. Leave some strokes visible. Do not blend everything.

9. Protect your drawing with a cover sheet. If your family has workable fixative, a parent may spray it outdoors following the safety rules while you watch from a distance.

Tips

- Knead the kneaded eraser often; a gray, dirty eraser puts tone back on.
- Glass shows the background through it. Draw what you see through and on the glass, not the idea of “clear.”

Check your work

- ☐ I tested and compared at least two erasers.
- ☐ My lights were lifted with an eraser, not left as untouched paper only.
- ☐ I used blending on purpose and left some strokes visible.
- ☐ My drawing is protected with a cover sheet, and no student sprayed fixative.

SKETCHBOOK PRACTICE

1. Make an eraser drawing on a toned patch: lift out three clouds and a moon.
2. Draw a glass of water from life and notice where the background bends through it.
3. Write a short safety card for fixative and tape it inside your art box.

From history. Pastel became fashionable in 1700s Europe, especially for portraits, because it needs no drying time and gives fresh, bright color. Liotard and the Venetian artist Rosalba Carriera were among its masters. Because pastel is so fragile, most pastel works are kept under glass and rarely travel.

COMMON MISTAKES

- Scrubbing with a vinyl eraser until the paper is damaged; the area will never shade evenly again.
- Blending everything until the drawing looks smeared.
- Spraying fixative indoors or too close, which is unsafe and leaves blotches.

Make it a game • Right Tool, Fast. Your parent names a drawing task: lift a highlight, soften an edge, remove a hard line, blend a gradient, or protect a finished drawing. You name the right tool in five seconds: kneaded eraser, vinyl eraser, blending stump or fixative. Score each correct choice. Ten rounds, then switch.

UNIT 5

MATERIAL SCIENCE: DRAWING MEDIA

Every mark you make is a small piece of chemistry and physics. A pencil line is millions of flakes of carbon sheared off a crystal and caught in the fibers of paper. A charcoal smudge is what is left of a burned twig. An eraser works by being stickier than paper. In this unit you will learn what your drawing materials are made of, how they are made, and why they behave the way they do.

Knowing your materials is part of craftsmanship. It tells you which pencil to reach for, which paper will take a wash, why a drawing smudges, and how to keep your work safe for years. You will test each material with your own hands and record the results like a scientist, and you will meet the masters who used these same materials: Dürer's silverpoint and charcoal, Hokusai's paper, and Liotard's pastels.

PREREQUISITES

- Has used graphite pencils of several grades and charcoal (Unit 4)
- Can make a value scale
- Keeps a sketchbook for notes

MASTERY CHECKLIST

- ☐ I can explain what pencil "lead" is made of and what H and B mean.
- ☐ I can explain how charcoal is made and the difference between vine and compressed charcoal.
- ☐ I can describe how paper is made and what fiber, sizing, tooth and weight mean.
- ☐ I can choose the right eraser for a job and explain how erasers work.
- ☐ I know how fixative works and the safety rules for using it.

LESSONS IN THIS UNIT

5.1 Graphite: How Pencils Are Made

2 sessions of 50 minutes

5.2 Charcoal: Vine and Compressed

2 sessions of 50 minutes

5.3 Paper: Fiber, Sizing and Tooth

2 sessions of 50 minutes

5.4 Erasers, Blending Tools and Fixative

2 sessions of 50 minutes

UNIT 5 REVIEW

Answer each question. Questions 11 and 12 should be written in complete sentences. Your test charts from this unit may be used for reference. 100 points total.

1. (7 pts)

What is pencil “lead” really made of?

2. (7 pts)

Why does graphite leave a mark on paper?

3. (7 pts)

What do H and B mean, and what makes a pencil harder or softer?

4. (7 pts)

What is silverpoint, and why could Dürer not erase his self-portrait?

5. (7 pts)

How is charcoal made, and why does it not turn to ash?

6. (7 pts)

Compare vine charcoal and compressed charcoal. When would you use each?

7. (7 pts)

How is paper made? Name the main steps.

8. (7 pts)

What is sizing, and what would happen to ink on paper without it?

9. (7 pts)

What is the difference between hot press and cold press paper?

10. (7 pts)

How does an eraser work, and why does a kneaded eraser leave no crumbs?

11. (15 pts)

Written answer: Explain what fixative is, how it works, and list at least four safety rules for using it.

12. **15 pts**

Written answer: You want to make a large charcoal drawing that will last many years. Describe which charcoal, paper and eraser you would choose and why, using what you learned about each material.

ANSWER KEY

1. Graphite (a form of carbon) mixed with clay, fired, and soaked in wax; there is no lead.
2. Its carbon atoms form flat sheets that slide apart easily, so the paper's tooth scrapes off flakes that lodge in the fibers.
3. H is hard, B is black/soft. More clay makes it harder and lighter; more graphite makes it softer and darker.
4. Drawing with a silver stylus on paper coated with a gritty ground; the silver lines are bonded to the ground and cannot be erased.
5. Wood is heated in a sealed container with little air; water and gases leave but there is not enough oxygen to burn, so carbon remains.
6. Vine is soft, gray, has no binder and erases easily, good for the first lay-in. Compressed is powder plus binder, darker and harder to erase, good for final darks.
7. Plant fibers are beaten in water into pulp; a screen (mould) lifts out a thin layer; water drains and fibers interlock; the sheet is pressed and dried.
8. A substance like gelatin or starch that slows absorbency; without it ink would bleed and feather into blots.
9. Hot press is pressed with hot rollers and smooth; cold press keeps a light texture (more tooth).
10. It is stickier to graphite or charcoal particles than the paper is, gripping them and carrying them off in crumbs. A kneaded eraser stays soft and sticky and holds the particles inside as you knead it.
11. Model: Fixative is a thin resin dissolved in a fast-evaporating solvent, sprayed as a mist; when the solvent evaporates, the resin film glues loose charcoal, graphite or pastel particles to the paper. Safety: only an adult sprays it; outdoors in still air; away from any flame; hold the can about a foot away and spray light coats; students stand back and do not breathe the mist.
12. Model: I would choose heavy, acid-free drawing or charcoal paper with good tooth, because tooth holds charcoal particles and acid-free paper will not yellow or crumble. I would lay in with vine charcoal, which erases easily, and finish darks with compressed charcoal, which has a binder and makes deep blacks. I would use a kneaded eraser to lift lights without damaging the paper. When

finished, I would protect it with a cover sheet or have an adult spray fixative outdoors, and store it flat.

PORTFOLIO PIECE: A MIXED DRAWING MEDIA STUDY

Make one finished drawing (11×14 in or larger) of a natural or household subject that uses at least three drawing media from this unit on purpose: for example, hard graphite for the delicate parts, charcoal for deep darks, and a kneaded eraser to lift lights, on a paper you chose for its tooth. Attach a short materials label on the back, like a museum label, listing each material and why you chose it.

LOOK FOR	WHAT IT MEANS
Choice of materials	At least three media are used, each for a job it does well.
Paper choice	The paper suits the media (tooth, weight), and the choice is explained.
Value and form	A full value range with convincing form and a single light source.
Craftsmanship and care	No accidental smudges; the drawing is protected with a cover sheet; signed and dated.
Materials label	The label accurately names each material and gives a correct reason for each choice.

UNIT 6

PERSPECTIVE

Perspective is a set of drawing methods that make a flat page look deep, discovered and written down by Italian artists and architects in the early 1400s. You may already know one-point perspective, where a road or hallway runs straight away from you. This unit adds **two-point perspective**, for things seen corner-first, and introduces **three-point perspective**, for looking steeply up at a tower or down from a height.

Perspective is not only lines and rulers. Distance also changes value, color, edges and detail, which is called **atmospheric perspective**. You will put both kinds together in a finished drawing of a street, the way the French painter Gustave Caillebotte did in his great rainy-day view of Paris.

PREREQUISITES

- Knows one-point perspective: horizon line, vanishing point, orthogonals
- Can use a ruler and draw light guidelines
- Knows the basic idea of atmospheric color from Lesson 3.4

MASTERY CHECKLIST

- ☐ I can draw boxes and buildings in two-point perspective above, on and below the horizon line.
- ☐ I can explain when to use one-, two- or three-point perspective.
- ☐ I can draw a simple tower in three-point perspective.
- ☐ I can use value, contrast, detail and size to show distance.
- ☐ I can draw a street scene with correct eye level and figures that fit the space.

LESSONS IN THIS UNIT

6.1 Two-Point Perspective

2 sessions of 50 minutes

6.2 Three-Point Perspective

2 sessions of 50 minutes

6.3 Atmospheric Perspective

2 sessions of 50 minutes

6.4 Drawing a Street

2 sessions of 50 minutes

UNIT 6 REVIEW

Answer each question. You may draw a diagram to help explain any answer.
Questions 11 and 12 should be written in complete sentences. 100 points total.

1. (7 pts)

What is the horizon line in a perspective drawing?

2. (7 pts)

When do you use two-point perspective instead of one-point?

3. (7 pts)

In two-point perspective, what happens to vertical lines?

4. (7 pts)

A box is drawn above the horizon line. Can you see its top or its bottom?

5. (7 pts)

Why should vanishing points be placed far apart?

6. (7 pts)

What is three-point perspective, and when would you use it?

7. (7 pts)

In a bird's-eye view, where is the third vanishing point?

8. (7 pts)

Name four ways atmospheric perspective changes distant objects.

9. (7 pts)

What is the eye-level rule for drawing people on flat ground?

10. (7 pts)

Why did Saenredam keep the columns vertical in his church paintings?

11. 15 pts

Written answer: Explain how Bierstadt shows great depth in *Among the Sierra Nevada, California*. Use at least three ideas from atmospheric or linear perspective.

12. 15 pts

Written answer: Describe how Caillebotte used perspective in *Paris Street; Rainy Day*. Mention eye level, vanishing points and the lamp post.

ANSWER KEY

1. A horizontal line at the viewer's eye level.
2. When an object is seen corner-first, so two sets of edges recede from the viewer.
3. They stay perfectly vertical.
4. Its bottom.
5. Close vanishing points stretch and distort the objects.
6. Vertical lines also converge toward a third vanishing point above or below; used when looking steeply up (worm's-eye) or down (bird's-eye).
7. Far below the horizon (below the picture).
8. Lighter darks, less contrast, less detail, softer edges, cooler and grayer (bluer) color.
9. The heads of standing people about your height line up on the horizon line at any distance.
10. Converging verticals can make a building seem to tip; vertical columns keep the space calm and dignified.
11. Model: Bierstadt divides the valley into planes. The foreground trees and rocks are darkest, sharpest and most detailed, while the far peaks are pale, bluish and soft-edged, close in value to the sky. Things overlap and get smaller and higher on the canvas as they recede; the tiny animals by the lake show the huge scale of the cliffs. The sunlit distant peaks glow through the haze, pulling the eye deep into the scene.
12. Model: The eye level is at the height of the walking figures' heads, so near and far people all have their heads near the horizon line. The central wedge building shows two sides receding to two widely spaced vanishing points, and the streets and cobblestones recede as well, with stones growing smaller and less distinct. The tall lamp post divides the picture into two halves, separating the close figures from the open square. The rainy air softens the distant buildings.

PORTFOLIO PIECE: A BUILDING OR STREET FROM LIFE

Draw a real building, church, street corner or farm in your area from life (or from your own photo and sketches), using two-point perspective and atmospheric perspective. Choose a viewpoint that shows the building corner-first. Include at least one figure or tree placed correctly in the space, and finish with shading that shows one light direction.

LOOK FOR	WHAT IT MEANS
Linear perspective	One horizon line, two vanishing points, and all receding lines and verticals correct.
Atmospheric perspective	Distant parts are lighter, softer and less detailed than near parts.
Scale and figures	People or trees are placed with the eye-level rule and look the right size.
Composition	A planned thumbnail and a clear focal point; the drawing fills the page.
Craftsmanship	Guidelines erased, confident lines, consistent shading, signed and dated.

6.1 TWO-POINT PERSPECTIVE

OBJECTIVES

- Draw boxes in two-point perspective using a horizon line and two vanishing points.
- Show how the view changes when a box is above, on or below eye level.
- Draw a simple building with a pitched roof, door and windows in two-point perspective.

Warm-up. Stand at the corner of a table or a box and look at it from the side so you see two faces. Hold your pencil horizontally at eye level. Do the top edges slope up or down toward the pencil? Sketch the box in one minute, paying attention only to those slopes.

WATCH

Two Point Perspective

Drawing & Painting - The Virtual Instructor · 11:50

https://www.youtube.com/watch?v=1Fcbk_K5qWA

WHEN TO WATCH

After the core ideas. Draw along, pausing the video after each box.

BACKUP VIDEO

How to Draw a House using Two Point Perspective for Beginners

Circle Line Art School · 5:34

<https://www.youtube.com/watch?v=wZbTBgUSn7o>

During the studio project, for the steps of drawing a house and roof.

KEY TERMS

horizon line

A horizontal line across the picture at the viewer's eye level; also called the eye level.

vanishing point

A point on the horizon line where parallel lines going away from the viewer appear to meet.

two-point perspective

A method for drawing objects seen corner-first, with two sets of receding lines going to two vanishing points.

leading edge

The vertical edge of a box or building nearest the viewer; it is drawn first and is the tallest.

orthogonal

A guideline drawn from a point on an object to a vanishing point.

CORE IDEAS

Railroad tracks are parallel, yet they seem to meet far away. All of linear perspective comes from this simple fact: **parallel lines going away from you appear to come together at a vanishing point on your eye level.** In one-point perspective you face the object squarely, so one set of lines goes away from you and the rest stay flat or vertical. When you turn so that you see an object **corner-first**, two sets of lines go away from you, one to the left and one to the right. Each set has its own vanishing point. That is **two-point perspective**.

To draw a box: draw a horizon line across the page and put a vanishing point near each end. Draw a vertical line for the **leading edge**, the corner closest to you. From its top and bottom, draw light guidelines (orthogonals) to both vanishing points. Draw two more vertical lines to show where the sides end. Then connect the tops of those verticals to the opposite vanishing points to find the back edges. All vertical lines stay perfectly vertical.

Where the box sits compared with the horizon changes what you see. A box **below** eye level shows its top (you look down on it). A box **above** eye level shows its bottom (you look up at it). A box that the horizon line passes through shows neither; that is how buildings look when you stand on the street, with your eye level at about the height of a person's head.

Keep the vanishing points **far apart**, near or even beyond the edges of the paper. If they are too close, boxes look stretched and twisted. Use a ruler and keep guidelines very light so you can erase them. Once you can draw a box, you can draw almost any building: add a roof by finding the center of the end wall (where the diagonals cross) and raising a peak above it, and place windows and doors with lines to the same vanishing points.

