



Geometry - Scale Drawing



National Standards

Instructional programs for Geometry grades 6th-8th should enable all students to:

- Recognize and apply geometric ideas and relationships in areas outside the mathematics classroom, such as art, science, and everyday life
- draw geometric objects with specified properties, such as side lengths or angle measures

21st Century Skills

Learning and Innovation Skills

Critical Thinking and Problem Solving

Exercising sound reasoning in understanding

Understanding the interconnections among systems

Identifying and asking significant questions that clarify various points of view and lead to better solutions

Framing, analyzing and synthesizing information in order to solve problems and answer questions

Creativity and Innovation

Acting on creative ideas to make a tangible and useful contribution to the domain in which the innovation occurs

Life and Career Skills

Initiative & Self-Direction

Defining, prioritizing and completing tasks without direct oversight

Utilizing time efficiently and managing workload

Leadership & Responsibility

Using interpersonal and problem-solving skills to influence and guide others toward a goal

**Texas
Essential
Knowledge
& Skills
(TEKS)**

Mathematics 6.4 (G) Proportionality.

The student applies mathematical process standards to develop an understanding of proportional relationships in problem situations. The student is expected to:

- (G) generate equivalent forms of fractions, decimals, and percents using real-world problems, including problems that involve money;

Mathematics 6.5 (A) Proportionality.

The student applies mathematical process standards to solve problems involving proportional relationships. The student is expected to:

- (A) represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions;

Mathematics 3.5 (A, B, D) Geometry and measurement.

The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties. The student is expected to:

- (A) create two-dimensional shapes based on given attributes, including number of sides and vertices;
- (B) classify and sort three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes as special rectangular prisms), and triangular prisms, based on attributes using formal geometric language;
- (D) compose two-dimensional shapes and three-dimensional solids with given properties or attributes;

Mathematics 2.7 (B) Proportionality.

The student applies mathematical process standards to use geometry to describe or solve problems involving proportional relationships. The student is expected to:

- (B) solve mathematical and real-world problems involving similar shape and scale drawings.

Objective

In this activity students will study and create scale drawings

Materials

- Function Table activity sheet with Rubik's Cube
- Display Picture
- Large white paper
- Colored pencils

Procedure

Begin by reading the problem to the students:

- You are part of an elite marketing team that has just been asked to create an advertising campaign for the new Rubik's Cube! As your team prepares for the presentation, you try to retrieve your scale drawing of the Rubik's Cube from your computer and... it crashes! You are able to recover most of the files BUT the large scale drawing has been lost. You must now sketch the Rubik's Cube picture to use as a visual aid at the presentation with the Rubik's Cube, Inc. president. The team has decided to use the ratio 1cm (Rubik's Cube display picture) = 5 cm (sketch). Complete the function table for the dimensions and draw the sketch of the Rubik's Cube picture. Be sure to include a top view and side view.
- Give each student a Function Table activity sheet and a large sheet of white paper to sketch on.
- Students should each create their own sketch, but collaboration should be encouraged throughout the planning process.
- After students have created a scale drawing of the Rubik's Cube, they can design the rest of the advertising poster.
- Alternately, students could create scale drawings after measuring actual Rubik's Cubes, instead of the Display Picture.
- Students can also be assigned, or choose, different scale ratios to sketch.

Geometry Lesson - Scale Drawing

Name _____ Date _____

Function Table Activity Sheet

Dimensions (side view)	Rubik's Cube Display Picture measurement (x)	Scale measurement (y) $y = 5x$	Sketch (y)
Length			
Height			
Depth			

Rubik's Cube Display Picture

