

SCALE DRAWING

Subject

Mathematics

Prepared By

[Instructor Name]

Grade Level

5

Overview

This lesson plan covers teaching content for;

1. Solving 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.

Objectives

Students should be able to;

1. Understand the components of 'scale drawing'
2. Create figures or drawings using the scale factors to figure out the sizes of the objects
3. Make collages and use rulers to create scale drawings and find real-life dimensions of objects.

Activity Starter/Instruction

1. A scale drawing is a drawing of an object/place in which all measurements are changed proportionately.
2. A map cannot be of the same size as the area it represents. So, the measurements are scaled down to make the map of a size that can be used.
3. Students should be given copies of a simple map showing a school campus; a sheet of letter sized paper; diagram of three bats of varied sizes; ½ sheet cartridge paper with cm grid and a small 5cm print of a community plan on it (one per group).
4. Engage the students by saying: Look at the pictures before you.
5. Ask: How are they similar?
6. What makes them different?
7. Discuss similarities and differences among the photographs.
8. Highlight the fact that regardless of the size of the pictures the images are the same.

Teacher Guide

Day 1/ Lesson 1: 20mins

1. Introduce students to the concept of scale through maps and globes. Use a large map to demonstrate the scale measurements for distance.
2. Calculate the distance between two map points by converting the scale measurement to miles or kilometers.
3. Divide the class into groups of four students; let each group examine several maps and globes, either in the classroom, in their textbooks or on the Internet.
4. Groups record the various scales used on the maps and calculate the distance between two points on each map.
5. After they have done their research, ask the students to re-create a map of their state using their own scale measurements.
6. Calculate the distance from the students' town to the state capitol on each map according to the scale provided and discuss which maps seem accurate and which seem inaccurate.

Materials Required

- Large drawing paper
- Rulers
- Pencils
- Home design magazines
- Scissors
- Glue sticks
- White board
- Marker
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Additional Resources

- https://learnzillion.com/lesson_plans/28463-lesson-7-drawings/?card=311914
- https://www.mathsteacher.com.au/year8/ch06_ratio/
- <http://www.cpalms.org/Public/PreviewResourceLesson>
- <https://www.ck12.org/book/CK-12-Middle-School-Math-6/section/8.4/>
- <https://betterlesson.com/lesson/434835/scale-drawing>
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Additional Notes

Guided Practice

Day 3/ Lesson 3: 15 Mins

1. Suppose a problem tells you that the length of a vehicle is drawn to scale. The scale of the drawing is 1:20.
2. If the length of the drawing of the vehicle on paper is 12 inches, how long is the vehicle in real life?
3. Set up a proportion that will look like this:
4.
$$\frac{\text{Length of drawing}}{\text{Real length}} = \frac{1}{20}$$
5. Do a cross product by multiplying the numerator of one fraction by the denominator of the other fraction.
7. $\text{Length of drawing} \times 20 = \text{Real length} \times 1$
8. Since length of drawing = 12, we get
9. $12 \times 20 = \text{Real length} \times 1$
10. 240 inches = Real length
11. Students should practice on their own:
12. The scale drawing of a tree is 1: 500.
13. If the height of the tree on paper is 20 inches, what is the height of the tree in real life?

Guided Practice

Day 3/ Lesson 3: 20mins

1. Provide students with a variety of home design magazines (or ask students to bring in their own). Students will have 20 minutes to browse through the magazines and cut out ideas for their own "dream houses" that they would like to build someday.
2. After cutting out their pictures, introduce the idea of drawing a floor plan for a house. Encourage students to make a pre-design collage, placing the ideas for their houses in the approximate layout of how they would like their homes to be designed.
3. Demonstrate how to draw a basic floor plan for a house, using a "bird's eye" view and drawing the shapes of rooms with flat squares and rectangles (for this activity, you may want to discourage circles unless students are interested in an additional challenge).
4. Give students time to draw their floor plans, asking them to label each room and to measure and note dimensions (in inches) of each room.
5. Introduce a basic scale, drawing it on the board (example 1 inch = 3 feet). Using the sample floor plan drawn for the first portion of the lesson, demonstrate how to use the scale to calculate the actual dimensions of each room.
6. Give students time to apply their scales to find the dimensions of each room shown on their floor plans.
7. Students will fill in their charts accordingly and write the square footage of each room under the label for each room on the blueprints.

Summary	Assessment Activity	Assessment Activity
1. Volunteers should proffer solution to problems and teacher makes sure students understand the concept of scale drawing.	1. As students complete the practice questions, circulate the room and provide assistance in solving the problems correctly as needed.	Assess if students can; 1.Create figures or drawings using the scale factors to figure out the sizes of the objects correctly.