The young Turner learned all of this as a teenager from an architectural draftsman, and his watercolor of Lambeth Palace, made at fifteen, shows buildings set at different angles, each with its own vanishing points.

PICTURE STUDY



A View of the Archbishop's Palace, Lambeth, J. M. W. Turner, 1790 · Watercolor on paper · Indianapolis Museum of Art, Indiana

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

Turner was only fifteen when this watercolor was accepted for the Royal Academy exhibition in London, the first of his works ever shown there. His teacher was an architectural artist named Thomas Malton, and the picture shows how well the boy had learned perspective.

Look closely

- Find the eye level. Look at the heads of the figures in the street. About how high is the horizon?
- Choose one building. Which way do its top edges slope? Do they go toward the horizon?
- Find a building or wall seen corner-first. Can you imagine where its two vanishing points would be?
- Look at the vertical edges of the buildings. Are they straight up and down?

Talk about it

1. The buildings face different directions. Why does that make the perspective harder to draw?
2. How do the small figures help you feel the size of the buildings?

3. What does this watercolor tell you about how hard Turner worked as a boy?

STUDIO PROJECT

A Farmhouse and Barn in Two-Point Perspective

You will draw two buildings in two-point perspective, a house and a barn or shed, which share the same horizon and vanishing points, with roofs, doors and windows.

You will need

- Drawing paper, 11×14 in, turned sideways
- Ruler (18 in if possible)
- 2H and HB pencils
- Eraser
- Colored pencils or fine black pen (optional)

Steps

1. Draw a light horizon line about one-third up from the bottom. Put a vanishing point at each far end, at the very edges of the paper.
2. Draw the leading edge of the house: a vertical line crossing the horizon, about 3 inches tall, left of center.
3. Draw orthogonals from its top and bottom to both vanishing points. Choose where the side walls end and draw two more verticals.
4. For the roof: on the end wall, draw an X from corner to corner to find the center, draw a vertical up from it, and mark the peak. Connect the peak to the two top corners. Draw a line from the peak toward the vanishing point on the other side to make the ridge, and finish the far roof edge.
5. Draw a smaller barn or shed farther back and to the right, using the same horizon and vanishing points. It will be smaller because it is farther away.
6. Add doors and windows: draw their vertical sides straight up and down, and their top and bottom edges toward the correct vanishing point.
7. Add a path or fence that goes back toward one vanishing point.
8. Erase your guidelines carefully. Darken the final lines and add shading: choose a light direction and make one side of each building darker.

9. Add details like shingles, boards or bricks, with their lines going to the vanishing points.

Tips

- If something looks wrong, check that every receding line really goes to a vanishing point.
- Use a strip of tape on the table to mark vanishing points that fall off the paper.

Check your work

- ☐ Both buildings share one horizon and two vanishing points.
- ☐ All vertical edges are vertical.
- ☐ Windows, doors and roof lines go to the correct vanishing points.
- ☐ The farther building is smaller.

SKETCHBOOK PRACTICE

1. Draw a box below, on and above the horizon line. Label what you see of each (top, neither, bottom).
2. Draw a stack of three books in two-point perspective.
3. Sit at the corner of your house or a room and sketch it from life. Find the eye level first.

From history. The architect Filippo Brunelleschi showed how linear perspective works in Florence around 1415, with a painted panel of the Baptistery viewed through a peephole and a mirror. In 1435 Leon Battista Alberti wrote the first book explaining perspective to painters.

COMMON MISTAKES

- Vanishing points too close together, which distorts the boxes.
- Slanted vertical lines. In two-point perspective, verticals stay vertical.
- Drawing the back edges to the wrong vanishing point. Each back edge goes to the vanishing point on the opposite side.

Make it a game • Eye-Level Elevator. Set a shoebox on the floor, a table and a high shelf. At each height, crouch or stand and say what you see: the top, the bottom or neither. Name where the horizon line is and how the vanishing points shift. Draw your best view in sixty seconds. Never stand on anything wobbly.

6.2 THREE-POINT PERSPECTIVE

OBJECTIVES

- Explain when and why vertical lines converge in three-point perspective.
- Draw a tall building or tower from a worm's-eye view with three vanishing points.
- Compare how artists show tall spaces with and without a third vanishing point.

Warm-up. Stand at the bottom of a tall object (a tree, a flagpole, a tall door or building) and look straight up. Hold your pencil vertical. Do the sides of the object look parallel, or do they lean together toward the top? Sketch what you see.

WATCH

How to Draw 3-Point Perspective for Beginners: Narrated

Circle Line Art School · 6:15

<https://www.youtube.com/watch?v=iu2iZf8Jyfk>

WHEN TO WATCH

During the studio project. Pause after each step and draw along.

BACKUP VIDEO

How to Draw in 3-Point Perspective: Narrated

Circle Line Art School · 8:26

<https://www.youtube.com/watch?v=EPBaHkj753I>

Optional, a second worm's-eye building drawn step by step.

KEY TERMS

three-point perspective

A method in which vertical lines also converge, toward a third vanishing point far above or below the horizon.

bird's-eye view

A view looking steeply down, as from a tower or airplane; the third vanishing point is far below.

worm's-eye view

A view looking steeply up, as from the ground beside a tall building; the third vanishing point is high above.

picture plane

The imaginary flat window, the surface of your paper, through which you look at the scene.

CORE IDEAS

In two-point perspective, vertical lines stay perfectly vertical. That works well when you look straight ahead, because the vertical edges of buildings are then roughly parallel to your picture plane. But if you tilt your head back to look up a tall tower, its vertical edges are now going away from you too, and like all parallel lines going away, they appear to converge. That is **three-point perspective**: the two vanishing points on the horizon plus a third, far above (looking up) or far below (looking down).

In a **worm's-eye view**, the horizon line is low on the page, often near the bottom or even below it, and the third vanishing point is high above the top of the paper. Buildings look as if they are towering and tapering upward. In a **bird's-eye view**, the horizon is high and the third vanishing point is far below; buildings seem to shrink toward the ground, as if you were in a hot-air balloon.

To draw a worm's-eye box: put two vanishing points on a low horizon line, far apart, and a third vanishing point high above the center. Draw the leading edge as a line pointing toward the third point. Draw guidelines from the bottom of that edge to the two horizon vanishing points. The side edges also lean toward the third point. Then connect the tops to the side vanishing points as before.

Three-point perspective creates drama: it makes things feel enormous or makes the viewer feel high up. But many painters chose not to use it. Architectural painters such as Pieter Saenredam kept the vertical lines of tall churches straight, even when showing soaring columns, because converging verticals can make a building look as if it is tipping over. Choosing which system to use is an artistic decision.

Use one-point when you face a scene squarely, two-point when you see things corner-first at a normal eye level, and three-point when you look steeply up or down.

PICTURE STUDY



Interior of St Bavo's Church in Haarlem, Pieter Jansz Saenredam, 1636 · Oil on panel · Rijksmuseum, Amsterdam

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

Saenredam spent his life painting the insides of Dutch churches. He visited them, measured them, made careful construction drawings, and then painted them slowly, sometimes years later. His paintings are filled with calm light and soaring height.

Look closely

- Find the tiny figures on the floor. Where is the eye level?
- Look at the vertical columns. Do they lean toward each other at the top, or stay straight up and down?
- Find the arches and windows that go back into the distance. How much smaller do they get?
- Notice how much of the picture is pale, empty space.

Talk about it

1. Saenredam kept the columns vertical. How would the church feel if they leaned together toward a third vanishing point?
2. How does he make the church feel very tall without using three-point perspective?

3. Why might pale light and empty space feel peaceful and fitting for a church?

STUDIO PROJECT

A Tower from Below

You will draw a tall building, such as a church tower, a lighthouse or a city building, from a worm's-eye view, using three vanishing points.

You will need

- Drawing paper, 11×14 in, turned tall
- Long ruler or straight edge
- 2H and HB pencils
- Eraser
- Masking tape and scrap paper (to extend the page for far vanishing points)
- Fine black pen and colored pencils (optional)

Steps

1. Tape a strip of scrap paper above the top of your drawing paper so you have room for the third vanishing point.
2. Draw a horizon line near the bottom of the drawing paper. Put two vanishing points on it, far apart (at or beyond the edges).
3. Mark the third vanishing point high above the center, on the scrap strip.
4. Draw the leading edge of the tower as a line from a point just above the horizon up toward the third vanishing point.
5. From the bottom of the leading edge, draw guidelines to the left and right vanishing points. Mark the bottom corners of the two visible walls.
6. From those corners, draw lines up toward the third vanishing point. These are the side edges of the tower.
7. Choose the height of the tower. From the top of the leading edge, draw lines to the left and right vanishing points to find the top edges.
8. Add windows, bands of stone or floors: horizontal lines go to the left and right vanishing points, and vertical edges lean toward the third.

9. Add a pointed roof, battlements or a spire on top. Erase guidelines and shade one side darker than the other.

Tips

- Keep the third vanishing point far away. If it is too close, the tower will look sharply pointed and distorted.
- Turn your drawing upside down to imagine a bird's-eye view of the same building.

Check your work

- ☐ My drawing has three vanishing points.
- ☐ The vertical edges lean toward the third vanishing point.
- ☐ Windows and floors follow the correct guidelines.
- ☐ The tower feels tall, as if I am looking up at it.

SKETCHBOOK PRACTICE

1. Draw a box in a bird's-eye view, looking down from above.
2. Lie on the floor and sketch a tall piece of furniture or a doorway from below.
3. Draw the same tall building twice: once in two-point and once in three-point. Write which feels more dramatic.

From history. Three-point perspective became common in illustration in the 1900s, when skyscrapers and airplanes gave artists new views looking steeply up and down. Earlier painters knew that verticals could converge but usually chose to keep them straight for calm and dignity.

COMMON MISTAKES

- Placing the third vanishing point too close, causing extreme distortion.
- Mixing systems: some verticals vertical, others leaning. Choose one.
- Forgetting that windows also follow the third vanishing point.

Make it a game • Worm or Bird?. Lie on the floor and look up at a corner of the ceiling, then look down at a table from above. Say which is a worm's-eye view and which a bird's-eye view. Point to where the vertical lines seem to converge. Your parent then describes scenes while you call each one.

6.3 ATMOSPHERIC PERSPECTIVE

OBJECTIVES

- List the ways distance changes value, contrast, detail, edges and color.
- Draw a landscape in graphite with at least three distinct planes of distance.
- Explain how Bierstadt created great depth in a mountain landscape.

Warm-up. Look out a window at something near (a bush or fence) and something far (trees or hills). Draw a 2-inch square of each, matching the darkest value you can see in each. Which square has darker darks?

WATCH

How to Draw a Landscape using Atmospheric Perspective

Circle Line Art School · 6:27

https://www.youtube.com/watch?v=M_HG8yn7KJ8

WHEN TO WATCH

Before the studio project. Watch how the far hills are drawn lighter and with less detail.

BACKUP VIDEO

Perspective Drawing - 05: Atmospheric Perspective

Matt Laskowski (fox-orian) · 3:29

<https://www.youtube.com/watch?v=3J2ZpJXyIQQ>

Optional, a short explanation of the main rules.

KEY TERMS

atmospheric perspective

Showing distance by making far things lighter, lower in contrast, less detailed, softer-edged and bluer. Also called aerial perspective.

foreground, middle ground, background

The near, middle and far zones of a picture.

plane of distance

A band of the landscape at roughly the same distance, such as the near field or the far mountains.

contrast

The difference between the lightest and darkest values in an area.

CORE IDEAS

Linear perspective uses lines; **atmospheric perspective** uses the air. Between you and a distant mountain lie miles of air full of tiny droplets of water and specks of dust. They scatter light, especially blue light, and lay a thin veil over everything far away. Leonardo da Vinci studied this carefully and called it the “perspective of disappearance.”

Distance changes a thing in five ways. Its **darks get lighter** (a black-green pine becomes blue-gray on a far hill). Its **contrast drops**, so the lights and darks move closer together. Its **detail disappears**: you see individual leaves nearby, only shapes of trees far off. Its **edges soften**. And in color, it becomes **cooler and grayer**, shifting toward the color of the sky. Add the effects of linear perspective (far things are smaller and higher on the page, and they are overlapped by near things) and you have a strong illusion of depth.

Painters organize landscapes into **planes of distance**, usually at least three: foreground, middle ground, background. Give each plane its own value range. The foreground has the full range, from the darkest dark to the lightest light, with crisp edges and detail. The middle ground has a narrower range and simpler shapes. The background is a pale, soft, almost flat silhouette, close in value to the sky.

A common mistake is to draw distant mountains with dark outlines and strong detail, which pulls them forward. Draw the farthest things first, very lightly, and build darker, sharper, more detailed planes in front of them. In graphite, a hard pencil (2H or HB) is good for the background and soft pencils (2B to 6B) for the foreground.

The heavens and the hills were made to be seen far off. Atmospheric perspective is simply learning to draw what the air does to them.

PICTURE STUDY



Among the Sierra Nevada, California, Albert Bierstadt, 1868 · Oil on canvas · Smithsonian American Art Museum, Washington, D.C.

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

Bierstadt was a German-born American painter who traveled west with survey expeditions and painted the mountains on a huge scale. He painted this enormous canvas in Rome from his sketches, to show Europe the grandeur of the American West.

Look closely

- Divide the painting into foreground, middle ground and background. Where are the darkest darks?
- Compare the edges of the trees in front with the edges of the farthest peaks.
- Look at the color of the far mountains. How close is it to the color of the sky?
- Find the animals by the water. How big are they compared with the cliffs?

Talk about it

1. How does Bierstadt make you feel the great distance across the valley?
2. Why do you think he put the sunlight on the far peaks rather than on the foreground?
3. What feeling does this painting give you about God's creation?

STUDIO PROJECT

Five Planes of Distance

You will draw a mountain or hill landscape in graphite with at least five layers of distance, each one darker, sharper and more detailed than the one behind it.

You will need

- Drawing paper, 9×12 in
- Graphite pencils: 2H, HB, 2B, 4B, 6B
- Kneaded eraser
- Blending stump or tissue
- Reference: your own sketches, the view from a window, or the picture study

Steps

1. Lightly draw a horizon line about halfway down. Above it, draw the outline of the farthest mountain range as a soft, irregular line.
2. Below and in front of it, draw four more overlapping ridges or hills, each lower on the page and closer to you. Add a lake, river or field if you like.
3. Shade the sky very lightly with the 2H, leaving a few white clouds.
4. Shade the farthest range with the 2H, only slightly darker than the sky. Blend it smooth with no detail.
5. Shade the next range with the HB, a little darker, with only a hint of shape (a few tree tops along its edge).
6. Shade the middle ranges with the 2B, with clearer tree shapes and a little contrast between light and shadow.
7. Draw the foreground with the 4B and 6B: individual trees, rocks or grasses, with the darkest darks and crisp edges.
8. Use the kneaded eraser to lift light where the sun touches a ridge, keeping lights on the far ranges soft and gentle.
9. Squint at the finished drawing. Each plane should step back clearly behind the one in front.

