

Fraction Fix

Student Workbook | Lessons 46-50

Meaning first. Efficient procedures from understanding. Durable fluency through retrieval.

Lesson progression

46 Choosing the Useful Form

47 Fractions as Ratios

48 Unit Rates and Double Number Lines

49 Proportions Without Blind Cross Multiplication

50 Signed Fraction Magnitude

Working habits

Estimate before computing. Name the unit. Connect a representation to the equation. Check reasonableness.

Name: _____

Today's Mathematics Select fraction, decimal, or percent notation strategically.

Essential Question Which representation makes a particular comparison or computation easiest?

Part I | Get Started

1. Write $\frac{5}{8}$ as a decimal and percent.

2. Which form is natural for money: $\frac{3}{4}$ dollar, 0.75 dollar, or 75% of a dollar?

Notice and Predict

3. Choose a form for comparing $\frac{5}{8}$ and 61%.

4. Choose a form for adding $\frac{1}{3}$ and 0.2 exactly.

Sketch, model, or estimate

Part II | Investigate

Solve contexts involving exact comparison, money, probability, and measurement using a chosen form.

Representation workspace | Multiple representations

5. Compare $\frac{5}{8}$ and 61% using your chosen form.

6. Compute \$24 discounted by 25%.

7. Explain why a fraction may preserve exactness better than a rounded decimal.

Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: $\frac{5}{8}=62.5\%$, so $\frac{5}{8}>61\%$. Percent form makes the comparison immediate.

8. Compare $\frac{7}{12}$ and 0.58.

9. Find 12.5% of 48.

10. Write 0.333... exactly as a fraction.

11. Choose a useful form for probability 3 successes in 20 trials.

Error Analysis

12. A student converts $\frac{2}{7}$ to 0.29 and treats it as exact. Explain when rounding changes a comparison.

Exit Ticket

- A. Choose the best form for comparing $\frac{5}{8}$ and 61%.

- B. Complete the comparison and justify your choice.

Today's Mathematics Distinguish part-whole fractions from ratios while connecting both to division.

Essential Question What does each number compare, and what is the referent?

Part I | Get Started

1. For 3 red and 5 blue tiles, name the total.

2. Write the fraction of all tiles that are red.

Notice and Predict

3. Compare red to blue and red to total.

4. Why do $\frac{3}{5}$ and $\frac{3}{8}$ answer different questions?

Sketch, model, or estimate

Part II | Investigate

Represent a mixture with part-part and part-whole comparisons.

Representation workspace | Tape diagrams and ratio tables

Quantity A	Quantity B

5. Draw a tape diagram for 3 red and 5 blue.

6. Write three comparisons with labels.

7. Explain which are part-part and which are part-whole.

Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: red:blue=3:5, red:total=3:8, and blue:total=5:8. The referent changes.

8. For 4 cats and 7 dogs, write cats:dogs.

9. Write the fraction of pets that are dogs.

10. A drink uses 2 cups concentrate and 5 cups water. Interpret $\frac{2}{5}$ and $\frac{2}{7}$.

11. Explain how every ratio connects to division.

Error Analysis

12. A student says 3 red and 5 blue means the red fraction is $\frac{3}{5}$. Identify the missing referent.

Exit Ticket

- A. For 3 red and 5 blue tiles, write and interpret three comparisons.

- B. Label each referent clearly.

Lesson 48 | Unit Rates and Double Number Lines

1 of 3

Today's Mathematics Use division to find a per-one rate and scale it multiplicatively.

Essential Question How does a unit rate organize two changing quantities?

Part I | Get Started

1. Find dollars per item for \$12 for 3 items.

2. Find miles per hour for 6 miles in 2 hours.

Notice and Predict

3. Predict the speed for $2\frac{1}{2}$ miles in $\frac{1}{2}$ hour.

4. Which quantity must be divided by which?

Sketch, model, or estimate

Part II | Investigate

Compare prices and speeds using ratio tables and double number lines.

