

Perspective Drawing

Big Ideas

Unit of Instruction

Perspective Drawing

Geometry Concept

- Lines and planes in space

Rationale

This is a great unit to prove the difference between what we think we see and what actually exists in the physical world. Students will use geometric terms and concepts to prove the existence of parallel lines where our brains visualize lines moving together in the distance.

Linear perspective is a mathematical system for creating the illusion of space and distance on a flat surface. This system originated in Florence, Italy in the early 1400's. The artist and architect Brunelleschi demonstrated its principles, but another architect and writer, Leon Battista Alberti was first to write down rules of linear perspective for artists to follow.

The **horizon line** runs across the canvas at the eye level of the viewer. The horizon line is where the sky appears to meet the ground.

The **vanishing point** should be located near the center of the horizon line. The vanishing point is where all parallel lines (orthogonals) that run towards the horizon line appear to come together like train tracks in the distance.

Orthogonal lines are "visual rays" helping the viewer's eye to connect points around the edges of the canvas to the vanishing point. An artist uses them to align the edges of walls and paving stones.

Idaho Content Standards

- G.4.1.1 (skill b) Use accepted geometric notation for lines, planes, segments, rays, angles, similarity, and congruence.
- G.4.1.3 Establish the validity of geometric conjectures.
- G.4.3 Apply transformations and use symmetry to analyze mathematical situations.
- 9-12. VA.1.1.1 Identify representative visual works of art from a variety of cultures and historical time periods.

Background	
Vocabulary	
2-D to 3-D	One-Point Perspective
Angles	Parallel Lines
Horizon Line	Rays
Line	Two-Point Perspective
Line Segments	Vanishing Point
<p>Math Instruction (pre- or post-project) Initiating Activity: Introduce geometric concepts specific to a two-dimensional representation of a three-dimensional landscape or cityscape. Culminating Activity: Apply geometric concepts learned while completing an accurate representation of a landscape or cityscape.</p>	
Driving Question	
Project objective	
To understand the connection between geometry and perspective drawing.	
Questions to be answered	
How does geometry drive perspective? How is geometry a fundamental concept in the real world? How has perspective influenced the art world?	

Materials

Materials required

Drawing Paper

Pencils

Erasers (acrylic or kneadable)

Rulers

Art Prints: Pre-Renaissance architectural and Post-Renaissance architectural

Digital Camera

Reference Materials

Dartmouth Website: Geometry in Art & Architecture Unit 11

<http://www.dartmouth.edu/~matc/math5.geometry/unit11/unit11.html>

<http://www.termespheres.com>

Louvre Website

Vatican Website

Art Prints: Pre-Renaissance architectural and Post-Renaissance architectural

Raphael: *School of Athens* or another example

Lesson Outline

Day One

5 minutes: Provide photos and physical examples for students to analyze and draw conclusions about distance and what appears to happen as objects recede into the distance.

10 minutes: Class discussion about perspective drawing (see handout on page 6)

10 minutes: Teacher demonstration and student participation on perspective drawing with mathematical concepts highlighted – see discussion question handout, page 6.

5 minutes: Introduce assignment for next day: Be prepared to take a “perspective hike” to find an actual landscape or cityscape to record digitally. The students should wear appropriate walking shoes and clothing, and bring a digital camera if they own one. They will be shooting pictures including buildings of different heights, sidewalks, windows, doors, streets with medians, etc.). Should the teacher not be able to take a “perspective hike”, this should be assigned as homework.

Optional extras: include people, mailboxes, park benches, trees, light poles, banners, signs, flags, awnings, outdoor cafes, automobiles, railroad tracks, etc.

Day Two

35 minutes: Begin “Perspective Hike” looking for examples that illustrate a clear vanishing point and horizon line. Shoot several pictures for examples.

15 minutes: Review photos and choose to print those needed for perspective drawings.

Optional:

Students may choose to shoot their photos out of class as homework, or the teacher can bring developed pictures to class.

Review how to draw a rectangular prism, always establishing the horizon line and vanishing point.

Day Three

5 minutes: Review lesson on horizon lines and vanishing points as they appear on their chosen photographs.

45 minutes: Students work on perspective drawings.

Note: It would be best for Day Three to be on a Friday for students to have extended time to complete perspective drawing as homework.

Day Four

5 minutes: Review perspective concepts and check students' work for accuracy.

40 minutes: Students continue to work on their drawings adding detail and shading.

5 minutes: When finished, students will display their work on classroom walls.