Tips

- Work from back to front.
- If a far range looks too close, lighten it with the kneaded eraser and soften its edge.

Check your work

- ☐ My drawing has at least five planes of distance.
- ☐ Each plane is lighter and softer than the one in front of it.
- ☐ The foreground has the darkest darks and most detail.
- ☐ The farthest range is close in value to the sky.

SKETCHBOOK PRACTICE

1. Draw the same tree three times: near, middle and far, changing value, detail and edge.
2. On a foggy or hazy day, sketch the view from a window and notice how quickly things fade.
3. Copy the background of the Mona Lisa or another Leonardo painting in a small value sketch.

From history. Leonardo wrote that a painter should make distant buildings paler and bluer, and that the edges of faraway things should be less distinct. Painters had used these effects before him, but he explained the reason: the thickness of air between the eye and the object.

COMMON MISTAKES

- Outlining distant mountains with dark lines.
- Giving every plane the same darkness and detail.
- Making the far range darker than the sky's lower edge, which pushes it forward.

Make it a game • Five Planes in Pencil. Draw five rolling hills in three minutes, front to back. Darken, sharpen and add detail to the nearest plane, and make each farther one paler and softer. Your parent checks for five changes: value, contrast, detail, edges and color. Each correct plane scores a point.

Scripture. “I will lift up mine eyes unto the hills, from whence cometh my help.” (Psalms 121:1, KJV)

The psalmist lifts his eyes to the far hills, and then past them to their Maker. Distant hills, softened by the air, have always drawn the eye and the heart upward.

6.4 DRAWING A STREET

OBJECTIVES

- Combine two-point and atmospheric perspective in one street scene.
- Place people correctly in a perspective space using the eye-level rule.
- Plan and draw a finished street scene with depth and a focal point.

Warm-up. Look at a photograph of people standing on a flat street (or go to a window overlooking a sidewalk). Draw a horizontal line through the heads of the people. Is the line the same height for near and far people?

WATCH

How to Draw using Two Point Perspective: Draw a Town Step-by-step

The Art Academy • 12:25

https://www.youtube.com/watch?v=eW5KPZio_by

WHEN TO WATCH

During the studio project. Watch the whole video first, then follow along, pausing often.

BACKUP VIDEO

How to draw a city streets in two point perspective

Learning basic Art • 8:43

<https://www.youtube.com/watch?v=cbZEfuR1XsY>

Optional, a second street-corner drawing.

KEY TERMS

eye level

The height of the viewer's eyes; the horizon line in a picture.

eye-level rule

On flat ground, the heads of standing people about your height line up on the horizon line, no matter how near or far they are.

street corner view

A view looking at a block of buildings corner-first, drawn in two-point perspective.

focal point

The area of greatest interest, where the eye goes first.

CORE IDEAS

A street is the perfect test of perspective, because it has everything: buildings seen corner-first in two-point perspective, a road and sidewalks receding to vanishing points, windows and doors repeating smaller and smaller, people near and far, and distance softening everything in the background.

The secret to fitting people into a street is the **eye-level rule**. If you are standing and the ground is flat, the eyes or heads of other standing adults about your height will be on the horizon line, whether they are next to you or a block away. Near people are large, with their feet far below the horizon; far people are small, with their feet just below it; but their heads stay on the line. Children's heads fall a little below it, and a person on a balcony is above it.

Use **atmospheric perspective** as well. Buildings at the end of the street should be lighter, lower in contrast and less detailed than the buildings close to you. A wet street, a hazy day or evening light makes this even stronger.

Plan the picture before drawing. Decide where the horizon is (at a person's eye level for a normal street view), where the two vanishing points are, and where the focal point will be: a corner café, a church door, a lamp post, a person under an umbrella. Make a thumbnail first, then build the large drawing with light guidelines.

Caillebotte, whose painting you will study, used a very wide view, with vanishing points far apart and a lamp post dividing the picture. He planned it with careful perspective drawings and studies of each figure.

PICTURE STUDY



Paris Street; Rainy Day, Gustave Caillebotte, 1877 · Oil on canvas · Art Institute of Chicago

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

Caillebotte painted a newly built part of Paris, with wide streets and tall, uniform buildings, on a gray, rainy day. The painting is huge, nearly 7 by 9 feet, so the near figures are almost life-size. It is a masterpiece of perspective.

Look closely

- Find the eye level. Draw an imaginary line through the heads of the people near and far. What do you notice?
- Look at the wedge-shaped building in the middle. Can you see its two sides going toward two vanishing points?
- Find the lamp post. What does it do to the picture?
- Compare the cobblestones near the bottom with those far away. How do they change?

Talk about it

1. How does the gray, rainy atmosphere change the buildings in the distance?
2. Why might Caillebotte have cut off the man on the far right at the edge of the picture?
3. Does this street feel crowded or spacious? What makes it feel that way?

STUDIO PROJECT

My Street Corner

You will draw a street corner in two-point perspective, with at least three buildings, a sidewalk, people placed by the eye-level rule, and atmospheric perspective in the distance.

You will need

- Drawing paper, 11×14 in or larger
- Long ruler
- 2H, HB, 2B and 4B pencils
- Kneaded and vinyl erasers
- Fine black pen and colored pencils or watercolor (optional)
- Sketchbook for thumbnails

Steps

1. In your sketchbook, make two thumbnails of a street corner: one with the corner building in the center, one with it off to the side. Choose the stronger design and decide on a focal point.
2. On the large paper, draw a horizon line at about one-third of the page height. Place the vanishing points far apart, at or beyond the edges.
3. Draw the leading edge of the corner building and its two side walls with orthogonals. Add buildings along both streets, going back toward each vanishing point and getting shorter as they recede.
4. Draw the sidewalks and curbs with lines to the vanishing points. Add a lamp post, a tree or a sign to add interest.
5. Add windows, doors and awnings with their edges going to the correct vanishing points. Use more detail on the near buildings, less on the far ones.
6. Place at least four people: draw a small oval head on the horizon line for each one, then draw the body down to the feet, larger for near people and smaller for far ones.
7. Erase guidelines. Add shading with one light direction.
8. Make the far buildings lighter and softer than the near ones.

9. Add color if you wish, with the strongest color at your focal point.

Tips

- Draw the people as simple shapes first: an oval head and a long bean-shaped body.
- Check every receding line with the ruler before darkening it.

Check your work

- ☐ My buildings use one horizon line and two vanishing points.
- ☐ The heads of standing people sit on the horizon line.
- ☐ Far buildings are lighter and less detailed than near ones.
- ☐ My picture has a clear focal point.

SKETCHBOOK PRACTICE

1. Draw ten people at different distances on a flat ground, all with heads on the same horizon line.
2. Sketch the outside of your house or a building in your town from life, finding the eye level first.
3. Copy the central wedge building from *Paris Street; Rainy Day* in two-point perspective.

From history. Caillebotte was a wealthy painter who used his money to support his friends among the Impressionists, buying their paintings when no one else would. He left his collection to the French nation, and many of the Impressionist paintings in the Musée d'Orsay in Paris came from him.

COMMON MISTAKES

- People floating or sinking because their heads are not on the eye level.
- Far buildings drawn with the same dark lines and detail as near ones.
- Too many vanishing points. All buildings parallel to each other share the same two.

Make it a game · Heads on the Horizon. Draw a horizon line and a simple street. Your parent calls 'near,' 'far,' 'very far.' Quickly draw a person at each distance with their head touching the eye-level line. Say why the eye-level rule works. Switch and let your parent draw while you check. Fastest correct street wins.

UNIT 6

PERSPECTIVE

Perspective is a set of drawing methods that make a flat page look deep, discovered and written down by Italian artists and architects in the early 1400s. You may already know one-point perspective, where a road or hallway runs straight away from you. This unit adds **two-point perspective**, for things seen corner-first, and introduces **three-point perspective**, for looking steeply up at a tower or down from a height.

Perspective is not only lines and rulers. Distance also changes value, color, edges and detail, which is called **atmospheric perspective**. You will put both kinds together in a finished drawing of a street, the way the French painter Gustave Caillebotte did in his great rainy-day view of Paris.

PREREQUISITES

- Knows one-point perspective: horizon line, vanishing point, orthogonals
- Can use a ruler and draw light guidelines
- Knows the basic idea of atmospheric color from Lesson 3.4

MASTERY CHECKLIST

- ☐ I can draw boxes and buildings in two-point perspective above, on and below the horizon line.
- ☐ I can explain when to use one-, two- or three-point perspective.
- ☐ I can draw a simple tower in three-point perspective.
- ☐ I can use value, contrast, detail and size to show distance.
- ☐ I can draw a street scene with correct eye level and figures that fit the space.

LESSONS IN THIS UNIT

6.1 Two-Point Perspective

2 sessions of 50 minutes

6.2 Three-Point Perspective

2 sessions of 50 minutes

6.3 Atmospheric Perspective

2 sessions of 50 minutes

6.4 Drawing a Street

2 sessions of 50 minutes

UNIT 6 REVIEW

Answer each question. You may draw a diagram to help explain any answer.
Questions 11 and 12 should be written in complete sentences. 100 points total.

1. (7 pts)

What is the horizon line in a perspective drawing?

2. (7 pts)

When do you use two-point perspective instead of one-point?

3. (7 pts)

In two-point perspective, what happens to vertical lines?

4. (7 pts)

A box is drawn above the horizon line. Can you see its top or its bottom?

5. (7 pts)

Why should vanishing points be placed far apart?

6. (7 pts)

What is three-point perspective, and when would you use it?

7. (7 pts)

In a bird's-eye view, where is the third vanishing point?

8. (7 pts)

Name four ways atmospheric perspective changes distant objects.

9. (7 pts)

What is the eye-level rule for drawing people on flat ground?

10. (7 pts)

Why did Saenredam keep the columns vertical in his church paintings?

11. 15 pts

Written answer: Explain how Bierstadt shows great depth in *Among the Sierra Nevada, California*. Use at least three ideas from atmospheric or linear perspective.

12. 15 pts

Written answer: Describe how Caillebotte used perspective in *Paris Street; Rainy Day*. Mention eye level, vanishing points and the lamp post.

ANSWER KEY

1. A horizontal line at the viewer's eye level.
2. When an object is seen corner-first, so two sets of edges recede from the viewer.
3. They stay perfectly vertical.
4. Its bottom.
5. Close vanishing points stretch and distort the objects.
6. Vertical lines also converge toward a third vanishing point above or below; used when looking steeply up (worm's-eye) or down (bird's-eye).
7. Far below the horizon (below the picture).
8. Lighter darks, less contrast, less detail, softer edges, cooler and grayer (bluer) color.
9. The heads of standing people about your height line up on the horizon line at any distance.
10. Converging verticals can make a building seem to tip; vertical columns keep the space calm and dignified.
11. Model: Bierstadt divides the valley into planes. The foreground trees and rocks are darkest, sharpest and most detailed, while the far peaks are pale, bluish and soft-edged, close in value to the sky. Things overlap and get smaller and higher on the canvas as they recede; the tiny animals by the lake show the huge scale of the cliffs. The sunlit distant peaks glow through the haze, pulling the eye deep into the scene.
12. Model: The eye level is at the height of the walking figures' heads, so near and far people all have their heads near the horizon line. The central wedge building shows two sides receding to two widely spaced vanishing points, and the streets and cobblestones recede as well, with stones growing smaller and less distinct. The tall lamp post divides the picture into two halves, separating the close figures from the open square. The rainy air softens the distant buildings.

PORTFOLIO PIECE: A BUILDING OR STREET FROM LIFE

Draw a real building, church, street corner or farm in your area from life (or from your own photo and sketches), using two-point perspective and atmospheric perspective. Choose a viewpoint that shows the building corner-first. Include at least one figure or tree placed correctly in the space, and finish with shading that shows one light direction.

LOOK FOR	WHAT IT MEANS
Linear perspective	One horizon line, two vanishing points, and all receding lines and verticals correct.
Atmospheric perspective	Distant parts are lighter, softer and less detailed than near parts.
Scale and figures	People or trees are placed with the eye-level rule and look the right size.
Composition	A planned thumbnail and a clear focal point; the drawing fills the page.
Craftsmanship	Guidelines erased, confident lines, consistent shading, signed and dated.

COMPOSITION

Composition is the arrangement of everything inside the edges of a picture: where the horizon falls, how big the main subject is, where the lights and darks go, and which way the eye travels. A good composition is often invisible; the viewer simply feels that the picture is right. A poor one feels awkward even when every object is drawn well.

In this unit you will learn four tools that artists have used to plan their pictures: the **rule of thirds**, the **golden ratio**, **leading lines**, and **notan**, the Japanese idea of designing with light and dark shapes. They are not laws, but tested habits that help you make deliberate choices instead of accidental ones.

PREREQUISITES

- Knows the principles of design, especially balance, emphasis and movement (Unit 1)
- Can make thumbnail sketches
- Can use a ruler and draw in one- and two-point perspective (Unit 6)

MASTERY CHECKLIST

- ☐ I can place a horizon and focal point using the rule of thirds.
- ☐ I can construct a golden rectangle and explain the golden ratio honestly, including where it is and is not found.
- ☐ I can use leading lines to guide the viewer's eye to a focal point and keep it in the picture.
- ☐ I can design a picture in two or three values using notan.
- ☐ I always make thumbnails before a finished piece.

LESSONS IN THIS UNIT

7.1 The Rule of Thirds

2 sessions of 50 minutes

7.2 The Golden Ratio

2 sessions of 50 minutes

7.3 Leading Lines

2 sessions of 50 minutes

7.4 Notan: Designing in Light and Dark

2 sessions of 50 minutes

UNIT 7 REVIEW

Answer each question. You may draw diagrams. Questions 11 and 12 should be written in complete sentences. 100 points total.

1. (7 pts)

What is composition?

2. (7 pts)

Describe the rule of thirds.

3. (7 pts)

Why does a horizon across the exact middle often feel weak?

4. (7 pts)

When might an artist choose a centered, symmetrical composition instead?

5. (7 pts)

What is the golden ratio, approximately?

6. (7 pts)

How is the Fibonacci sequence related to the golden ratio?

7. (7 pts)

Give one true fact and one exaggerated claim about the golden ratio.

8. (7 pts)

What is a leading line? Give two examples.

9. (7 pts)

What is an exit in a composition, and how can you fix one?

10. (7 pts)

What does notan mean, and what is negative space?

11. (15 pts)

Written answer: Explain how Hobbema guides the viewer's eye in *The Avenue at Middelharnis*.