Representation workspace | Ratio table and double number line



5. Build a table for distance and time.

6. Scale the half-hour pair to one hour.

7. Compare with a second speed of $4\frac{3}{4}$ miles per hour.

Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: $2\frac{1}{2}$ miles divided by $\frac{1}{2}$ hour = 5 miles per hour.

8. Find the price per pound for \$7.50 for $2\frac{1}{2}$ lb.

9. Find cups per batch for $3\frac{3}{4}$ cups in $1\frac{1}{2}$ batches.

10. Compare 6 miles in $\frac{3}{4}$ hour with $7\frac{1}{2}$ mph.

11. Explain why labels are part of the answer.

Error Analysis

12. A student computes $\frac{1}{2}$ divided by $2\frac{1}{2}$ and reports $\frac{1}{5}$ mph. Identify the reversed quantities.

Exit Ticket

- A. Find the unit rate for $2\frac{1}{2}$ miles in $\frac{1}{2}$ hour.

- B. State the units and interpret the value.

Lesson 49 | Proportions Without Blind Cross Multiplication

1 of 3

Today's Mathematics Solve proportional problems through scale factors, unit rates, and equivalence.

Essential Question How can structure solve a proportion before a memorized procedure?

Part I | Get Started

1. Complete $\frac{3}{5} = \frac{\quad}{20}$.

2. Find the scale factor from 10 to 15.

Notice and Predict

3. Solve $x/15 = 6/10$ by scaling.

4. How could a unit-rate strategy reach the same value?

Sketch, model, or estimate

Lesson 49 | Proportions Without Blind Cross Multiplication

2 of 3

Part II | Investigate

Solve one proportional situation by scale factor, unit rate, and equivalent fractions.

Representation workspace | Tables, double number lines, and equations



5. Represent $x/15=6/10$ in a table.

6. Solve using equivalent fractions.

7. Verify the equality with cross-products after reasoning.

Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: 10 to 15 is $\times 1.5$, so 6 to x is also $\times 1.5$; $x=9$.

8. Solve $4/7 = x/35$.

9. Solve $2.5/4 = x/10$.

10. A recipe uses $3/4$ cup for 6 servings. Find the amount for 10 servings.

11. Decide whether $8/12$ and $14/21$ form a proportion.

Error Analysis

12. A student cross-multiplies $3/5 = x/20$ but writes $60 = 5x$ and stops. Connect the equation to the original scale factor.

Exit Ticket

- A. Solve $x/15 = 6/10$.

- B. Explain the scale factor and verify equivalence.

Lesson 50 | Signed Fraction Magnitude

1 of 3

Today's Mathematics Locate, order, and interpret positive and negative fractions.

Essential Question How do direction and distance combine to determine value?

Part I | Get Started

1. Place $-1/2$ and $1/2$ relative to zero.

2. Compare $|-3/4|$ and $|2/3|$.

Notice and Predict

3. Predict the order of $-3/4$, $-2/3$, and $1/5$.

4. Which negative value is farther left?

Sketch, model, or estimate

Lesson 50 | Signed Fraction Magnitude

2 of 3

Part II | Investigate

Place signed fractions on horizontal and vertical number lines and compare value with absolute value.

Representation workspace | Number line



5. Place all three values on the line.

6. Compare $-\frac{5}{6}$ and $-\frac{7}{9}$ using distance from zero.

7. Explain the difference between value and absolute value.

Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: $-\frac{3}{4} < -\frac{2}{3}$ because $\frac{3}{4} > \frac{2}{3}$ in magnitude, so $-\frac{3}{4}$ lies farther left.

8. Order $-\frac{1}{4}$, $-\frac{5}{8}$, 0, and $\frac{3}{10}$.

9. Compare $-\frac{7}{12}$ and $-\frac{3}{5}$.

10. Find the opposite of $-\frac{11}{8}$.

11. Write a signed fraction between $-\frac{1}{2}$ and 0.

Error Analysis

12. A student says $-\frac{7}{8} > -\frac{3}{8}$ because $7 > 3$. Correct the comparison using the number line.

Exit Ticket

- A. Order $-\frac{3}{4}$, $-\frac{2}{3}$, and $\frac{1}{5}$.

- B. Explain how direction affected the order.