Assessment

Rubric

Perspective Drawing (100 points possible)

Accuracy in portraying horizon line and vanishing point: 80 points

Addition shading and detail: 20 points

Ideas for Further Independent Student Project

Present and discuss the following as possible extension activities on Day Four:

Adding curved arches, people, objects, wheels

Possibilities for Senior Project

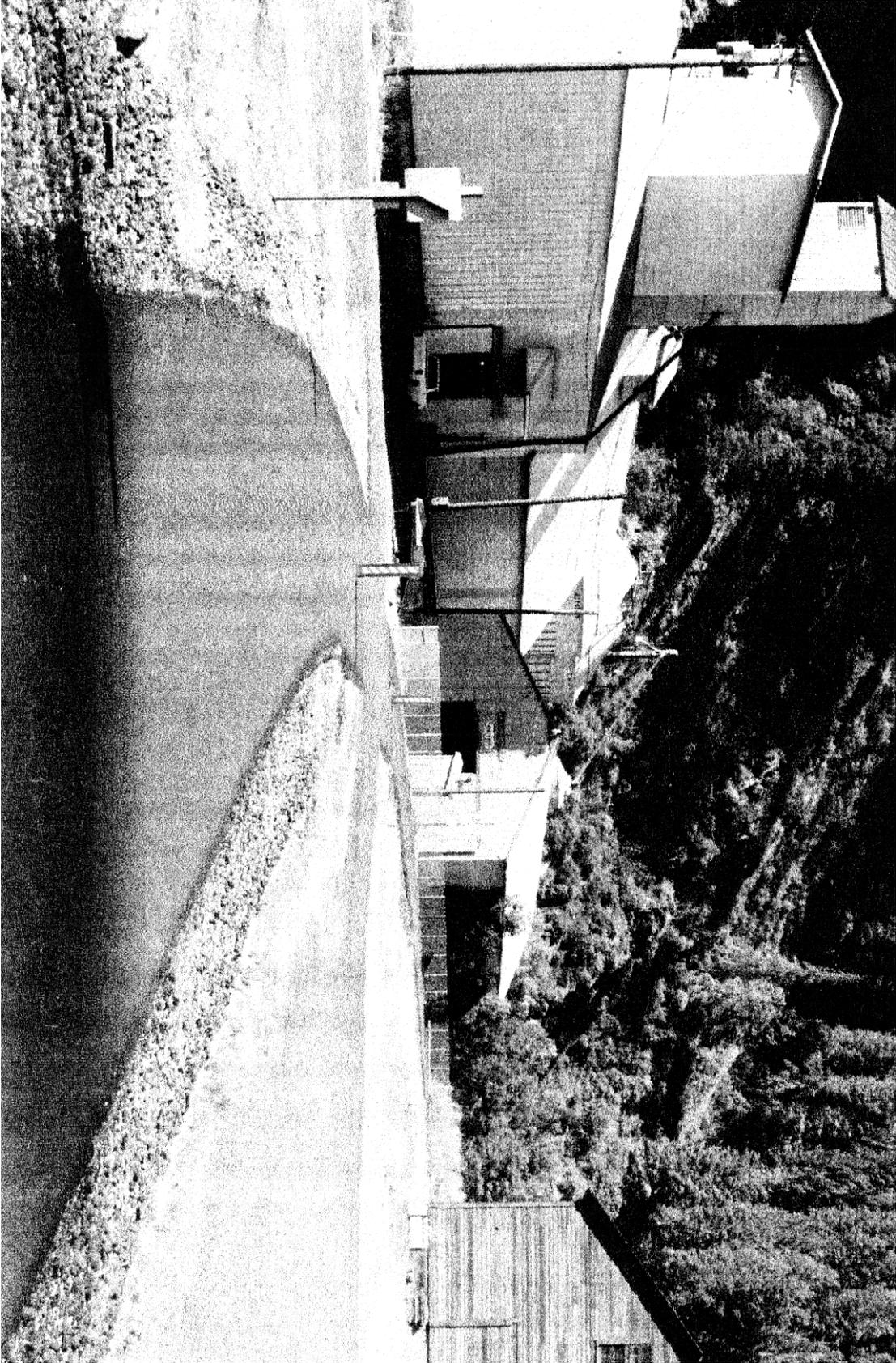
Create a series of drawings using two-point perspective