12. **15 pts**

Written answer: Describe how you would plan a landscape painting using thumbnails, the rule of thirds and a notan value plan. List your steps.

ANSWER KEY

1. The arrangement of shapes, values, colors and subjects within the edges of a picture.
2. Divide the picture into thirds horizontally and vertically and place important lines and focal points on those lines or where they cross.
3. It splits the picture into two equal halves that compete; an off-center horizon makes one area dominant and creates interest.
4. For formal, still, dignified subjects such as icons, altarpieces, church façades or formal portraits.
5. About 1 to 1.618.
6. Each number divided by the one before gets closer and closer to 1.618.
7. True: spiral counts in sunflowers and pinecones are often Fibonacci numbers, and some artists used the ratio on purpose. Exaggerated: that every famous painting or building was secretly built on it.
8. A line that carries the eye toward something; for example a road, river, fence, row of trees, a person's gaze or pointing hand.
9. A strong line running straight out of the picture that takes the eye with it; fix it by bending the line, adding a tree or object at the edge, or turning a figure inward.
10. Notan means dark-light, the balance of light and dark shapes. Negative space is the space around and between the subjects.
11. Model: The straight road narrows to a vanishing point at the village, with the church tower just to its left, so the road edges and ruts act as strong leading lines into the heart of the picture. The tall rows of trees also converge toward that point and frame it like a corridor. The man and dog on the road and the low horizon reinforce the movement into depth, while the fields and trees at the sides keep the eye from leaving the picture.
12. Model: Choose a subject and make several thumbnails in the shape of the final paper, trying the horizon on the upper or lower third and the focal point near a power point. Draw eye-path arrows and fix any exits. Choose the best one and make a two-value notan, then a three-value plan, making sure the big light and dark shapes are clear and varied. Then draw the design large with light thirds lines and paint, keeping the strongest contrast at the focal point.

PORTFOLIO PIECE: A PLANNED LANDSCAPE

Create a finished landscape painting or drawing (9×12 in or larger) that shows your planning. Attach to the back at least three thumbnails and one notan value plan. The finished piece should use the rule of thirds or golden ratio for placement, leading lines that carry the eye to a clear focal point, and a strong pattern of light and dark shapes.

LOOK FOR	WHAT IT MEANS
Planning	Three or more thumbnails and a notan value plan are attached and clearly guided the final piece.
Placement	Horizon and focal point are placed deliberately using thirds or golden proportions.
Eye path	Leading lines guide the eye to the focal point, with no strong exits.
Value pattern	The picture reads clearly as big light and dark shapes from across the room.
Craftsmanship	Careful finish, clean edges, signed and dated.

7.1 THE RULE OF THIRDS

OBJECTIVES

- Divide a picture into thirds and place the horizon and focal point on the lines or their crossing points.
- Explain why off-center placement usually feels more natural than dead-center placement.
- Plan and paint a seascape or landscape using the rule of thirds.

Warm-up. Draw four small rectangles. In each, draw a simple horizon and one sailboat. Put the horizon in the middle in the first two and one-third up or down in the others; put the boat in the center in two and off-center in two. Circle the one you like best.

WATCH

The Rule of Thirds in Art

Drawing & Painting - The Virtual Instructor · 12:41

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

WHEN TO WATCH

After the core ideas. Pause on each master painting he shows and find the thirds lines yourself.

BACKUP VIDEO

The Rule of Thirds in Landcape Painting by Will Kemp

willkempartschool · 2:36

<https://www.youtube.com/watch?v=CMQ7InmM7o>

Optional, a short reminder just before you start the studio project.

KEY TERMS

composition

The arrangement of shapes, values, colors and subjects within the edges of a picture.

rule of thirds

Dividing a picture into thirds horizontally and vertically, and placing important lines and focal points on those lines or where they cross.

power points

The four places where the thirds lines cross; strong spots for a focal point.

thumbnail

A small, quick sketch used to plan a composition.

CORE IDEAS

Draw two lines across a rectangle and two lines down it, evenly spaced, like a tic-tac-toe board. The **rule of thirds** suggests placing the most important lines and objects along these lines and especially at the four places where they cross, sometimes called **power points**. A horizon on the lower third line gives a big sky; on the upper third line, a big landscape. A tree, boat or person on a vertical third line, or at a crossing point, feels placed with purpose.

Why does this work? A subject in the dead center tends to feel fixed and static, and a horizon across the exact middle cuts the picture into two equal halves that compete for attention. Placing things off-center creates **asymmetrical balance**: a large area of quiet space is balanced by a smaller, stronger subject. It also leaves room for movement, so a boat placed on the left third with open water ahead of it seems to sail into the picture.

The rule of thirds is a **guide, not a law**. Symmetrical, centered compositions are right for some subjects, such as an icon of Christ, a cathedral façade, or a formal portrait, where stillness and dignity are the goal. Use the rule when you want a natural, lively balance; break it on purpose when you want formality.

Always plan with **thumbnails**. Draw several small rectangles in the same proportions as your final paper, and try different arrangements quickly, with only big shapes and two or three values. It takes a few minutes and saves hours of work on a picture that was poorly planned from the start.

Winslow Homer, an American painter who loved the sea, placed his boats and horizons with great care. Notice how much of his picture is sky and how the boat leans into open water.

PICTURE STUDY



Breezing Up (A Fair Wind), Winslow Homer, 1873–1876 · Oil on canvas · National Gallery of Art, Washington, D.C.

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

Winslow Homer painted three boys and a fisherman sailing home on a brisk, sunny day off the coast of New England. It became one of the most loved American paintings of its time. Its composition is a lesson in placing a subject in a rectangle.

Look closely

- Imagine the thirds lines over the painting. Where is the horizon line?
- Where is the boat? Is it in the center, or placed to one side?
- Which way is the boat sailing? How much open space is in front of it?
- Find the small schooner in the distance. Where is it placed, and what does it do for the balance?

Talk about it

1. How would the painting feel if the boat were exactly in the center?
2. The sail and mast lean strongly. How does that diagonal add energy?
3. Why do you think Homer gave so much of the canvas to the sky?

STUDIO PROJECT

A Sea or Field Painting on the Thirds

You will plan a simple landscape or seascape with thumbnails, then paint it with the horizon on a thirds line and the focal point near a power point.

You will need

- Sketchbook
- Mixed-media or canvas paper, 9×12 in
- Acrylic or watercolor paints
- Brushes, palette, water, paper towels
- Ruler and pencil

Steps

1. In your sketchbook, draw four small rectangles in the proportion of your paper (3×4 in for 9×12). Draw thirds lines lightly in each.
2. Choose a subject: a boat on the sea, a barn in a field, a lone tree on a hill, a lighthouse on a shore.
3. Make four different thumbnails: horizon high or low, subject on the left or right, near or far. Use only three values.
4. Choose the best thumbnail. Explain in one sentence why you chose it.
5. On your painting paper, draw very light thirds lines. Transfer the horizon and subject from the thumbnail.
6. Paint the sky first (using what you learned in Lesson 3.4 about atmosphere), then the land or sea.
7. Paint the subject with the strongest contrast and color at the power point.
8. Add a small secondary element (a distant boat, a bird, a fence) on another thirds line to balance the main subject.
9. When dry, erase any visible pencil lines and sign your painting.

Tips

- Leave space in front of a moving subject so it has somewhere to go.
- Keep the horizon perfectly level unless you mean it to tilt.

Check your work

- ☐ I made at least four thumbnails first.
- ☐ The horizon is on or near a thirds line, not the center.
- ☐ My focal point is near a power point and has the strongest contrast.
- ☐ The picture feels balanced, with space for the eye to rest.

SKETCHBOOK PRACTICE

1. Find five pictures in books or magazines. Draw thirds lines over a quick sketch of each. Which use the rule?
2. Draw the same vase of flowers twice: once centered, once on a thirds line.
3. Look through a window and frame a view with your hands. Sketch it with the horizon on a third.

From history. The phrase “rule of thirds” was first written down by the English painter John Thomas Smith in 1797, in a book about painting rural scenes. He suggested that a picture is more pleasing when its main lines divide it in thirds rather than halves. Painters had used similar ideas long before.

COMMON MISTAKES

- Placing the horizon exactly in the middle.
- Placing the subject at the very edge, where it seems to fall out of the picture.
- Skipping thumbnails and discovering composition problems halfway through.

Make it a game • Power Point Placement. Draw a tic-tac-toe grid on paper. Your parent names a scene, such as a lone boat at sea or a barn in a field. In ten seconds, place a string for the horizon and a button for the focal point on the thirds lines. Explain why off-center feels natural.

7.2 THE GOLDEN RATIO

OBJECTIVES

- Explain the golden ratio (about 1 to 1.618) and its connection to the Fibonacci numbers.
- Construct a golden rectangle and spiral with a ruler and compass.
- Tell the difference between real examples and exaggerated claims, and use the ratio as a design guide.

Warm-up. Write the Fibonacci numbers: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55 (each is the sum of the two before it). Divide 55 by 34 and 34 by 21 on a calculator. What number do you keep getting close to?

WATCH

The Rule of Thirds vs the Golden Ratio: Which to Use?

Ian Roberts · 8:20

<https://www.youtube.com/watch?v=2NBZQtBMOY0>

WHEN TO WATCH

After the core ideas, before the picture study. Listen for his honest view of what the golden ratio can and cannot do for a picture.

BACKUP VIDEO

Golden Ratio Composition Secret!

Andrew Tischler · 18:42

<https://www.youtube.com/watch?v=wntIMD9wbR0>

Optional, a longer explanation with a ruler-and-compass construction of the golden rectangle and spiral. He ends with Leonardo's *Annunciation*, our picture study.

KEY TERMS

golden ratio

A proportion of about 1 to 1.618, found when a line is divided so that the whole is to the long part as the long part is to the short part. Written with the Greek letter ϕ (phi).

Fibonacci sequence

The numbers 1, 1, 2, 3, 5, 8, 13, 21... in which each number is the sum of the two before; neighboring numbers approach the golden ratio.

golden rectangle

A rectangle whose long side is about 1.618 times its short side.

golden spiral

A spiral drawn through a series of squares cut from a golden rectangle, growing by the golden ratio each quarter turn.

CORE IDEAS

Divide a line into two parts so that the *whole line* compares to the *long part* exactly as the *long part* compares to the *short part*. There is only one place to cut it, at about 61.8 percent of the way along. That proportion, about **1 to 1.618**, is the **golden ratio**.

Ancient Greek mathematicians such as Euclid described it, and in the Renaissance the mathematician Luca Pacioli wrote a book about it called *The Divine Proportion*, illustrated by his friend Leonardo da Vinci.

The ratio is tied to the **Fibonacci sequence**: 1, 1, 2, 3, 5, 8, 13, 21, 34... Divide any number by the one before it, and the answers get closer and closer to 1.618. The same numbers show up in many plants: the spirals of seeds in a sunflower head or the scales of a pinecone often come in Fibonacci counts, such as 8 and 13, or 34 and 55, because that arrangement packs seeds most efficiently.

You will also hear many exaggerated claims: that every famous painting, building and face is built on the golden ratio. Be careful. Some artists in the 1800s and 1900s did use it on purpose, but for many older works there is no evidence the artist intended it, and with enough lines you can “find” almost any ratio in any picture. A classical student loves truth, so we say plainly: the golden ratio is a real and lovely proportion, it appears in some living things, and it is a useful design guide, but it is not a secret code hidden in all great art.

As a design tool, the golden ratio works much like the rule of thirds. A golden division falls at 0.618 and 0.382 of the width, a little closer to the center than thirds (0.667 and 0.333). A golden rectangle is a pleasing shape for a picture or a page. A golden spiral can guide the eye inward to a focal point. Many artists find these proportions feel balanced without being rigid.

To **construct** a golden rectangle: draw a square. Find the midpoint of its bottom side. Set your compass from that midpoint to a top corner on the opposite side, and swing an arc down to the extended bottom line. That point marks the long side of a golden

rectangle. If you cut a square off a golden rectangle, the piece left over is another golden rectangle, which is how the spiral is made.

PICTURE STUDY



Annunciation, Leonardo da Vinci, about 1472–1476 · Oil and tempera on panel · Uffizi Gallery, Florence
Image: [Wikimedia Commons](#), public domain

This is one of Leonardo's earliest paintings, made when he was about twenty, while he was still working in the workshop of his master Verrocchio. It shows the angel Gabriel announcing to Mary that she will bear the Son of God (Luke 1). The wide, carefully divided panel is a good picture for testing proportions.

Look closely

- Measure the panel: about how many times wider is it than tall?
- Find the line where the garden wall ends and the open landscape begins. Where does it fall across the width?
- Find the distant mountain in the center. What frames it?
- Where are the angel and Mary placed compared with the center?

Talk about it

1. With a ruler on a printout, measure where the main divisions fall. Are they closer to halves, thirds or golden sections? (Be honest about what you find.)
2. Why do you think Leonardo left the center of the painting open to the distant landscape?
3. How do the dark trees help balance the two figures?

STUDIO PROJECT

A Golden Rectangle Nature Study

You will construct a golden rectangle and spiral with ruler and compass, then use the construction to compose a drawing of a shell, pinecone, flower or fern.

You will need

- Drawing paper, 11×14 in
- Ruler, compass and pencil (2H and 2B)
- Fine black pen and colored pencils or watercolor
- A natural object: a snail shell, pinecone, sunflower head, fern frond or rose
- Calculator (optional)

Steps

1. With the 2H pencil, draw a 5-inch square near the left of your paper.
2. Mark the midpoint of the bottom side. Set the compass from the midpoint to the top-right corner, and swing an arc down to the bottom line extended to the right. Draw the long rectangle to that point. You now have a golden rectangle about 5×8.1 inches.
3. Check: divide the long side by the short side. Is it close to 1.618?
4. Inside the leftover rectangle on the right, mark off a square, and keep dividing each leftover piece into a square and a smaller rectangle, going around in a spiral, five or six times.
5. With the compass, draw a quarter circle in each square, connecting them into a spiral.
6. Count the spirals on your pinecone or sunflower if you can, in both directions. Write the numbers. Are they Fibonacci numbers?
7. Now lightly draw your natural object in the rectangle so its most important part (the center of the shell, the heart of the flower) sits near the tight end of the spiral.
8. Finish the object with pen and color or shading. Leave the construction lines faint but visible, like an architect's plan.

Tips

- Keep the compass point steady by pressing it into a folded piece of cardboard under the paper.
- If your counts are not Fibonacci numbers, that is a real result too. Write it down.

Check your work

- ☐ My rectangle is close to 1 : 1.618.
- ☐ My spiral is constructed with at least five squares.
- ☐ The focal point of my drawing sits near the center of the spiral.
- ☐ I can explain the golden ratio and one exaggerated claim about it.

