

Fraction Fix

Student Workbook | Lessons 26-30

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

Lesson progression

26 There Is Always Another Fraction

27 Joining Like Units

28 Why Common Denominators

29 Building Efficient Common Denominators

30 Adding Unlike Fractions

Working habits

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

Name: _____

Today's Mathematics Understand density by generating fractions between two given fractions.

Essential Question Why do fractions have no next number?

Part I | Get Started

1. Write $\frac{2}{5}$ and $\frac{3}{5}$ in tenths.

2. Name one number between 0 and $\frac{1}{2}$.

Notice and Predict

3. Is there a fraction immediately after $\frac{2}{5}$?

4. Predict how equivalent forms can create room between points.

Sketch, model, or estimate

Lesson 26 | There Is Always Another Fraction

2 of 3

Part II | Investigate

Use common units and averages to find multiple numbers between $\frac{2}{5}$ and $\frac{3}{5}$.

Representation workspace | Number line and equivalence



5. Rename $\frac{2}{5}$ and $\frac{3}{5}$ in twentieths.

6. Find three fractions strictly between them.

7. Use the average of two fractions to generate another point.

Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: $\frac{2}{5} = \frac{8}{20}$ and $\frac{3}{5} = \frac{12}{20}$, so $\frac{9}{20}$, $\frac{10}{20}$, and $\frac{11}{20}$ lie between.

8. Find two fractions between $\frac{3}{4}$ and $\frac{4}{5}$.

9. Find a fraction between $\frac{7}{8}$ and 1.

10. Find a fraction between $1\frac{1}{3}$ and $1\frac{1}{2}$.

11. Explain why averaging two unequal fractions gives an interior point.

Error Analysis

12. A student says no fraction lies between $\frac{5}{8}$ and $\frac{6}{8}$ because the numerators are consecutive. Correct the model.

Exit Ticket

- A. Find two fractions between $\frac{3}{4}$ and $\frac{4}{5}$.

- B. Explain how equivalence created the intermediate values.

Today's Mathematics Add and subtract fractions with like denominators as counts of a common unit.

Essential Question Why does the unit remain fixed when like fractions are combined?

Part I | Get Started

1. Compute $3\frac{1}{8}$ plus $2\frac{1}{8}$ in words.

2. Place $9\frac{1}{7}$ on a number line.

Notice and Predict

3. Predict $5\frac{1}{8} + 6\frac{1}{8}$ using whole-number benchmarks.

4. What quantity stays constant during the joining?

Sketch, model, or estimate

Part II | Investigate

Model measurement changes and record equations, including results greater than one.

Representation workspace | Number line and strips



5. Model $\frac{5}{8} + \frac{2}{8}$ as a jump on the line.

6. Model $\frac{11}{6} - \frac{5}{6}$.

7. Write a general rule using counts of $\frac{1}{b}$.

Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: $\frac{5}{8} + \frac{2}{8} = \frac{7}{8}$ because five copies plus two copies make seven copies of the same unit, $\frac{1}{8}$.

8. Compute $\frac{7}{12} + \frac{8}{12}$.

9. Compute $\frac{19}{10} - \frac{6}{10}$.

10. Find the missing addend: $\frac{5}{9} + \frac{\quad}{9} = \frac{14}{9}$.

11. A trail is $\frac{17}{8}$ miles; $\frac{5}{8}$ mile remains. How far was completed?

Error Analysis

12. A student writes $\frac{3}{7} + \frac{2}{7} = \frac{5}{14}$. Use unit language to diagnose the error.

Exit Ticket

- A. Explain $\frac{5}{8} + \frac{2}{8}$ in unit-fraction language.

- B. State the sum and a magnitude check.

Today's Mathematics Explain why unlike units must be renamed before addition or subtraction.

Essential Question Why must fractional units match before they can be combined?

Part I | Get Started

1. Write $\frac{1}{2}$ and $\frac{1}{3}$ in sixths.

2. Estimate $\frac{1}{2} + \frac{1}{3}$. Is it below or above 1?

Notice and Predict

3. Why can one half and one third not be counted as two fifths?

4. What common unit can measure both pieces exactly?

Sketch, model, or estimate

Lesson 28 | Why Common Denominators

2 of 3

Part II | Investigate

Attempt to join halves and thirds, then create sixths as a shared unit.

