

Scale Factor Power

Use ratios in tables, graphs, scale factors, and proportions.

GRADE 6 • TEKS 6.5.A

6.5.A "represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions;"

NAME _____

DATE _____

Connect the representations

Equivalent ratios multiply both quantities by the same factor. A table lists matching quantities; a proportional graph passes through (0,0). Keep the same unit order on both sides of a proportion.

Model (cm)	Actual (m)
1	3
2	6

Worked example

A scale uses 1 cm for 3 m. What does 2 cm represent?

Multiply both quantities by 2. Keep centimeters above meters in both ratios.

6 m; $1/3 = 2/6$.

Use the supplied tables and graphs. Show calculations and explain the relationships. Label plotted points as requested.

1. Enlarge a scale drawing

A model uses 2 cm for every 5 m of real length. A path is 8 cm on the model. State the scale factor from 2 to 8, write a proportion, and find the actual length.

Model (cm)	Actual (m)
2	5
8	

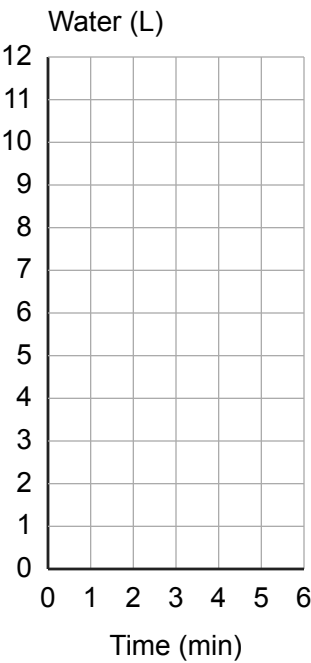
2. Complete a ratio table

A paint mixture uses 2 cups of blue for every 3 cups of white. Complete the table. Explain why adding 2 to both quantities in the first row would not keep the ratio.

Blue (cups)	White (cups)
2	3
4	
6	
8	

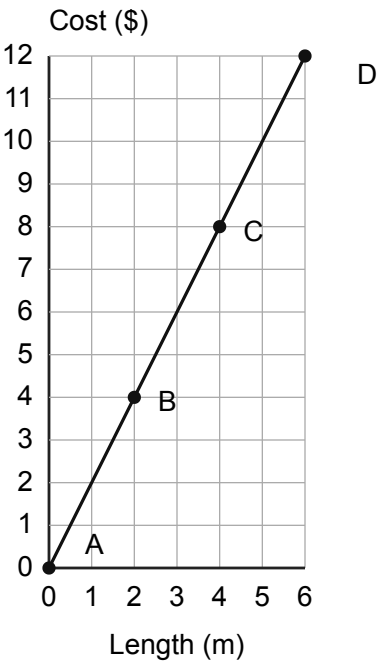
3. Build a rate graph

Water flows at 2 liters per minute. Use the blank grid to plot A(0,0), B(1,2), C(3,6), and D(5,10). Connect them with a straight line. Use your graph to find the amount at 4 minutes.



4. Read a rate graph

The graph models ribbon cost at a constant rate. Read B and C. State the price per meter, then write a proportion to find the cost of 5 meters.



5. Scale down

A recipe for 8 servings uses 12 cups of broth. Complete the table for 2 and 6 servings. Write a proportion for 6 servings and explain one scale factor.

Servings	Broth (cups)
8	12
2	
6	

6. Compare rates fairly

Two refill stations charge the amounts in the table. Find each cost per liter. Which station costs less for 10 liters, and by how much?

Station	Liters	Cost (\$)
A	4	6
B	3	6

7. Part to part or part to whole

A mixture uses 2 cups blue paint and 3 cups white paint. A student says blue is $\frac{2}{3}$ of the whole mixture. Correct the claim. Write a proportion and find the blue paint needed for 10 cups of this mixture.

Blue (cups)	White (cups)	Total (cups)
2	3	

Graph point letters identify positions; equivalent equations and proportions are acceptable. Continuous water and ribbon models use connected lines. All rates stay constant.

Task 1

Scale factor 4; $2/5 = 8/x$; $x = 20$ m.

Model (cm)	Actual (m)
2	5
8	20

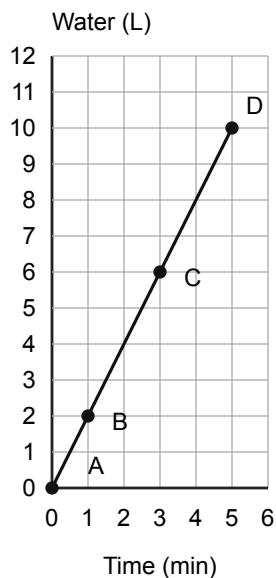
Task 2

White: 6, 9, 12 cups. Multiply both quantities by 2, 3, or 4. Adding 2 gives 4:5, not 2:3.

Blue (cups)	White (cups)
2	3
4	6
6	9
8	12

Task 3

8 liters at 4 minutes; $y = 2x$. The line passes through all four labeled points.

**Task 4**

$B = (2,4)$, $C = (4,8)$. \$2 per meter; $2/4 = 5/c$ gives $c = \$10$.

Task 5

2 servings: 3 cups; 6 servings: 9 cups. $8/12 = 6/x$ gives $x = 9$. Multiply both 8 and 12 by $3/4$. Check that the representation and explanation agree with the given quantities.

Servings	Broth (cups)
8	12
2	3
6	9

Task 6

A: \$1.50/L; B: \$2/L. For 10 L, A costs \$15 and B costs \$20; A costs \$5 less. Check that the representation and explanation agree with the given quantities.

Task 7

The whole is 5 cups, so blue is $2/5$ of the mixture. $b/10 = 2/5$ gives $b = 4$ cups blue (and 6 cups white). $2/3$ compares blue to white, not blue to the whole.

Blue (cups)	White (cups)	Total (cups)
2	3	5