SKETCHBOOK PRACTICE

1. Measure ten rectangles in your house (books, cards, windows). Which come closest to 1.618?
2. Draw a sunflower head or pinecone from life and mark the spirals in two colors.
3. Draw a simple landscape on a golden rectangle, with the horizon at 0.618 of the height.

From history. Leonardo drew the geometric illustrations, solids made of many faces, for Luca Pacioli's book *De divina proportione*, printed in 1509. Pacioli called the ratio "divine" because, like God, it is one and cannot be expressed exactly with ordinary fractions.

COMMON MISTAKES

- Believing every famous artwork was secretly built on the golden ratio.
- Forcing a subject onto spiral lines so the drawing looks stiff.
- Measuring sloppily. Construction drawing needs a sharp pencil and careful compass work.

Make it a game • Fibonacci Race. Start with 1, 1 and add the last two numbers to make the next. Write as many terms as you can in sixty seconds. Divide a big number by the one before it and see whether it is near 1.6. Then hunt the house for a spiral, like a shell. Beat your count.

7.3 LEADING LINES

OBJECTIVES

- Identify actual and implied leading lines in a picture.
- Use leading lines to guide the eye to a focal point and keep it inside the picture.
- Design a landscape in which a road, river or row of trees leads the eye.

Warm-up. Look at a painting from this course. With your finger, trace the path your eye takes for ten seconds. Then draw that path as a single line on a rectangle in your sketchbook. Where did it start and where did it end?

WATCH

The #1 Composition Rule You Cannot Break

Ian Roberts • 8:22

<https://www.youtube.com/watch?v=3-Cc2SxDofk>

WHEN TO WATCH

After the core ideas. He explains why the eye must be led into a picture and kept there.

KEY TERMS

leading line

A line in a picture (a road, river, fence, edge or row of objects) that carries the viewer's eye toward something.

implied line

A line we sense but that is not drawn, such as the direction a person is looking or pointing, or a row of separate objects.

eye path

The route the viewer's eye travels through a picture.

exit

A strong line that runs straight out of the edge of the picture, carrying the eye away.

CORE IDEAS

Our eyes naturally follow lines, the same way we follow a path through a field. Artists use this to steer the viewer. A road narrowing into the distance, a river winding back, a fence, a row of trees, the edge of a shadow, even the direction a

person is looking, are all **leading lines**. The strongest leading lines point toward the focal point.

Leading lines can be **actual** (a road you can see) or **implied** (a gaze, a pointing hand, a row of birds). In religious paintings, figures often look or gesture toward the most important person, making implied lines that lead us to him. In perspective drawings, the orthogonals themselves become leading lines: they all point to the vanishing point, which makes it a natural place for a focal point.

The other half of the skill is **keeping the eye in the picture**. A line that runs straight out of a corner is an **exit**: the eye slides out and the viewer stops looking. Good composers turn lines back inward with a bend in a road, a tree at the edge of the picture, or a figure facing into the scene. The best eye paths are S-curves and zigzags that wander through the whole picture and return to the focal point.

Diagonal leading lines feel active; horizontal ones feel calm; vertical ones feel tall and still. A road that leads straight back to a point creates deep space and a strong sense of arrival. A winding river feels gentle and unhurried.

To design with leading lines, make a thumbnail, then draw arrows on it showing the eye path. If an arrow leads off the page, add something to stop it.

PICTURE STUDY



The Avenue at Middelharnis, Meindert Hobbema, 1689 · Oil on canvas · National Gallery, London

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

Hobbema painted a real avenue of trees leading to the Dutch village of Middelharnis. It is one of the most famous examples of leading lines and one-point perspective in landscape painting.

Look closely

- Follow the road with your eye. Where does it lead?
- Find the vanishing point, where the road disappears. What buildings are near it?
- Look at the tall trees. How do they act as leading lines? Where do their tops point?
- Find the man and dog on the road, and the man working in the field on the right. How do they fit the eye path?

Talk about it

1. How does the straight road make you feel? Calm, hurried, curious?
2. The church tower stands a little to the left of where the road ends. Why might Hobbema have placed it there instead of exactly at the end of the road?
3. What stops your eye from leaving the picture at the sides?

STUDIO PROJECT

A Path That Leads Somewhere

You will design and draw a landscape in which a road, path, river or row of trees leads the viewer's eye to a focal point, such as a church, a house, a bridge or a lone figure, without letting the eye escape.

You will need

- Sketchbook for thumbnails
- Drawing paper, 11×14 in
- Graphite pencils or charcoal
- Colored pencils, oil pastels or watercolor (optional)
- Ruler

Steps

1. Choose a destination for your focal point: a church, a farmhouse, a bridge, a gate, a figure.
2. Make three thumbnails with different leading lines: a straight road to a vanishing point, an S-curved river, and a zigzag path or fence.
3. On each thumbnail, draw arrows showing the eye path. Mark any exits with an X.
4. Choose the strongest thumbnail and fix any exits (bend a line, add a tree at the edge, turn a figure inward).
5. Draw the design large, placing the focal point near a thirds point or vanishing point.
6. Make the leading lines strong but not too heavy: use the edges of the road, the shadows of trees, or the repeated posts of a fence.
7. Add implied lines: a figure walking toward the destination, birds flying toward it.
8. Finish with value (and color if you like), saving the strongest contrast for the focal point.
9. On the back, draw a tiny diagram of your eye path.

Tips

- Roads and rivers should get narrower and their edges softer as they recede.
- A single tree at the edge of a picture can act like a door frame, keeping the eye inside.

Check your work

- ☐ My leading lines clearly point to the focal point.
- ☐ There are no strong lines running straight out of the picture.
- ☐ I used at least one implied line.
- ☐ My thumbnails show my planning with arrows.

SKETCHBOOK PRACTICE

1. Draw a staircase, hallway or row of fence posts from life and notice how it leads the eye.
2. Make a thumbnail of a Bible story scene where all the figures look toward one person.
3. Find a road or path near your home and sketch it, emphasizing where it leads.

From history. Hobbema painted in the late Dutch Golden Age, when many landscape painters worked in Holland. He painted less after taking a job as a wine gauger in Amsterdam, which is part of why this mature work is so treasured. It entered the National Gallery in London in 1871.

COMMON MISTAKES

- A road or river that runs straight out of a corner and takes the viewer with it.
- Leading lines that point to nothing in particular.
- Too many competing lines pointing in different directions.

Make it a game • Follow the Line. On paper, draw several lines, real or implied by a pointing finger or a glance, that lead to a secret small spot. Your parent traces with a finger and finds the focal point. Make sure no line carries the eye out of the picture. Switch roles. Score a point for each spot found.

7.4 NOTAN: DESIGNING IN LIGHT AND DARK

OBJECTIVES

- Explain notan as the balance of light and dark shapes in a design.
- Make a cut-paper notan using positive and negative space.
- Plan a picture as a simple two- or three-value design before adding detail.

Warm-up. Look at any picture in this course and squint until it becomes only dark shapes and light shapes. Draw it in a 2-inch box using only a black marker or soft pencil and the white of the paper. No grays allowed.

WATCH

Notan Beginner Demonstration

Bethany Thiele, Art Teacher · 3:05

https://www.youtube.com/watch?v=vt_HZv0tNZk

WHEN TO WATCH

Before the cut-paper part of the studio project. Watch how every shape cut from the black square is flipped outward to the white side.

BACKUP VIDEO

Nōtan (濃淡): Making your first Nōtan design, with Rob the Art Teacher

Rob the Art Teacher · 5:20

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

Optional, a second cut-paper notan demonstration with more explanation.

KEY TERMS

notan

A Japanese word meaning “dark-light”: the arrangement and balance of light and dark shapes in a design.

positive space

The shapes of the main subjects.

negative space

The space around and between the subjects, which also forms shapes.

value pattern

The overall design of large light, middle and dark shapes in a picture, seen when details are ignored.

CORE IDEAS

Squint at any strong picture and its details disappear, leaving a few big shapes of light and dark. That underlying pattern is what the eye reads first, from across a room, before it notices anything else. The Japanese word **notan** (said NO-tahn) names this: the harmony of dark and light. The American teacher Arthur Wesley Dow brought the idea into Western art teaching around 1900, after studying Japanese prints.

In notan, **negative space** matters as much as **positive space**. The white shape of the sky between two trees is as much a part of the design as the trees. In a well-designed notan, both the dark and light shapes are interesting, varied in size, and balanced, not one big blob of black and a little white, nor an even checkerboard.

A classic exercise is the **expansion of the square**: cut shapes from the edges of a black square and flip them outward onto white paper, like opening a hinge. Every shape removed from the dark becomes a light shape inside it and a dark shape outside it. The result shows how dark and light can balance each other perfectly.

Painters use notan to plan. Before drawing details, they make a small sketch in two values (light and dark) or three (light, middle and dark), deciding where the big shapes go. If the notan sketch is strong, the finished picture will read clearly. If the notan is confusing, no amount of detail will fix it.

Hiroshige, whose print you will study, was a master of notan: dark bridges, pale rain, black figures against light water. Van Gogh admired this print so much that he copied it in oil paint.

PICTURE STUDY



Sudden Shower over Shin-Ōhashi Bridge and Atake, Utagawa Hiroshige, 1857 · Woodblock print; ink and color on paper · Impressions in many museums, including the Brooklyn Museum, New York

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

This print comes from Hiroshige's series *One Hundred Famous Views of Edo* (the old name of Tokyo). It shows people caught in a sudden summer rainstorm on a bridge. Its bold design of dark and light shapes made it famous in Japan and in Europe.

Look closely

- Squint. What are the biggest dark shapes? What are the biggest light shapes?
- Look at the bridge. How does its diagonal divide the picture?
- Look at the people on the bridge. Are they light shapes or dark shapes against the bridge?
- Look at the dark band of cloud at the top. How does it balance the dark shore below?

Talk about it

1. How did Hiroshige show rain with only lines?
2. Why is the bridge placed on a diagonal instead of straight across?
3. If you made a notan of this print in only black and white, what would it look like?

STUDIO PROJECT

From Cut-Paper Notan to Value Plan

First you will make an “expansion of the square” notan in cut paper. Then you will use the same idea to design a landscape in three values, a plan you could use for a painting.

You will need

- Black construction paper or cardstock (a 5-inch square)
- White paper, 9×12 in
- Scissors (or a craft knife with an adult, on a cutting mat)
- Glue stick
- Pencil
- Black marker and a gray marker or 4B pencil
- Sketchbook

Steps

1. Center the black square on the white paper and trace it lightly. Do not glue it yet.
2. On the black square, draw a simple shape that touches one edge (a leaf, a wave, a stair-step). Cut it out carefully in one piece, keeping both pieces.
3. Glue the square on the white paper. Flip the cut piece outward like opening a door, so it lines up with the edge it came from, and glue it there as a mirror image.
4. Repeat on the other three sides, using different shapes. Make sure no pieces are lost; every cut should create a matching light and dark shape.
5. Look at the result. Is the balance of black and white interesting? Write one sentence about it.
6. Now, in your sketchbook, design a landscape (trees, a hill, a house, a moon or a bridge) as a two-value notan with a black marker: every area is either black or white.
7. Redraw it as a three-value design, adding gray for middle values. Make the largest shapes different sizes.

8. Choose your best value design and draw it at 6×8 inches, cleanly, with crisp shapes.
9. Label it “Value plan” and keep it; you may use it for a painting later.

Tips

- Cut slowly, turning the paper rather than the scissors.
- Avoid tiny fussy shapes; notan is about big, clear shapes.

Check your work

- ☐ My cut-paper notan has flipped shapes on all four sides with no pieces lost.
- ☐ Dark and light shapes are both interesting and balanced.
- ☐ My landscape value plan reads clearly from across the room.
- ☐ My big shapes are varied in size.

SKETCHBOOK PRACTICE

1. Make two-value notan sketches of three master paintings from this course.
2. Draw a tree against the sky as a notan, paying attention to the white shapes between the branches.
3. Design a notan of an initial letter of your name with a vine or leaf around it.

From history. Van Gogh owned hundreds of Japanese prints and in 1887 painted his own copy of this one, called *Bridge in the Rain*, adding a border of Japanese characters. Japanese prints taught many European painters to use flat, bold shapes and unusual viewpoints.

COMMON MISTAKES

- Losing a cut piece, which breaks the mirror balance.
- Making all the shapes the same size, which is dull.
- Adding detail before the big light and dark shapes are working.

Make it a game • Cut and Flip Notan. Fold black paper in half. In two minutes, safely cut a shape from the fold with scissors, then flip the cutout to the other side of white paper. Your parent names the positive space and the negative space. Check that light and dark feel balanced. Keep scissors in hand only while seated.

Scripture. “And whatsoever ye do, do it heartily, as to the Lord, and not unto men;” (Colossians 3:23, KJV)

Planning a picture with thumbnails and value plans is unseen work that no one may notice. Do it heartily anyway; good craftsmanship begins with careful preparation.

COMPOSITION

Composition is the arrangement of everything inside the edges of a picture: where the horizon falls, how big the main subject is, where the lights and darks go, and which way the eye travels. A good composition is often invisible; the viewer simply feels that the picture is right. A poor one feels awkward even when every object is drawn well.

In this unit you will learn four tools that artists have used to plan their pictures: the **rule of thirds**, the **golden ratio**, **leading lines**, and **notan**, the Japanese idea of designing with light and dark shapes. They are not laws, but tested habits that help you make deliberate choices instead of accidental ones.

PREREQUISITES

- Knows the principles of design, especially balance, emphasis and movement (Unit 1)
- Can make thumbnail sketches
- Can use a ruler and draw in one- and two-point perspective (Unit 6)

MASTERY CHECKLIST

- ☐ I can place a horizon and focal point using the rule of thirds.
- ☐ I can construct a golden rectangle and explain the golden ratio honestly, including where it is and is not found.
- ☐ I can use leading lines to guide the viewer's eye to a focal point and keep it in the picture.
- ☐ I can design a picture in two or three values using notan.
- ☐ I always make thumbnails before a finished piece.

LESSONS IN THIS UNIT

7.1 The Rule of Thirds

2 sessions of 50 minutes

7.2 The Golden Ratio

2 sessions of 50 minutes

7.3 Leading Lines

2 sessions of 50 minutes

7.4 Notan: Designing in Light and Dark

2 sessions of 50 minutes

UNIT 7 REVIEW

Answer each question. You may draw diagrams. Questions 11 and 12 should be written in complete sentences. 100 points total.

1. (7 pts)

What is composition?

2. (7 pts)

Describe the rule of thirds.

3. (7 pts)

Why does a horizon across the exact middle often feel weak?

4. (7 pts)

When might an artist choose a centered, symmetrical composition instead?

5. (7 pts)

What is the golden ratio, approximately?

6. (7 pts)

How is the Fibonacci sequence related to the golden ratio?