Representation workspace | Fraction strips and number line



5. Represent $\frac{1}{2}$ and $\frac{1}{3}$ on matching strips.

6. Rename both quantities in sixths.

7. Join the common units and connect the model to an equation.

Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: $\frac{1}{2} = \frac{3}{6}$ and $\frac{1}{3} = \frac{2}{6}$; therefore $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$.

8. Compute $\frac{1}{4} + \frac{1}{6}$.

9. Compute $\frac{3}{5} + \frac{1}{2}$.

10. Explain why $\frac{2}{3} - \frac{1}{4}$ needs a common unit.

11. Choose a common denominator for $\frac{5}{8}$ and $\frac{3}{10}$.

Error Analysis

12. A student writes $\frac{1}{2} + \frac{1}{3} = \frac{2}{5}$. Show that the result is unreasonable before finding the correct sum.

Exit Ticket

- A. Explain why $\frac{1}{2} + \frac{1}{3}$ cannot equal $\frac{2}{5}$.

- B. Give the correct sum and identify the common unit.

Today's Mathematics Find useful common denominators using multiples and factor relationships.

Essential Question How can factor structure make renaming more efficient?

Part I | Get Started

1. List the first five multiples of 8.

2. Find the least common multiple of 6 and 9.

Notice and Predict

3. Compare denominator choices for $\frac{1}{6} + \frac{1}{8}$.

4. When does one denominator already contain the other?

Sketch, model, or estimate

Part II | Investigate

Compare product denominators with least common denominators across varied pairs.

Representation workspace | Multiple lists and factor structure

5. Find an efficient common denominator for 12 and 8.
6. Find one for 5 and 20.
7. Explain why 36 is inefficient but valid for denominators 4 and 9.

Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: for 12 and 8, LCM=24. Renaming in twenty-fourths creates smaller numbers than using 96.

8. Choose a denominator for $5/12 + 1/8$.

9. Choose one for $7/10 - 1/15$.

10. Choose one for $3/14 + 5/21$.

11. State when the product of denominators equals the LCM.

Error Analysis

12. A student always multiplies denominators and uses 144 for twelfths and eighteenth parts. Find a more efficient unit.

Exit Ticket

- A. Find and justify an efficient denominator for $5/12 + 1/8$.

- B. Rename both addends without completing the sum.

Today's Mathematics Estimate, rename, add, and simplify fractions with unlike denominators.

Essential Question How does estimate-compute-check protect both meaning and accuracy?

Part I | Get Started

1. Estimate $\frac{2}{3} + \frac{3}{8}$.

2. Find the LCM of 10 and 12.

Notice and Predict

3. Predict whether $\frac{7}{10} + \frac{5}{12}$ is above or below 1.

4. Name an efficient common denominator.

Sketch, model, or estimate

Part II | Investigate

Solve addition problems in a sequence that fades models into symbols.

Representation workspace | Strips to equations

3ths

--	--	--

4ths

--	--	--	--

6ths

--	--	--	--	--	--

5. Model $\frac{1}{3} + \frac{1}{4}$ in twelfths.

6. Compute $\frac{3}{5} + \frac{7}{12}$ and compare with your estimate.

7. Explain when the final result should be simplified.

Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: $7/10 + 5/12 = 42/60 + 25/60 = 67/60 = 1 \frac{7}{60}$; the estimate near 1 confirms the magnitude.

8. Compute $5/6 + 3/10$.

9. Compute $7/8 + 11/12$.

10. Compute $2/9 + 5/6$.

11. A recipe uses $3/4$ cup oats and $2/3$ cup nuts. Find the total.

Error Analysis

12. A student changes $3/5$ to $9/10$ before adding $1/2$. Identify the renaming error and repair the sum.

Exit Ticket

- A. Compute $7/10 + 5/12$.

- B. Verify the answer with an estimate and simplest form.
