

Fraction Fix

Student Workbook | Lessons 21-25

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

Lesson progression

21 **Greatest Common Factor and Simplest Form**

22 **Equivalence Mastery Lab**

23 **Composing and Decomposing**

24 **Improper Fractions and Mixed Numbers**

25 **Comparing Mixed Numbers**

Working habits

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

Name: _____

Lesson 21 | Greatest Common Factor and Simplest Form

1 of 3

Today's Mathematics Use factor structure to simplify efficiently and completely.

Essential Question How does the greatest common factor reveal simplest form?

Part I | Get Started

1. List the factors of 24.

2. Find the greatest common factor of 42 and 70.

Notice and Predict

3. Simplify $48/72$ first by repeated factors, then by the GCF.

4. Which route makes completion easiest to verify?

Sketch, model, or estimate

Part II | Investigate

Compare repeated simplification with one-step GCF simplification.

Representation workspace | Factor lists and prime factors

5. Build factor lists for 36 and 54.
6. Use prime factors to simplify 84/126.
7. Explain how to know the final numerator and denominator are relatively prime.

Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: $\text{GCF}(42, 70) = 14$, so $42/70 = 3/5$; 3 and 5 share no factor greater than 1.

8. Simplify $32/56$.

9. Simplify $63/81$.

10. Is $14/25$ in simplest form?

11. Simplify $144/180$ efficiently.

Error Analysis

12. A student stops at $18/24$ after simplifying $54/72$. What evidence shows the work is unfinished?

Exit Ticket

- A. Simplify $42/70$.

- B. Verify the result using multiplication.

Today's Mathematics Connect equivalence across models, symbols, missing values, and explanations.

Essential Question What evidence proves two fraction names are equivalent?

Part I | Get Started

1. Generate three equivalents for $\frac{2}{5}$.

2. Simplify $\frac{28}{42}$.

Notice and Predict

3. List four ways to prove equivalence.

4. Which proof would best convince someone who distrusts a rule?

Sketch, model, or estimate

Part II | Investigate

Complete stations involving number lines, models, missing values, and error analysis.

Representation workspace | Multiple representations

5. Match $\frac{3}{4}$, $\frac{6}{8}$, $\frac{9}{12}$, and $\frac{12}{16}$ to one point.
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6. Solve $\frac{\quad}{18} = \frac{5}{6}$.
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7. Write an explanation using a factor of one.
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Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: $5/6 \times 3/3 = 15/18$, so the missing numerator is 15.

8. Complete $7/9 = 35/\underline{\quad}$.

9. Simplify $56/98$.

10. Decide whether $12/15 = 16/20$.

11. Create a false equivalent fraction and explain the error.

Error Analysis

12. A student claims $3/5 = 4/6$ because one was added to each part. Use magnitude to disprove the claim.

Exit Ticket

- A. Correct the claim $3/5 = 4/6$.

- B. Give an equivalent fraction for $3/5$ and justify it.

Today's Mathematics Express a fraction as sums of unit fractions and other useful parts.

Essential Question How can one fraction be built in many useful ways?

Part I | Get Started

1. Write $\frac{5}{6}$ as unit-fraction addition.

2. Write $\frac{9}{5}$ as one whole plus a fraction.

Notice and Predict

3. Decompose $\frac{7}{8}$ in four ways.

4. Which decomposition makes distance from 1 most visible?

Sketch, model, or estimate

Part II | Investigate

Find at least four decompositions of $\frac{7}{8}$ and decide which supports mental computation.

Representation workspace | Strips and equations

3ths

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4ths

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6ths

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5. Show $\frac{7}{8}$ as $\frac{1}{2}$ plus another fraction.

6. Show $\frac{11}{6}$ as a whole plus a fraction in two ways.

7. Create a decomposition that contains three addends.

Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: $\frac{7}{8} = \frac{4}{8} + \frac{3}{8} = \frac{1}{2} + \frac{3}{8}$; it is also $1 - \frac{1}{8}$.