7. (7 pts)

Give one true fact and one exaggerated claim about the golden ratio.

8. (7 pts)

What is a leading line? Give two examples.

9. (7 pts)

What is an exit in a composition, and how can you fix one?

10. (7 pts)

What does notan mean, and what is negative space?

11. (15 pts)

Written answer: Explain how Hobbema guides the viewer's eye in *The Avenue at Middelharnis*.

12. **15 pts**

Written answer: Describe how you would plan a landscape painting using thumbnails, the rule of thirds and a notan value plan. List your steps.

ANSWER KEY

1. The arrangement of shapes, values, colors and subjects within the edges of a picture.
2. Divide the picture into thirds horizontally and vertically and place important lines and focal points on those lines or where they cross.
3. It splits the picture into two equal halves that compete; an off-center horizon makes one area dominant and creates interest.
4. For formal, still, dignified subjects such as icons, altarpieces, church façades or formal portraits.
5. About 1 to 1.618.
6. Each number divided by the one before gets closer and closer to 1.618.
7. True: spiral counts in sunflowers and pinecones are often Fibonacci numbers, and some artists used the ratio on purpose. Exaggerated: that every famous painting or building was secretly built on it.
8. A line that carries the eye toward something; for example a road, river, fence, row of trees, a person's gaze or pointing hand.
9. A strong line running straight out of the picture that takes the eye with it; fix it by bending the line, adding a tree or object at the edge, or turning a figure inward.
10. Notan means dark-light, the balance of light and dark shapes. Negative space is the space around and between the subjects.
11. Model: The straight road narrows to a vanishing point at the village, with the church tower just to its left, so the road edges and ruts act as strong leading lines into the heart of the picture. The tall rows of trees also converge toward that point and frame it like a corridor. The man and dog on the road and the low horizon reinforce the movement into depth, while the fields and trees at the sides keep the eye from leaving the picture.
12. Model: Choose a subject and make several thumbnails in the shape of the final paper, trying the horizon on the upper or lower third and the focal point near a power point. Draw eye-path arrows and fix any exits. Choose the best one and make a two-value notan, then a three-value plan, making sure the big light and dark shapes are clear and varied. Then draw the design large with light thirds lines and paint, keeping the strongest contrast at the focal point.

PORTFOLIO PIECE: A PLANNED LANDSCAPE

Create a finished landscape painting or drawing (9×12 in or larger) that shows your planning. Attach to the back at least three thumbnails and one notan value plan. The finished piece should use the rule of thirds or golden ratio for placement, leading lines that carry the eye to a clear focal point, and a strong pattern of light and dark shapes.

LOOK FOR	WHAT IT MEANS
Planning	Three or more thumbnails and a notan value plan are attached and clearly guided the final piece.
Placement	Horizon and focal point are placed deliberately using thirds or golden proportions.
Eye path	Leading lines guide the eye to the focal point, with no strong exits.
Value pattern	The picture reads clearly as big light and dark shapes from across the room.
Craftsmanship	Careful finish, clean edges, signed and dated.

UNIT 8

ART FROM ANCIENT TO MEDIEVAL

This unit is a journey through about three thousand years of art, from the painted tombs of Egypt to the illuminated Gospels of Ireland. These artists did not use the perspective or the soft modeling you practiced this year, and not because they could not see. They chose different goals: permanence and order in Egypt, heavenly light and holiness in Byzantium, soaring height and color in the Gothic cathedrals, and intricate praise in the pages of the Book of Kells.

In each lesson you will look closely at one great work, learn how and why it was made (often with surprising material science), and make something with your own hands using the same methods: drawing on an Egyptian grid, setting a paper mosaic, designing a stained-glass window, and illuminating a letter. You will see that much of the greatest art of these centuries was made for the worship of God, by makers who often left no names.

PREREQUISITES

- Knows the elements and principles of design (Unit 1)
- Understands linear perspective (Unit 6) and notan (Unit 7), to compare with flat, patterned styles
- Can use a ruler, compass and fine pen

MASTERY CHECKLIST

- ☐ I can describe the conventions of Egyptian painting, such as composite view and the proportion grid.
- ☐ I can explain how Byzantine mosaics and icons were made and why they look as they do.
- ☐ I can tell Romanesque from Gothic architecture and explain how stained glass is made.
- ☐ I can describe how the Book of Kells was made and draw a simple interlace pattern.
- ☐ I can place these works in order on a timeline.

LESSONS IN THIS UNIT

8.1 Egyptian Art

2 sessions of 50 minutes

8.2 Byzantine Mosaics and Icons

2 sessions of 50 minutes

8.3 Romanesque and Gothic: Churches of Stone and Light

2 sessions of 50 minutes

8.4 The Book of Kells and Illumination

2 sessions of 50 minutes

UNIT 8 REVIEW

Answer each question. Questions 11 and 12 should be written in complete sentences.
100 points total.

1. (7 pts)

What is composite view in Egyptian art? Give an example.

2. (7 pts)

What was the purpose of the grid in Egyptian figure drawing?

3. (7 pts)

How was Egyptian blue made?

4. (7 pts)

What are tesserae, and how were gold tesserae made?

5. (7 pts)

Why do Byzantine mosaics sparkle?

6. (7 pts)

What is encaustic, and what is egg tempera?

7. (7 pts)

Name three differences between Romanesque and Gothic churches.

8. (7 pts)

What does a flying buttress do?

9. (7 pts)

How was stained glass colored, and what holds the pieces together?

10. (7 pts)

What is vellum, and what was iron gall ink made from?

11. (15 pts)

Written answer: Compare the Sinai *Christ Pantocrator* with Christ in the Book of Kells. How are they alike and different in purpose, materials and style?

12. (15 pts)

Written answer: Explain how Gothic builders turned church walls into walls of light. Include at least three architectural features and how stained glass was made.

ANSWER KEY

1. Showing each part from its clearest angle in one image, such as a profile head with a front-view eye and front-view shoulders, or a pool seen from above with trees seen from the side.
2. It was a canon of proportion that kept figures consistent, so many artists could draw the same proportions for centuries.
3. By heating sand, a copper mineral and lime together until they fused into blue crystals, then grinding them into pigment.
4. The small pieces of a mosaic. Gold tesserae were made by fusing gold leaf between glass layers.
5. The tesserae are glass and gold set at slightly different angles, so they catch the light differently as you move.
6. Encaustic is pigment in hot melted beeswax; egg tempera is pigment mixed with egg yolk and water.
7. Round vs. pointed arches; thick walls vs. thinner walls with flying buttresses; small windows vs. large stained-glass windows; barrel vaults vs. rib vaults; heavy vs. tall and soaring.
8. It carries the outward push of the vault down to the ground outside the wall, so the walls can be thin and filled with windows.
9. Metal compounds were added to molten glass (cobalt for blue, copper for red); the pieces are held together by H-shaped lead strips called comes in an iron frame.
10. Vellum is prepared calfskin; iron gall ink was made from oak galls, iron salts and gum.
11. Model: Both show Christ facing the viewer directly, holding the Gospels, to present Him as holy and present rather than as part of a scene. Both were made for worship by unnamed makers in monasteries. The Sinai icon is painted in encaustic on wood, with soft modeling of the face and a real background; the Kells page is ink and pigments on vellum, flat and patterned, surrounded by interlace and spirals, so the figure becomes part of an ornamental design.
12. Model: Pointed arches pushed weight more downward, rib vaults gathered the ceiling's weight onto a few columns, and flying buttresses outside carried the remaining outward push to the ground. Because the walls no longer had to hold the roof, they could be opened into huge windows. These were filled with

stained glass: glass colored with metal compounds, cut to patterns, painted with dark glass paint and fired, then joined with lead comes in iron frames.

PORTFOLIO PIECE: AN ILLUMINATED PAGE IN AN ANCIENT OR MEDIEVAL STYLE

Make one finished page, 9×12 in or larger, in the style of one of this unit's traditions: an illuminated Scripture verse with a decorated initial and border, an icon-style image with a gold background, a stained-glass design, or an Egyptian-style scene on a grid. On the back, write a short museum label naming the style, the materials the original artists used, and how your piece imitates their method.

LOOK FOR	WHAT IT MEANS
Faithful to the style	The piece clearly uses the conventions of its tradition (composite view, gold ground, lead lines, or interlace).
Design	Strong, readable composition with balanced pattern and a clear focal point.
Color and line	Flat, strong colors and clean, steady lines suited to the style.
Craftsmanship and patience	Careful, unhurried work with even patterns and no smudges; signed and dated.
Museum label	The label correctly explains the original materials and methods.

8.1 EGYPTIAN ART

OBJECTIVES

- Describe the main conventions of Egyptian painting: composite view, registers, hierarchical scale and the proportion grid.
- Explain what Egyptian painters' pigments were made of, including Egyptian blue.
- Draw a scene in the Egyptian manner on a grid.

Warm-up. Stand in front of a mirror and look at your face from the side, then turn to the front. In your sketchbook, draw your head in profile but put a front-view eye in it, the way Egyptian artists did. Does it look strange or natural?

WATCH

Drawing an Egyptian Figure Using a Grid

Rachael Doran · 4:34

<https://www.youtube.com/watch?v=XtTp5S0csns>

WHEN TO WATCH

Before the studio project. Draw along as she sets up a grid and builds a figure in the Egyptian manner: head in profile, shoulders from the front, both feet on the ground line.

Note: A small teacher's channel. It was chosen because the museum overviews of Egyptian art we checked show unclothed figures; this one sticks to drawing a clothed figure on a grid.

BACKUP VIDEO

The oldest synthetic pigment, Egyptian Blue

Dirty Blue Tube · 3:46

https://www.youtube.com/watch?v=3XP_4KlNPcs

Optional, a short look at how Egyptian blue is made, with the real pigment.

KEY TERMS

composite view

Showing each part of a subject from its most recognizable angle in one image: a head in profile with a front-view eye, shoulders from the front, legs from the side.

hierarchical scale

Making the most important figure the largest, regardless of distance.

Egyptian blue

A blue pigment made by heating sand, copper and lime together; one of the first man-made pigments in history.

register

A horizontal band or strip in which figures stand, stacked one above another like lines of writing.

canon of proportion

A fixed system of measurements, often a grid of squares, used to draw the human figure the same way every time.

CORE IDEAS

Ancient Egyptian painting looks flat and patterned, and that was on purpose. Egyptian artists were not trying to show how a thing looked from one spot at one moment. They wanted to show what it *is*, completely and permanently, so they drew each part from its clearest angle. A person's head is in profile, but the eye is drawn from the front; the shoulders face us; the legs and feet walk to the side. This is called **composite view**. A garden pool might be drawn from above as a rectangle, with the trees around it drawn from the side, laid flat around its edges.

Egyptian pictures are organized in **registers**, horizontal bands like lines of text, which is fitting in a culture where pictures and hieroglyphic writing were closely related. Important people are drawn larger than servants or children (**hierarchical scale**). Figures were laid out on a **grid of squares**, a canon of proportion: in the New Kingdom, a standing figure usually measured 18 squares from the soles of the feet to the hairline. This let teams of artists draw consistent figures on huge walls for centuries.

The paintings were made on smooth plaster over stone or mud walls. Painters mixed powdered pigments with a binder of plant gum or animal glue. Their colors came from the earth and from early chemistry: red and yellow ochres (iron-rich clays), white from gypsum or chalk, black from soot (carbon), green from crushed malachite or a green frit, and the famous **Egyptian blue**, made by heating sand, a copper mineral and lime in a furnace until they fused into blue glassy crystals, which were then ground to powder. It is one of the oldest synthetic pigments in the world, and many Egyptian paintings still show their brilliant blues after more than three thousand years.

Egyptian art changed very little over nearly three thousand years, because its makers valued order, permanence and tradition more than novelty. It is a good reminder that “realistic” is only one aim an artist can have. Clarity, order and lasting design are aims too.

We look at the art of Egypt as historians, admiring its craftsmanship and design. Egypt also appears in the Bible: Joseph and Moses lived there, and the Israelites helped build its cities before God led them out.

PICTURE STUDY



Pond in a Garden, from the Tomb-chapel of Nebamun, Unknown Egyptian painters, about 1350 BC ·

Paint on dry plaster · British Museum, London

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

This wall painting comes from the tomb-chapel of Nebamun, a scribe and grain counter in the Egyptian city of Thebes. It shows a beautiful garden with a pool, the kind of peaceful, well-ordered place Egyptians loved. It is one of the most famous examples of composite view.

Look closely

- Look at the pool. Are you seeing it from the side or from above?
- Now look at the trees around it. From which angle are they drawn? Which way are they lying?
- Count the different kinds of trees, birds and fish. How did the painter make each one clear?
- Find the patterns: rows of trees, ripples in the water, repeated lotus flowers.

Talk about it

1. Why might an Egyptian painter show the pool from above and the trees from the side in one picture?
2. Is this painting realistic? Is it clear? Explain the difference.

3. How has the blue lasted so long? (Think about what Egyptian blue is made of.)

STUDIO PROJECT

A Scene on an Egyptian Grid

You will draw a scene from daily life (gardening, fishing from a boat, harvesting grain, carrying a basket of fruit) in the Egyptian manner: on a grid, in composite view, in a register, with an earth-color palette.

You will need

- Drawing paper or cardstock, 11×14 in (tan or cream if you have it)
- Ruler and pencil
- Colored pencils or tempera: red and yellow ochre (or orange and tan), black, white, turquoise or blue, green
- Fine black marker
- A printout or tracing of an Egyptian figure for reference (optional)

Steps

1. With a ruler, draw a base line for your register about 2 inches from the bottom, and another band above it for a second register if you like.
2. Lightly draw a grid of ½-inch squares over the area where your main figure will stand.
3. Draw a standing figure 18 squares tall from the feet to the hairline: the knees at about square 6, the waist at about 11, the shoulders at about 16.
4. Draw in composite view: head in profile, eye from the front, shoulders from the front, waist turning, legs and feet from the side, with both feet showing.
5. Add what the figure is doing: holding a basket, a fishing net or a sickle. Add a second, smaller figure (a child or helper) to show hierarchical scale.
6. Add a garden pool from above, or rows of plants from the side, using composite view.
7. Outline the figures with a fine black marker in clean, even lines.
8. Color with flat areas of earth colors: men traditionally in reddish brown, women in lighter yellow-tan, white linen clothing, blue and green for water and plants. No shading.

9. Erase visible grid lines outside the figures, or leave a few faint ones to show your method.

Tips

- Egyptian lines are steady and confident. Draw slowly.
- Keep colors flat and clear, like the original, without shading.

Check your work

- ☐ My main figure is drawn on an 18-square grid.
- ☐ I used composite view for the figure and for at least one object.
- ☐ My scene stands on a register line.
- ☐ I used flat earth colors with clean black outlines.

