





Lesson 7

Scale Drawings





Unit 1 • Lesson 7

Let's explore scale drawings.









Warm-up

Here are some drawings of a school bus, a quarter, and the subway lines around Boston, Massachusetts. These first three drawings are **scale drawings** of these objects.





These three drawings are *not* scale drawings of these objects.





Discuss with your partner what a scale drawing is.



Unit 1 \bullet Lesson 7 \bullet Activity 1





Warm-up

- What do the examples have or show that the counterexamples do not?
- How are scale drawings like scaled copies you saw in earlier lessons? How are they different than scaled copies?
- What aspects of the bus, coin, and the city of Boston do the scale drawings show? What aspects of the actual objects do scale drawings *not* show?







Your teacher will give you a scale drawing of a basketball court. The drawing does not have any measurements labeled, but it says that 1 centimeter represents 2 meters.

1. Measure the distances on the scale drawing that are labeled a–d to the nearest tenth of a centimeter. Record your results in the first row of the table.

measurement	(a) length of court	(b) width of court	(c) hoop to hoop	(d) 3 point line to sideline
scale drawing				
actual court				

- 2. The statement "1 cm represents 2 m" is the **scale** of the drawing. It can also be expressed as "1 cm to 2 m," or "1 cm for every 2 m." What do you think the scale tells us?
- 3. How long would each measurement from the first question be on an actual basketball court? Explain or show your reasoning.





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- 4. On an actual basketball court, the bench area is typically 9 meters long.
 - a. Without measuring, determine how long the bench area should be on the scale drawing.
 - b. Check your answer by measuring the bench area on the scale drawing. Did your prediction match your measurement?







Sizing Up a Basketball Court





- Does "1 cm for every 2 m" mean that the actual distance is twice that on the drawing? Why or why not?
- Which parts of the court should be drawn by using "1 cm for every 2 m" rule?
- Can we reverse the order in which we list the scaled and actual distances? For example, can we say "2 m of actual distance to 1 cm on the drawing" or "2 m to 1 cm"?



Unit 1 • Lesson 7 • Activity 2





Here is a scale drawing of some of the world's tallest structures.



- 1. About how tall is the actual Willis Tower? About how tall is the actual Great Pyramid? Be prepared to explain your reasoning.
- 2. About how much taller is the Burj Khalifa than the Eiffel Tower? Explain or show your reasoning.
- 3. Measure the line segment that shows the scale to the nearest tenth of a centimeter. Express the scale of the drawing using numbers and words.



Unit 1 • Lesson 7 • Activity 3





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- Besides height information, what other information about the towers does the drawing show?
- What information does it not show?
- How is this scale drawing the same as that of the basketball court? How are they different?









- What is a **scale drawing**?
- How can we describe the scale for a scale drawing?
- How do we find distances using a scale drawing?







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Unit 1 • Lesson 7

- I can explain what a scale drawing is, and I can explain what its scale means.
- I can use actual distances and a scale to find scaled distances.
- I can use a scale drawing and its scale to find actual distances.

Learning Targets







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- 1. A scale drawing of a school bus has a scale of $\frac{1}{2}$ inch to 5 feet. If the length of the school bus is $4\frac{1}{2}$ inches on the scale drawing, what is the actual length of the bus? Explain or show your reasoning.
- 2. A scale drawing of a lake has a scale of 1 cm to 80 m. If the actual width of the lake is 1,000 m, what is the width of the lake on the scale drawing? Explain or show your reasoning.



Glossary



scale

A scale tells how the measurements in a scale drawing represent the actual measurements of the object.

For example, the scale on this floor plan tells us that 1 inch on the drawing represents 8 feet in the actual room. This means that 2 inches would represent 16 feet, and $\frac{1}{2}$ inch would represent 4 feet.







Glossary



scale drawing

A scale drawing represents an actual place or object. All the measurements in the drawing correspond to the measurements of the actual object by the same scale.









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