8. Decompose $\frac{13}{10}$ around 1.

9. Write $\frac{5}{12}$ as two nonzero fractions.

10. Find two decompositions of $\frac{17}{8}$.

11. Use decomposition to compute $\frac{3}{4} + \frac{7}{8}$ mentally.

Error Analysis

12. A student says $\frac{7}{8}$ has only one decomposition because its numerator is 7. Provide two counterexamples.

Exit Ticket

- A. Write $\frac{11}{6}$ as a whole plus a fraction in two ways.

- B. Explain which form is most useful for locating it.

Lesson 24 | Improper Fractions and Mixed Numbers

1 of 3

Today's Mathematics Translate between forms by reasoning about complete wholes and remaining units.

Essential Question How do complete groups of denominator-sized units create whole numbers?

Part I | Get Started

1. Rename $\frac{9}{4}$ as a whole plus fourths.

2. Write $2\frac{3}{5}$ as an improper fraction.

Notice and Predict

3. How many complete groups of 5 are in 17 fifths?

4. What remains after the complete groups are removed?

Sketch, model, or estimate

Lesson 24 | Improper Fractions and Mixed Numbers

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Part II | Investigate

Bundle repeated fifths into groups of five and record both improper and mixed-number names.

Representation workspace | Number line and strips



5. Place $\frac{17}{5}$ and $3\frac{2}{5}$ on the same line.

6. Rename $\frac{23}{6}$ in both forms.

7. Explain the division equation connected to $\frac{23}{6}$.

Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: $17 \div 6 = 2$ remainder 5, so $17/6 = 2 \frac{5}{6}$ and $17 = 2 \times 6 + 5$.

8. Rename $29/8$.

9. Rename $4 \frac{7}{9}$ as an improper fraction.

10. Place $13/4$ between consecutive wholes.

11. Write 6 as a fraction with denominator 7.

Error Analysis

12. A student renames $17/6$ as $2 \frac{5}{17}$. Diagnose which denominator must remain and why.

Exit Ticket

- A. Rename $17/6$ as a mixed number.

- B. State its whole-number bounds.

Lesson 25 | Comparing Mixed Numbers

1 of 3

Today's Mathematics Compare mixed numbers and improper fractions using magnitude, not conversion by habit.

Essential Question When can whole parts, benchmarks, or distance settle a comparison quickly?

Part I | Get Started

1. Compare $3\frac{1}{4}$ and $2\frac{7}{8}$.

2. Rename $\frac{29}{8}$ as a mixed number.

Notice and Predict

3. Predict whether $3\frac{5}{8}$ or $\frac{29}{8}$ is larger.

4. Which form exposes the comparison most directly?

Sketch, model, or estimate

Lesson 25 | Comparing Mixed Numbers

2 of 3

Part II | Investigate

Choose efficient comparisons for pairs near the same whole number.

Representation workspace | Open number line and benchmarks



5. Place $2\frac{3}{4}$, $1\frac{1}{4}$, and $2\frac{3}{8}$ on the line.

6. Compare $5\frac{1}{6}$ and $3\frac{1}{6}$.

7. Explain a comparison using distance from the next whole.

Conjecture, connection, or revised model

Part III | Make Sense and Practice

WORKED CONNECTION

Example: $3\frac{5}{8} = \frac{29}{8}$, so the two names represent the same point.

8. Compare $4\frac{2}{3}$ and $\frac{23}{5}$.

9. Compare $\frac{17}{6}$ and $2\frac{4}{5}$.

10. Order $3\frac{1}{2}$, $\frac{10}{3}$, and $\frac{15}{4}$.

11. Create an improper fraction greater than $2\frac{7}{8}$ but less than 3.

Error Analysis

12. A student converts $2\frac{11}{12}$ and $\frac{35}{12}$ to decimals and rounds both to 2.9. Explain why this loses needed information.

Exit Ticket

- A. Compare $3\frac{5}{8}$ and $\frac{29}{8}$.

- B. Justify without decimal approximations.