SKETCHBOOK PRACTICE

1. Draw a cat, a duck and a fish in the Egyptian manner, each from its clearest angle.
2. Draw your kitchen table from above with the chairs drawn from the side, laid flat around it.
3. Write your name in a cartouche (an oval loop) and decorate the border with lotus flowers.

From history. The paintings from Nebamun's tomb-chapel were removed around 1820 and sold to the British Museum, and the location of the tomb was later forgotten. Conservators spent ten years cleaning and repairing them before they went back on display in 2009.

COMMON MISTAKES

- Shading the figures. Egyptian painting uses flat color.
- Drawing both eyes on a profile face.
- Forgetting the grid, so the proportions wander.

Make it a game • Compose a Pose. Stand in the Egyptian way: head in profile, eye seen from the front, shoulders turned forward, legs in profile. Your parent then asks about registers, hierarchical scale and the proportion grid. Make the pharaoh larger on paper. Answer five questions to complete the tomb painting. Name what Egyptian blue was made of.

8.2 BYZANTINE MOSAICS AND ICONS

OBJECTIVES

- Explain how Byzantine mosaics were made from glass and gold tesserae and why they glitter.
- Describe how icons were painted and what their style was meant to show.
- Make a paper mosaic using the Byzantine method of tesserae and gold.

Warm-up. Draw a 3-inch circle. Fill it using only small squares, like tiles, packed closely together with thin gaps. Follow the curve of the circle with your outer row of squares. How did you handle the curve?

WATCH

Deësis mosaic, Hagia Sophia, Istanbul

[Smarthistory](#) · 5:08

<https://www.youtube.com/watch?v=2JxljqKTLs>

WHEN TO WATCH

After the core ideas. Notice how close-up views show the separate tiles.

BACKUP VIDEO

Icon painter Peter Murphy's tutorial on Egg Tempera and Icon Painting, Lovelys Gallery.

[Lovelys Gallery](#) · 8:06

<https://www.youtube.com/watch?v=geafR2FIHO4>

Watch in the second session to see how egg tempera is mixed and how an icon is painted.

KEY TERMS

mosaic

A picture made of small pieces of stone, glass or ceramic set in plaster or cement.

tessera (plural tesserae)

One small piece of a mosaic.

icon

From the Greek word for “image”: a sacred painting, usually on a wooden panel, of Christ, the Virgin Mary or a saint, made for prayer and worship.

encaustic

Painting with pigment mixed into hot, melted beeswax.

egg tempera

Paint made of pigment mixed with egg yolk and a little water; the usual medium of later icons.

CORE IDEAS

After the Roman Empire became Christian, its eastern capital, Constantinople, became the center of a new art we call **Byzantine**. Its builders covered the domes and walls of churches with **mosaics** of Christ, Mary and the saints, set against shining gold. Inside a dim church lit by candles and small windows, these walls seemed to glow with heavenly light.

Byzantine mosaics are made of **tesserae**, small cubes of colored glass and stone. Colored glass was made by adding metal compounds to molten glass (copper for reds and greens, cobalt for deep blue). Gold tesserae were made by laying a thin sheet of gold leaf on glass and fusing a thin layer of clear glass over it. The mosaicists pressed each tessera into wet plaster, often tilting it very slightly, so that each tiny face caught the light at a different angle and the surface sparkled as you moved. Rows of tesserae follow the contours of faces and robes, like lines in a drawing.

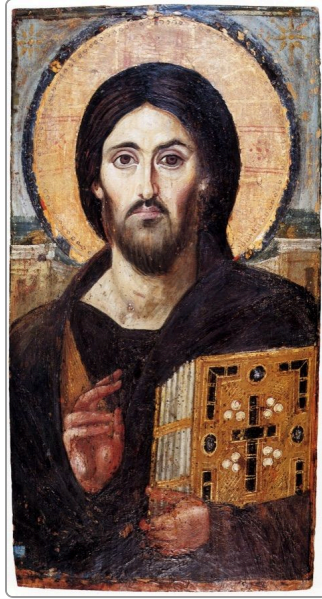
Icons are sacred images painted on wooden panels. The earliest surviving icons, like the 6th-century Christ at Sinai, were painted in **encaustic**, pigment in melted beeswax, which stays bright for centuries. Later icons were painted in **egg tempera** on a wood panel coated with smooth white gesso (chalk and animal glue), with backgrounds and halos of gold leaf. The painter works from dark to light in thin layers.

Icons look different from Renaissance paintings on purpose. Figures face us directly, eyes large and calm, often against gold instead of a landscape. The goal was not to show a moment in ordinary space but to show a holy person present before the

viewer, in the light of heaven. Icon painters often describe their work as “writing” an icon, and they prepare with prayer.

As you work, think about how the Byzantine makers turned humble materials (sand, metal, egg, wax and wood) into images of glory.

PICTURE STUDY



Christ Pantocrator, Unknown Byzantine painter, 6th century · Encaustic on wood panel · Saint Catherine's Monastery, Mount Sinai, Egypt
Image: [Wikimedia Commons](#), public domain

This is one of the oldest icons in the world, kept for about 1,500 years at Saint Catherine's Monastery at the foot of Mount Sinai. *Pantocrator* means “ruler of all.” Christ holds the Gospels and raises His right hand in blessing.

Look closely

- Look closely at the two halves of the face. Are the eyes and the sides of the mouth the same?
- Find the jeweled book. How did the painter make the jewels look raised and shiny?
- Look at the blessing hand. How are the fingers arranged?
- Notice the brushstrokes in the face. Encaustic is wax. Can you see how it was worked?

Talk about it

1. Many people see the two different sides of the face as showing that Christ is both fully God and fully man. How might one side look more like a judge and the other more gentle?
2. Why do you think icons show figures facing us directly, looking at us?

3. How is this image different from Caravaggio's *Supper at Emmaus*? How are they alike?

STUDIO PROJECT

A Paper Mosaic with Gold

You will design a simple sacred symbol or figure and set it in paper tesserae, using the Byzantine methods: an outline row that follows the shape, rows that follow the contours, and a gold background.

You will need

- Heavy paper or thin cardboard, 9×12 in
- Colored paper in several colors (construction paper or magazine pages), cut into $\frac{1}{4}$ – $\frac{1}{2}$ in squares
- Gold paper or yellow paper (gold gift wrap, foil, or yellow paper painted with metallic paint)
- Glue stick or white glue and a small brush
- Pencil, scissors, a cup or small tray for each color

Steps

1. Choose a design: a cross, a dove, a fish, a lamb, the Chi-Rho symbol, a single lily, or the face of a saint inspired by an icon. Draw it large and simple on your board.
2. Cut strips of each color about $\frac{1}{2}$ inch wide, then cut the strips into squares. Keep each color in its own cup.
3. Start with the outline: glue a row of dark tesserae along the edges of your design, following every curve, leaving thin gaps between tiles.
4. Fill the inside of the design with rows that follow its shape, like the rows on a Byzantine face or robe. Trim tiles into wedges where the curves get tight.
5. Use two or three values of each color to show light and shadow on the design.
6. Make a halo or border with a row of contrasting tiles.
7. Fill the background with gold tesserae in straight or gently curving rows, tilting none of them (paper cannot tilt), but leaving even gaps that will look like grout lines.
8. Press everything flat under a book to dry.

Tips

- The gaps between tiles are part of the beauty. Keep them small and even.
- Work outward from the design toward the edges.

Check your work

- ☐ My design is outlined with a row of tiles that follows its shape.
- ☐ The inner rows follow the contours of the design.
- ☐ My background is gold.
- ☐ The gaps are even and the tiles are firmly glued.

SKETCHBOOK PRACTICE

1. Copy the face of the Sinai Christ in pencil, studying the differences between its two sides.
2. Draw a small section of a mosaic face as a grid of tiles, following the curve of the cheek.
3. Design a border of repeating crosses or vines for an icon frame.

From history. Saint Catherine's Monastery, founded in the 500s by the Emperor Justinian, has been home to monks ever since. Because of its remote desert location, it escaped the period of icon destruction in the 700s and 800s and holds the oldest collection of icons in the world.

COMMON MISTAKES

- Filling the inside in straight rows like graph paper. Byzantine rows follow the shape.
- Gaps that are too wide or uneven.
- Too many small details. Byzantine designs are bold and simple, readable from far away.

Make it a game • Say It, Then Glue It. Tear colored paper into small tesserae. Before gluing each tessera, say one true fact about Byzantine mosaics or icons, such as glass, gold or egg tempera. Keep facts coming until the shape is filled. Your parent counts how many facts and how many tesserae. No repeats are allowed.

Scripture. “Who is the image of the invisible God, the firstborn of every creature:” (Colossians 1:15, KJV)

Byzantine Christians believed that because the Son of God became a man, He could truly be pictured. That belief lies behind every icon.

8.3 ROMANESQUE AND GOTHIC: CHURCHES OF STONE AND LIGHT

OBJECTIVES

- Compare the features of Romanesque and Gothic churches: arches, vaults, walls, windows and buttresses.
- Explain how stained glass is made and how it is held in a window.
- Design and make a stained-glass window panel.

Warm-up. Draw a round arch and a pointed arch side by side, each 3 inches wide. Which one could be made taller without getting wider? Which looks heavier? Which looks like it is reaching upward?

WATCH

Gothic architecture explained

Smarthistory · 4:31

<https://www.youtube.com/watch?v=G94jFWH8NSM>

WHEN TO WATCH

After the core ideas, before the picture study.

BACKUP VIDEO

Differences between Romanesque and Gothic Architecture || Medieval Art History

Accessible Art History · 8:02

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

Optional, for a fuller side-by-side comparison of the two styles.

KEY TERMS

Romanesque

The style of European churches from about 1000 to 1150, with round arches, thick walls, small windows and heavy stone vaults.

Gothic

The style that began in France around 1140, with pointed arches, ribbed vaults, flying buttresses, great height and large stained-glass windows.

flying buttress

An arched stone support outside the wall that carries the push of the roof vault down to the ground, so the wall can be thin and full of windows.

rib vault

A stone ceiling built on crossing arched ribs, which carry the weight to a few points instead of along the whole wall.

came

An H-shaped strip of lead that holds the pieces of glass in a stained-glass window.

CORE IDEAS

In the centuries after 1000, Europe filled with new stone churches. The first great style, **Romanesque** (“in the Roman manner”), used **round arches** like the ancient Romans. A heavy stone ceiling (a barrel vault) pushes down and outward along its whole length, so Romanesque walls had to be very thick, with small windows that would not weaken them. The result is solid, strong and often dim inside, like a fortress of faith.

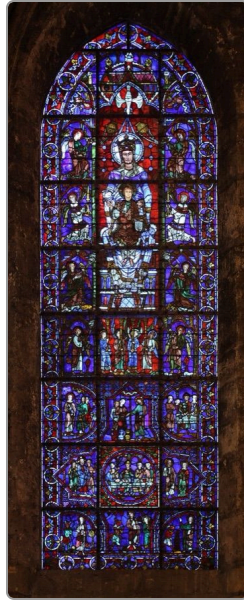
Around 1140, Abbot Suger rebuilt the choir of the Abbey of Saint-Denis near Paris to be filled with light, which he believed lifted the soul toward God. His builders combined three ideas. The **pointed arch** pushes more downward and less outward than a round arch and can rise to different heights. The **rib vault** gathers the ceiling’s weight onto a few columns. And the **flying buttress**, an arm of stone outside the building, catches the remaining outward push and carries it to the ground. Now the walls no longer held the roof up. They could become windows.

Those windows were filled with **stained glass**. Glassmakers colored molten glass by adding metal compounds: cobalt for deep blue, copper for red, iron and manganese for greens, yellows and purples. They blew it into cylinders or discs and flattened it into sheets. A glazier cut pieces to a full-size pattern, painted faces and folds with a dark paint made of powdered glass and iron oxide, and fired the pieces in a kiln so the paint fused to the glass. The pieces were then joined with H-shaped strips of lead called **comes** and set in an iron frame. The lead lines are part of the design, like the black lines in a drawing.

Romanesque and Gothic churches were Bibles for people who could not read: sculptures over the doors and windows full of Bible stories taught the faith in pictures and light. Building a great cathedral could take a century or more, so many workers labored on churches they would never see finished.

Gothic buildings lead the eye upward, with tall columns, pointed arches and spires. Think back to the leading lines of Unit 7: Gothic design is leading lines in stone.

PICTURE STUDY



Notre-Dame de la Belle Verrière (Our Lady of the Beautiful Window), Unknown glaziers of Chartres, about 1180 (central panels), surround about 1215–1220 · Stained glass · Chartres Cathedral, France

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

This window survived a great fire that destroyed most of Chartres Cathedral in 1194. When the cathedral was rebuilt, the glaziers set the old panels of Mary and the Christ Child into a new frame of angels. Its blue glass, often called “Chartres blue,” is famous around the world.

Look closely

- Find the lead lines. Do they only hold the glass together, or are they also part of the drawing?
- Compare the blue of Mary’s robe with the red background. Which seems to come forward? Which goes back?
- Look for the dark painted lines on the faces and hands. How are they different from the lead lines?
- Find the angels around Mary. What are they doing?

Talk about it

1. How would this window look different at noon, at sunset, and at night?
2. Why do you think the builders saved this window from the fire and placed it in the new cathedral?

3. The figures face us directly, like an icon. Why might that suit a window in a church?

STUDIO PROJECT

A Stained-Glass Window Panel

You will design a pointed-arch window with a simple sacred or nature subject, draw thick black “lead lines,” and fill it with translucent color so light shines through it when it hangs in a real window.

You will need

- Tracing paper or vellum, 9×12 in (or white copy paper made translucent with a light wipe of vegetable oil)
- Pencil and ruler
- Thick black permanent marker
- Bright markers or colored pencils (markers glow best)
- Black construction paper for a frame (optional)
- Tape

Steps

1. On scrap paper, draw a tall window shape with a pointed Gothic arch at the top, about 6 inches wide and 10 inches tall.
2. Inside it, design a simple subject: a dove, a lamb, a lily, a cross with vines, or a rose window pattern drawn with a compass.
3. Divide the background and the subject into pieces, the way a glazier would cut glass. Every piece must be a closed shape. Avoid pieces that are too tiny or very long and thin; real glass would break.
4. Lay the tracing paper over your design and trace every line with the thick black marker. These are your lead comes. Make them all the same thickness.
5. Color each piece with a single flat color, using a blue background and a few touches of red as the Chartres glaziers did.
6. Add a few thin painted details (eyes, feather lines, petal veins) with a fine black marker, like the glass paint fired onto real windows.
7. Frame the window with a border of black paper if you like.
8. Tape it to a sunny window and look at it from inside.

