



# 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

## 21<sup>st</sup> 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

## Common Core State Standards

### Ratios & Proportional Relationships

*Understand ratio concepts and use ratio reasoning to solve problems.*

**6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

**6.RP.A.3** Use ratio and rate reasoning to solve real world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the values on the coordinate plane. Use tables to compare ratios.

### Geometry

*Draw, construct, and describe geometrical figures and describe the relationships between them.*

**7.G.A.1** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

**7.G.A.2** Draw (freehand, with ruler and protractor, and with technology) geometric shapes including polygons and circles with given conditions.

## 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.

## Procedure

- 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