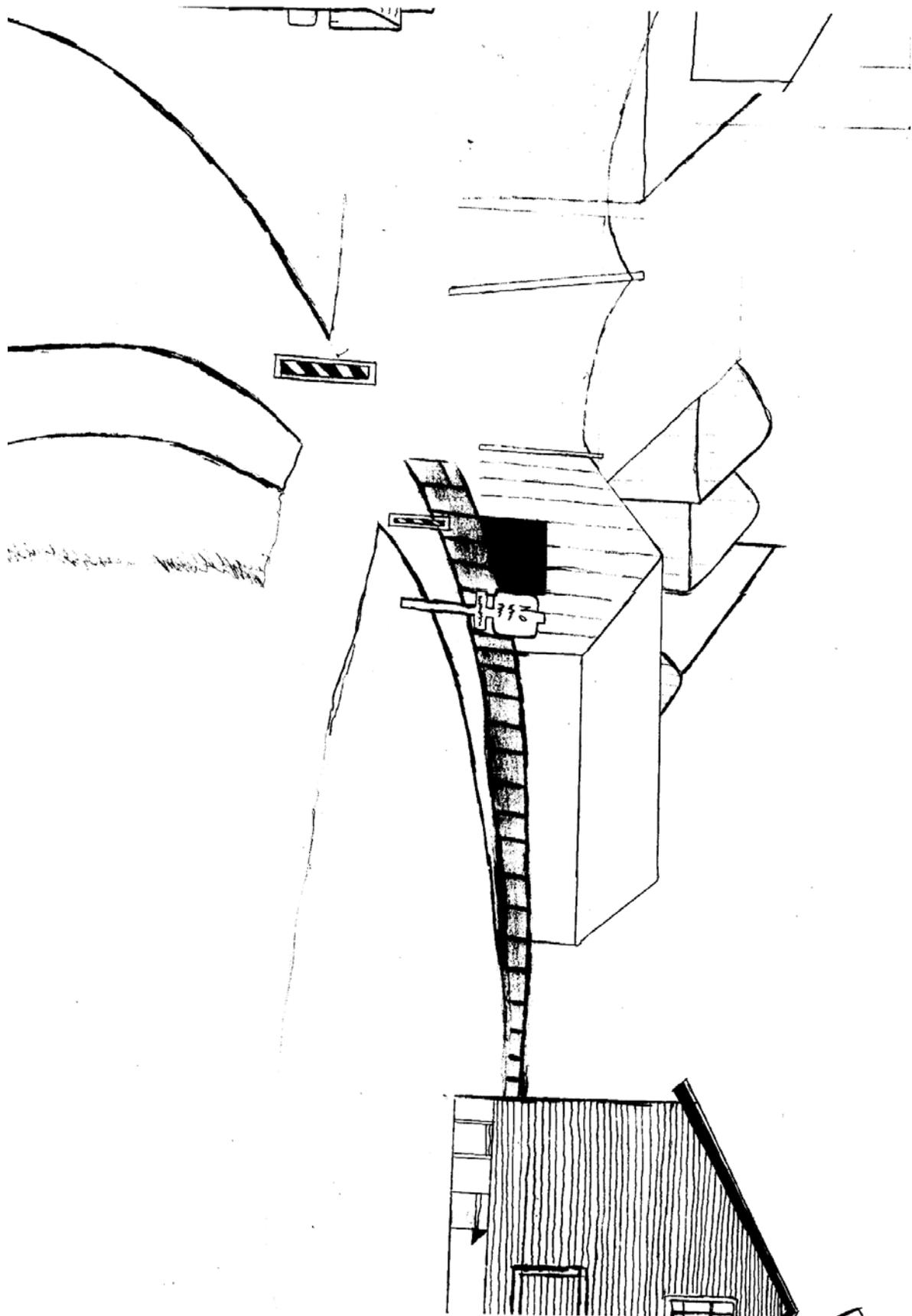
Using the computer program Geometry Sketchpad, create a perspective portfolio

