Ratios and Measurement

Lesson 6 Double Number Lines

Standards 6.RP.A.3a

Learning target I can represent a ratio on a double number line.

Materials Counters, tape-diagram space, rulers, measurement conversion chart, graph paper.

Lesson Flow 50 Minutes

0–5 Activate prior knowledge. Read the learning target. Ask students what they already know about double number lines. Use a quick model or estimate to make their starting ideas visible.

5–17 Teach and model. Place zero on both parallel number lines. Align a known pair above and below one tick. Add equal jumps on each line so aligned values remain in the same ratio. Work through the two examples on the attached instruction page. Have students name the first step before showing it.

17–22 Guided practice. Revisit worked Example 2 with its solution covered. Students propose the next step and explain why it is valid; uncover and compare with the worked solution.

22–45 Independent classwork. Assign the attached 10 questions in order. Check items 1–3 for entry-level understanding, 4–6 for connected procedures, 7–8 for representation and explanation, and 9–10 for application or justification. Ask students to use the instruction-page notes area or extra grids for longer work.

45–50 Check understanding. Use classwork question 10 as an exit discussion: Draw aligned number lines for 4 liters of paint covering 7 square meters. Mark 0, one batch, and 7 batches. How much area do 28 liters cover? Compare the result with the answer key and ask a student to defend the method.

Support and Extension

Support Model item 1 together with the listed tools, then have students attempt item 2 independently. Watch the order of ratio labels, part-to-whole denominators, and scaling only one quantity.

Extension Ask students to solve a final item another way, draw a second representation, or create a related problem with a checked answer.

Next step Record which students can explain the target independently. Begin the next teaching session with a brief correction for any recurring error.

Name _____ Date _____

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Learn and Discuss

Place zero on both parallel number lines. Align a known pair above and below one tick. Add equal jumps on each line so aligned values remain in the same ratio.

Example 1 Draw aligned number lines for 6 liters of paint covering 4 square meters. Mark 0, one batch, and 6 batches. How much area do 36 liters cover?
Solution 24 square meters; aligned pairs (0,0), (6,4), (36,24). 36 ÷ 6 = 6 batches; 6 × 4 = 24.
Example 2 Draw aligned number lines for 5 liters of paint covering 5 square meters. Mark 0, one batch, and 5 batches. How much area do 25 liters cover?
Solution 25 square meters; aligned pairs (0,0), (5,5), (25,25). 25 ÷ 5 = 5 batches; 5 × 5 = 25.

Classwork Show Your Work

Complete the 10 problems on the following page. Refer to the examples, draw models, and check your results.

My Notes or Second Method

Lesson 6 Double Number Lines

Name _____ Show calculations, models, and units.

1. Draw aligned number lines for 7 liters of paint covering 7 square meters. Mark 0, one batch, and 3 batches. How much area do 21 liters cover?

2. Draw aligned number lines for 3 liters of paint covering 3 square meters. Mark 0, one batch, and 3 batches. How much area do 9 liters cover?

3. Draw aligned number lines for 2 liters of paint covering 7 square meters. Mark 0, one batch, and 4 batches. How much area do 8 liters cover?

4. Draw aligned number lines for 7 liters of paint covering 2 square meters. Mark 0, one batch, and 3 batches. How much area do 21 liters cover?

5. Draw aligned number lines for 3 liters of paint covering 6 square meters. Mark 0, one batch, and 6 batches. How much area do 18 liters cover?

6. Draw aligned number lines for 6 liters of paint covering 4 square meters. Mark 0, one batch, and 5 batches. How much area do 30 liters cover?

7. Draw aligned number lines for 7 liters of paint covering 7 square meters. Mark 0, one batch, and 4 batches. How much area do 28 liters cover?

8. Draw aligned number lines for 5 liters of paint covering 7 square meters. Mark 0, one batch, and 6 batches. How much area do 30 liters cover?

9. Draw aligned number lines for 3 liters of paint covering 3 square meters. Mark 0, one batch, and 4 batches. How much area do 12 liters cover?

10. Draw aligned number lines for 4 liters of paint covering 7 square meters. Mark 0, one batch, and 7 batches. How much area do 28 liters cover?

Double Number Lines

Ratios and Measurement

1. 21 square meters; aligned pairs (0,0), (7,7), (21,21)
Reasoning 21 ÷ 7 = 3 batches; 3 × 7 = 21.

2. 9 square meters; aligned pairs (0,0), (3,3), (9,9)
Reasoning 9 ÷ 3 = 3 batches; 3 × 3 = 9.

3. 28 square meters; aligned pairs (0,0), (2,7), (8,28)
Reasoning 8 ÷ 2 = 4 batches; 4 × 7 = 28.

4. 6 square meters; aligned pairs (0,0), (7,2), (21,6)
Reasoning 21 ÷ 7 = 3 batches; 3 × 2 = 6.

5. 36 square meters; aligned pairs (0,0), (3,6), (18,36)
Reasoning 18 ÷ 3 = 6 batches; 6 × 6 = 36.

6. 20 square meters; aligned pairs (0,0), (6,4), (30,20)
Reasoning 30 ÷ 6 = 5 batches; 5 × 4 = 20.

7. 28 square meters; aligned pairs (0,0), (7,7), (28,28)
Reasoning 28 ÷ 7 = 4 batches; 4 × 7 = 28.

8. 42 square meters; aligned pairs (0,0), (5,7), (30,42)
Reasoning 30 ÷ 5 = 6 batches; 6 × 7 = 42.

9. 12 square meters; aligned pairs (0,0), (3,3), (12,12)
Reasoning 12 ÷ 3 = 4 batches; 4 × 3 = 12.

10. 49 square meters; aligned pairs (0,0), (4,7), (28,49)
Reasoning 28 ÷ 4 = 7 batches; 7 × 7 = 49.