

Scale It Up

Use a model scale to compare small drawings with real science systems.

GRADE 4 • TEKS 4.5

4.5 "Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines..."

NAME _____

DATE _____

USING A SCALE

A scale tells how much one unit on a model represents in the real world. Multiply to find a real measurement from a model, and divide to find a model measurement from a real object.

WORKED EXAMPLE

A scale model of a creek is 4 cm long. Each centimeter represents 6 m. How long is the real creek?

1. The model length is 4 cm.
2. Each centimeter represents 6 m.
3. Multiply $4 \times 6 = 24$.

Answer: 24 m

PRACTICE 6 problems

- 1** A worm-tunnel diagram is 3 cm long. Each centimeter represents 5 cm of a real tunnel. How long is the real tunnel?

ANSWER _____

- 2** Each centimeter on a leaf model represents 7 mm of a real leaf. A real leaf is 35 mm long. How long is the model leaf?

ANSWER _____

- 3** A root model is 9 cm long. Each centimeter represents 8 mm of a real root. How long is the real root?

ANSWER _____

- 4** On a weather map, each centimeter represents 10 km. Two storm clouds are 11 cm apart on the map. How far apart are they in real life?

ANSWER _____

- 5** A model of an aquarium pipe system uses a scale of 12 cm in real life for each centimeter on the model. A real pipe is 84 cm long. How long is the pipe on the model?

ANSWER _____

- 6** In a cell diagram, each centimeter represents 14 micrometers. An organelle measures 2 cm on the diagram. What is its real length?

ANSWER _____

APPLY IT Show your work

- 1** Your class is planning a pollinator garden. On the scale plan, each centimeter represents 7 m. The rectangular garden is 8 cm long and 3 cm wide on the plan. What are the real length and width of the garden? What is its real area?

WORK SPACE

ANSWER _____

- 2** A wildlife club makes a scale map of two birdwatching trails. Each centimeter on the map represents 25 m. One real trail is 175 m long, and another real trail is 75 m long. How long should each trail be on the map?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A model of a water-filter system has a tube that is 5 cm long. The real tube is 45 cm long. Another real tube is 108 cm long. How long should the second tube be on the model? Explain how you found the scale.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A worm-tunnel diagram is 3 cm long. Each centimeter represents 5 cm of a real tunnel. How long is the real tunnel?	15 cm
2	Each centimeter on a leaf model represents 7 mm of a real leaf. A real leaf is 35 mm long. How long is the model leaf?	5 cm
3	A root model is 9 cm long. Each centimeter represents 8 mm of a real root. How long is the real root?	72 mm
4	On a weather map, each centimeter represents 10 km. Two storm clouds are 11 cm apart on the map. How far apart are they in real life?	110 km
5	A model of an aquarium pipe system uses a scale of 12 cm in real life for each centimeter on the model. A real pipe is 84 cm long. How long is the pipe on the model?	7 cm
6	In a cell diagram, each centimeter represents 14 micrometers. An organelle measures 2 cm on the diagram. What is its real length?	28 micrometers

PART 2 • APPLY IT

- 56 m long, 21 m wide, and 1,176 square meters.** Multiply each plan measurement by 7 to find 56 m and 21 m. Then multiply 56×21 to find an area of 1,176 square meters.
- The 175 m trail should be 7 cm, and the 75 m trail should be 3 cm.** Divide each real distance by 25. $175 \div 25 = 7$ and $75 \div 25 = 3$.

CHALLENGE

12 cm. $45 \div 5 = 9$, so each centimeter on the model represents 9 cm in real life. Then $108 \div 9 = 12$.

Accept correct equivalent number sentences and correct units. For the challenge, accept any clear explanation that finds the scale as 9 real centimeters for each model centimeter.