Fraction Operations and Models

Lesson 5 Fraction Division and Reciprocals

Standards 6.NS.A.1

Learning target I can divide fractions and check using multiplication.

Materials Fraction strips, blank fraction bars, pencils.

Lesson Flow 50 Minutes

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

5–17 Teach and model. If (a/b) ÷ (c/d) = q, then (c/d) × q = a/b. Multiplying by d/c undoes multiplying by c/d, so divide by a nonzero fraction by multiplying by its reciprocal. Simplify the product. 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: Calculate 1/5 ÷ 5/2. Simplify and explain why your answer is reasonable. 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 for taking the reciprocal of the dividend, confusing a partial group with a fraction of the whole, and rounding full-container counts upward.

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

If (a/b) ÷ (c/d) = q, then (c/d) × q = a/b. Multiplying by d/c undoes multiplying by c/d, so divide by a nonzero fraction by multiplying by its reciprocal. Simplify the product.

Example 1 Calculate 1/2 ÷ 1/4. Simplify.
Solution 2. 1/2 ÷ 1/4 = 1/2 × 4 = 2.
Example 2 Calculate 1 ÷ 1. Simplify and explain why your answer is reasonable.
Solution 1. 1 ÷ 1 = 1 × 1 = 1.

Classwork Show Your Work

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

Fraction Model 3/4 ÷ 1/4 = 3 groups



Eight equal pieces show eighths. Every two pieces make 1/4; the shaded 3/4 contains three groups.

Lesson 5 Fraction Division and Reciprocals

Name _____ Show calculations, models, and units.

1. Calculate 3/4 ÷ 1/4. Simplify.

2. Calculate 1/4 ÷ 1/2. Simplify.

3. Calculate 3/4 ÷ 1/2. Simplify.

4. Calculate 6/5 ÷ 2. Simplify.

5. Calculate 2 ÷ 5/4. Simplify.

6. Calculate 5/3 ÷ 1/2. Simplify.

7. Calculate 1 ÷ 1. Simplify and explain why your answer is reasonable.

8. Calculate 1/6 ÷ 1/2. Simplify and explain why your answer is reasonable.

9. Calculate 1/5 ÷ 1/2. Simplify and explain why your answer is reasonable.

10. Calculate 1/5 ÷ 5/2. Simplify and explain why your answer is reasonable.

Fraction Division and Reciprocals

Fraction Operations and Models

1. 3
Reasoning 3/4 ÷ 1/4 = 3/4 × 4 = 3.

2. 1/2
Reasoning 1/4 ÷ 1/2 = 1/4 × 2 = 1/2.

3. 3/2
Reasoning 3/4 ÷ 1/2 = 3/4 × 2 = 3/2.

4. 3/5
Reasoning 6/5 ÷ 2 = 6/5 × 1/2 = 3/5.

5. 8/5
Reasoning 2 ÷ 5/4 = 2 × 4/5 = 8/5.

6. 10/3
Reasoning 5/3 ÷ 1/2 = 5/3 × 2 = 10/3.

7. 1
Reasoning 1 ÷ 1 = 1 × 1 = 1.

8. 1/3
Reasoning 1/6 ÷ 1/2 = 1/6 × 2 = 1/3.

9. 2/5
Reasoning 1/5 ÷ 1/2 = 1/5 × 2 = 2/5.

10. 2/25
Reasoning 1/5 ÷ 5/2 = 1/5 × 2/5 = 2/25.