Create a series of drawings using several different vantage points

Possible Questions to Discuss During Perspective Presentation

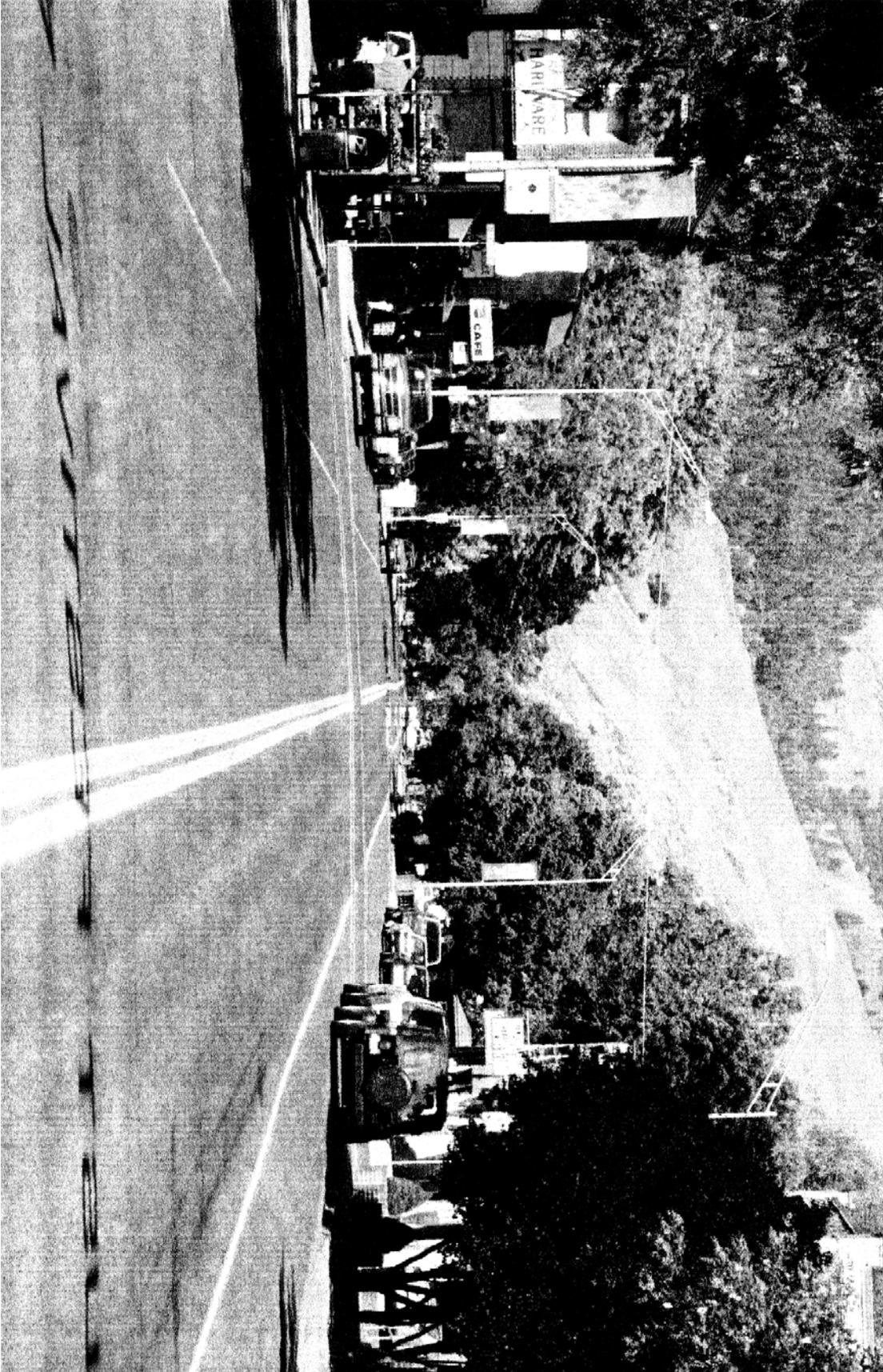
1. What is a line?
2. What is infinity?
3. How can you visualize infinity?
4. What is a point on a line?
5. What are rays?
6. What are line segments?
7. What is distance?
8. What is perceived distance?
9. How would you represent distance in a two dimensional way?
10. How can the distance between railroad ties reflect diminishing and increasing distance? (geometric sequence)
11. How do you draw a rectangular prism?
12. How would you represent objects diminishing into the distance?
13. What geometric tools and concepts are represented by doing so?
14. What artistic skills are used to create the illusion of diminishing lines into the distance?