Tips

- Use more blue than any other color; it makes the reds and yellows jewel-like.
- Lead lines should run continuously from edge to edge, like the real iron and lead framework.

Check your work

- ☐ My window has a pointed Gothic arch shape.
- ☐ Every piece is a closed shape outlined with an even “lead” line.
- ☐ My colors are flat, bright and translucent.
- ☐ The design reads clearly from across the room.

SKETCHBOOK PRACTICE

1. Draw a Romanesque church and a Gothic church side by side, labeling the arches, windows and buttresses.
2. Draw a church near you from life. Which style does it borrow from?
3. Design a rose window with a compass, using a repeating pattern of six or eight sections.

From history. The cathedral of Chartres was rebuilt remarkably quickly after the 1194 fire, mostly within about 25 years, and it still has most of its original glass. During the Second World War the windows were taken out and stored safely, then put back afterward.

COMMON MISTAKES

- Drawing round arches for a Gothic window.
- Leaving open shapes that do not close, which would not hold glass.
- Using pale colors; stained glass glows only when the colors are strong.

Make it a game • Two Sides of the Room. Call one wall Romanesque and the opposite wall Gothic. Your parent calls features: thick walls, rounded arches, small windows, pointed arches, flying buttresses, big stained glass. Jump to the correct wall. Then explain how stained glass is held in lead came. Ten calls, one point each.

Scripture. “Honour and majesty are before him: strength and beauty are in his sanctuary.” (Psalms 96:6, KJV)

The Gothic builders tried to make God’s house beautiful with stone, glass and light. Strength and beauty were the goals of their craft.

8.4 THE BOOK OF KELLS AND ILLUMINATION

OBJECTIVES

- Describe how the Book of Kells was made: vellum, quills, inks and pigments.
- Recognize Celtic interlace, spirals and knotwork and draw a simple interlace.
- Illuminate an initial letter from a verse of Scripture.

Warm-up. Draw a row of four dots, then another row of four dots below it. Connect them with diagonal lines that cross like an X between each pair. Now erase tiny gaps so that each line goes over one crossing and under the next. You have started a knot.

WATCH

The astonishing Book of Kells

Smarthistory · 6:36

<https://www.youtube.com/watch?v=QWxIE-SwxQo>

WHEN TO WATCH

After the core ideas, before the picture study.

BACKUP VIDEO

Making Manuscripts

Getty Museum · 6:19

<https://www.youtube.com/watch?v=nuNfdHNTv9o>

Watch in the second session, before the studio project, to see each step of making a manuscript by hand.

KEY TERMS

illuminated manuscript

A handwritten book decorated with painted pictures, ornaments and often gold, which “illuminates” (lights up) the page.

vellum

Fine writing material made from calfskin, soaked, scraped, stretched and dried.

scriptorium

The room in a monastery where monks copied and decorated books.

interlace

A pattern of bands that weave over and under each other, as in a knot or basket.

initial

An enlarged, decorated first letter at the start of a book, chapter or verse.

CORE IDEAS

Before printing, every book was written by hand, and the most precious books were the Scriptures. Around the year 800, monks of the community founded by Saint Columba, probably working at Iona off the coast of Scotland and at Kells in Ireland, made the most magnificent book of the age: a copy of the four Gospels in Latin known as the **Book of Kells**. Today it is kept at Trinity College, Dublin.

Its 340 leaves are **vellum**, calfskin soaked in lime, scraped, stretched on frames and dried until thin and smooth; it took the skins of well over a hundred calves. The scribes wrote with **quills**, cut from goose or swan feathers. Their black-brown ink was **iron gall ink**, made from oak galls (round growths on oak trees) mixed with iron salts and gum, which bites into the vellum and lasts for centuries. The painters used colors from plants and minerals: yellow from a mineral called orpiment, green from verdigris (made from copper), reds, and blues and purples from plant dyes such as woad and other plants. Some of these colors are poisonous, and the painters handled them with care.

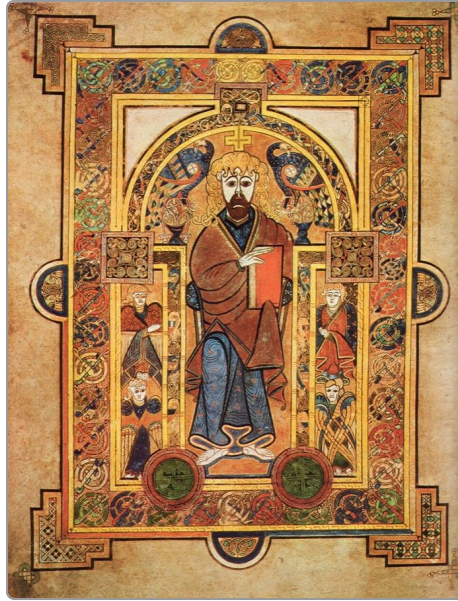
The pages are filled with Celtic designs: **spirals**, **interlace** bands that weave over and under, **knotwork**, and tiny animals and birds tangled into the letters. On the famous Chi-Rho page (the first letters of Christ's name in Greek), there are cats, mice, moths and an otter with a fish, hidden among thousands of swirls. Some details are so small that they can only be seen with a magnifying glass.

Why so much work? For the monks, copying the Gospels was a form of worship. The beauty of the page honored the Word of God it carried. A scribe might spend a whole day on a few lines, and a single decorated page might take weeks or months.

Interlace can be learned by method. Start with a grid of dots, draw diagonal lines between them, and then make each band go over one crossing and under the next,

all the way along. Finish by doubling each line into a band and shading where bands go under. Patience is the main secret.

PICTURE STUDY



Book of Kells (Christ Enthroned, folio 32v), Monks of the community of Saint Columba, about 800 · Ink and pigments on vellum · Trinity College Library, Dublin

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

This page from the Book of Kells shows Christ enthroned, holding a book, surrounded by a dense border of Celtic ornament. Like an icon, the figure faces us directly. Every inch of the page is filled with pattern.

Look closely

- Find Christ's face and hands. How is His figure like the icon you studied in Lesson 8.2?
- Look at the border. Find an area of interlace, an area of spirals and an area of knotwork.
- Find any birds or animals in the design.
- Look at the colors. How many can you name? Which are strongest?

Talk about it

1. Why do you think the monks filled almost every space with decoration?
2. How is this kind of beauty different from the beauty of a Vermeer or a Constable?
3. The monks made this book by hand over many years. What does that tell you about how they valued the Gospels?

STUDIO PROJECT

An Illuminated Initial

You will illuminate the first letter of a verse of Scripture, as the monks did, with a decorated initial, interlace, a border, and the verse written out below in your best lettering.

You will need

- Heavy drawing paper or cardstock, 9×12 in (cream or white)
- Pencil, ruler, compass
- Fine black pen
- Colored pencils or markers (deep blue, purple, red, green, yellow)
- Gold or yellow metallic marker or paint (optional)
- A verse such as Psalm 119:105 or John 1:5

Steps

1. Choose your verse. Its first letter will be your initial (for Psalm 119:105, “T” for “Thy word”).
2. In the upper left of your paper, draw the letter large, about 4 inches tall, with thick strokes. Make it double-lined so it has width you can fill.
3. Fill the strokes of the letter with a simple interlace, spirals or a pattern of small shapes. Use the dot-and-diagonal method from the warm-up for the interlace.
4. Add a small animal or bird whose body or tail weaves into the letter.
5. Draw a border around the page, about $\frac{3}{4}$ inch wide, with a repeating knot, step pattern or vine.
6. Rule light guidelines below the initial and write the rest of the verse in neat, even letters with the fine pen.
7. Ink all the outlines of the initial and border with the fine pen.
8. Color with strong, flat colors, using no more than five. Add gold to the letter or border if you have it.
9. Write the reference and the date small at the bottom.

Tips

- Plan the interlace in pencil first; ink only when every over-under is correct.
- Turn the paper as you color so your hand does not smudge the ink.

Check your work

- ☐ My initial is large, decorated and includes interlace or spirals.
- ☐ My page has a border with a repeating pattern.
- ☐ The verse is written neatly on ruled guidelines.
- ☐ My colors are strong and harmonious.

SKETCHBOOK PRACTICE

1. Practice three different interlace knots using the dot grid method.
2. Draw a fanciful bird or dog whose tail and ears turn into interlace.
3. Copy a section of the Chi-Rho page border at large size.

From history. In 1007 the Book of Kells was stolen from the church at Kells, and its jeweled cover was torn off. The book itself was found a few months later under a sod of earth, missing its cover but otherwise saved. It has been in Dublin since the 1660s, and visitors can see a different page turned every few weeks.

COMMON MISTAKES

- Interlace that goes under twice in a row. Each band should alternate: over, under, over, under.
- Writing the verse without guidelines, so the lines slant.
- Too many colors, which makes the page look busy instead of rich.

Make it a game • Over-Under Knot. Draw an interlace braid with two ribbons that go over, then under, at every crossing. Your parent checks that the pattern alternates all the way. Then name the stages in making a manuscript: vellum, quills, inks, scriptorium. Finally draw an initial letter with a knot. Score a point for each correct crossing.

Scripture. “Thy word is a lamp unto my feet, and a light unto my path.” (Psalms 119:105, KJV)

The monks “illuminated” the Gospels with color and gold because they believed God’s Word gives light. Your illuminated letter is a small act of the same honor.

UNIT 8

ART FROM ANCIENT TO MEDIEVAL

This unit is a journey through about three thousand years of art, from the painted tombs of Egypt to the illuminated Gospels of Ireland. These artists did not use the perspective or the soft modeling you practiced this year, and not because they could not see. They chose different goals: permanence and order in Egypt, heavenly light and holiness in Byzantium, soaring height and color in the Gothic cathedrals, and intricate praise in the pages of the Book of Kells.

In each lesson you will look closely at one great work, learn how and why it was made (often with surprising material science), and make something with your own hands using the same methods: drawing on an Egyptian grid, setting a paper mosaic, designing a stained-glass window, and illuminating a letter. You will see that much of the greatest art of these centuries was made for the worship of God, by makers who often left no names.

PREREQUISITES

- Knows the elements and principles of design (Unit 1)
- Understands linear perspective (Unit 6) and notan (Unit 7), to compare with flat, patterned styles
- Can use a ruler, compass and fine pen

MASTERY CHECKLIST

- ☐ I can describe the conventions of Egyptian painting, such as composite view and the proportion grid.
- ☐ I can explain how Byzantine mosaics and icons were made and why they look as they do.
- ☐ I can tell Romanesque from Gothic architecture and explain how stained glass is made.
- ☐ I can describe how the Book of Kells was made and draw a simple interlace pattern.
- ☐ I can place these works in order on a timeline.

LESSONS IN THIS UNIT

8.1 Egyptian Art

2 sessions of 50 minutes

8.2 Byzantine Mosaics and Icons

2 sessions of 50 minutes

8.3 Romanesque and Gothic: Churches of Stone and Light

2 sessions of 50 minutes

8.4 The Book of Kells and Illumination

2 sessions of 50 minutes

UNIT 8 REVIEW

Answer each question. Questions 11 and 12 should be written in complete sentences.
100 points total.

1. (7 pts)

What is composite view in Egyptian art? Give an example.

2. (7 pts)

What was the purpose of the grid in Egyptian figure drawing?

3. (7 pts)

How was Egyptian blue made?

4. (7 pts)

What are tesserae, and how were gold tesserae made?

5. (7 pts)

Why do Byzantine mosaics sparkle?

6. (7 pts)

What is encaustic, and what is egg tempera?

7. (7 pts)

Name three differences between Romanesque and Gothic churches.

8. (7 pts)

What does a flying buttress do?

9. (7 pts)

How was stained glass colored, and what holds the pieces together?

10. (7 pts)

What is vellum, and what was iron gall ink made from?

11. (15 pts)

Written answer: Compare the Sinai *Christ Pantocrator* with Christ in the Book of Kells. How are they alike and different in purpose, materials and style?

12. (15 pts)

Written answer: Explain how Gothic builders turned church walls into walls of light. Include at least three architectural features and how stained glass was made.

ANSWER KEY

1. Showing each part from its clearest angle in one image, such as a profile head with a front-view eye and front-view shoulders, or a pool seen from above with trees seen from the side.
2. It was a canon of proportion that kept figures consistent, so many artists could draw the same proportions for centuries.
3. By heating sand, a copper mineral and lime together until they fused into blue crystals, then grinding them into pigment.
4. The small pieces of a mosaic. Gold tesserae were made by fusing gold leaf between glass layers.
5. The tesserae are glass and gold set at slightly different angles, so they catch the light differently as you move.
6. Encaustic is pigment in hot melted beeswax; egg tempera is pigment mixed with egg yolk and water.
7. Round vs. pointed arches; thick walls vs. thinner walls with flying buttresses; small windows vs. large stained-glass windows; barrel vaults vs. rib vaults; heavy vs. tall and soaring.
8. It carries the outward push of the vault down to the ground outside the wall, so the walls can be thin and filled with windows.
9. Metal compounds were added to molten glass (cobalt for blue, copper for red); the pieces are held together by H-shaped lead strips called comes in an iron frame.
10. Vellum is prepared calfskin; iron gall ink was made from oak galls, iron salts and gum.
11. Model: Both show Christ facing the viewer directly, holding the Gospels, to present Him as holy and present rather than as part of a scene. Both were made for worship by unnamed makers in monasteries. The Sinai icon is painted in encaustic on wood, with soft modeling of the face and a real background; the Kells page is ink and pigments on vellum, flat and patterned, surrounded by interlace and spirals, so the figure becomes part of an ornamental design.
12. Model: Pointed arches pushed weight more downward, rib vaults gathered the ceiling's weight onto a few columns, and flying buttresses outside carried the remaining outward push to the ground. Because the walls no longer had to hold the roof, they could be opened into huge windows. These were filled with

stained glass: glass colored with metal compounds, cut to patterns, painted with dark glass paint and fired, then joined with lead comes in iron frames.

PORTFOLIO PIECE: AN ILLUMINATED PAGE IN AN ANCIENT OR MEDIEVAL STYLE

Make one finished page, 9×12 in or larger, in the style of one of this unit's traditions: an illuminated Scripture verse with a decorated initial and border, an icon-style image with a gold background, a stained-glass design, or an Egyptian-style scene on a grid. On the back, write a short museum label naming the style, the materials the original artists used, and how your piece imitates their method.

LOOK FOR	WHAT IT MEANS
Faithful to the style	The piece clearly uses the conventions of its tradition (composite view, gold ground, lead lines, or interlace).
Design	Strong, readable composition with balanced pattern and a clear focal point.
Color and line	Flat, strong colors and clean, steady lines suited to the style.
Craftsmanship and patience	Careful, unhurried work with even patterns and no smudges; signed and dated.
Museum label	The label correctly explains the original materials and methods.