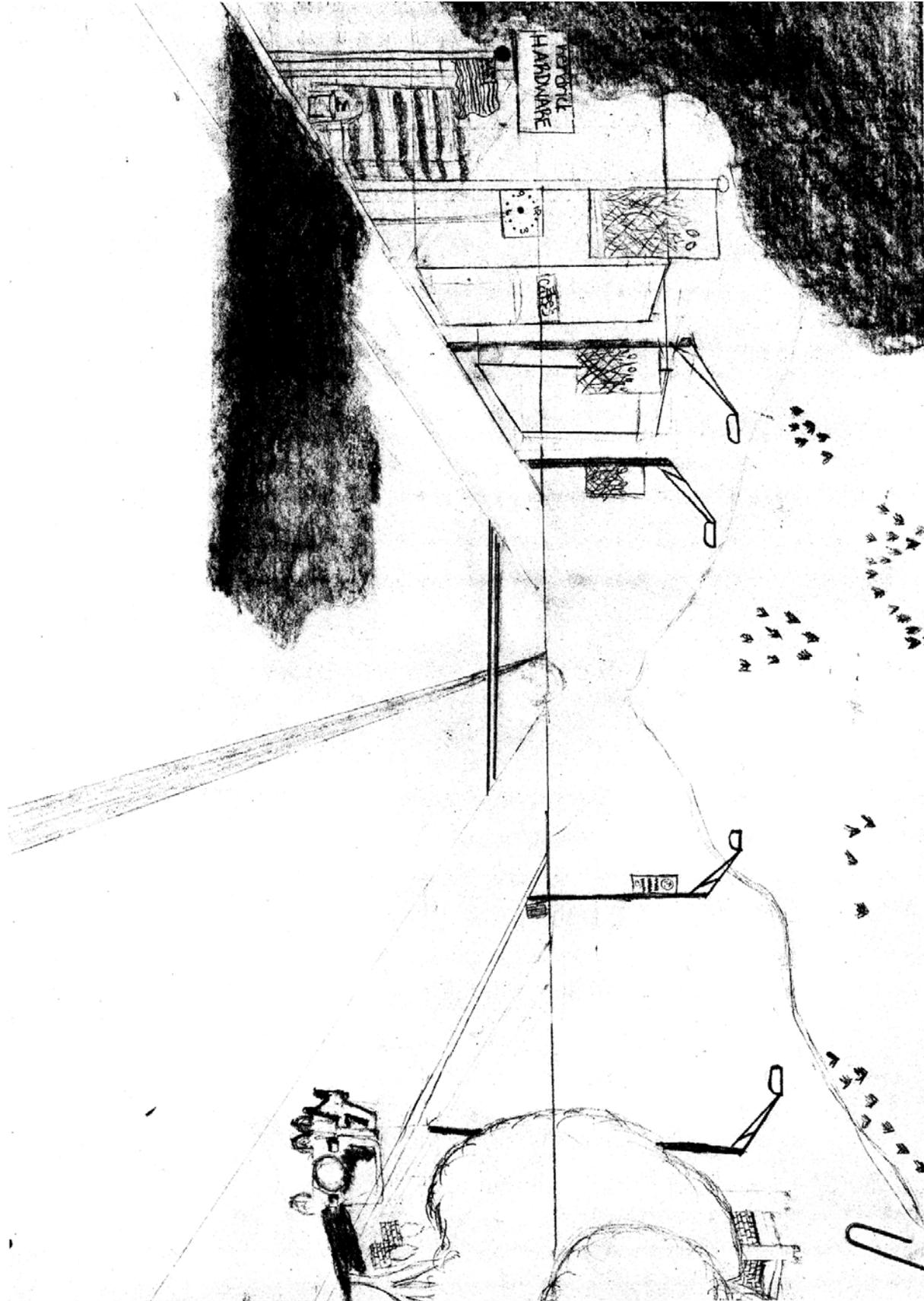










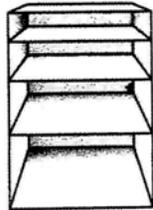


Quiz

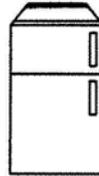
Name: _____ Date: _____

State whether each object is in one or two point perspective.

1.



2.



3.



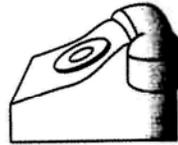
4.



5.



6.



7. Sketch a cube in one point perspective.

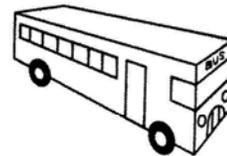
8. Sketch a cube in two point perspective.

Use your ruler to help you locate the vanishing point (points) for each figure.

9.



10.



Quiz

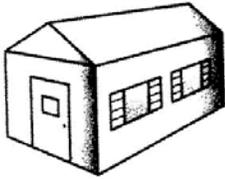
Name: _____ Date: _____

1. Sketch a cube in one point perspective.

2. Sketch a cube in two point perspective.

Use your ruler to help you locate the vanishing point (points) for each figure.

3.

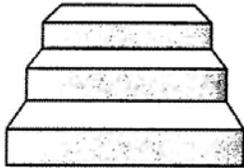


4.



State whether each object is in one or two point perspective.

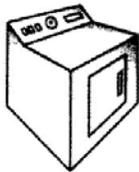
5.



6.



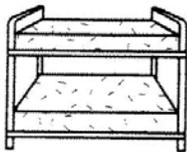
7.



8.



9.



10.

