

Fraction Fix

Teacher Guide | 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

Use each guide page to protect the conceptual throughline, anticipate misconceptions, and collect exit evidence.

Lesson 21 | Greatest Common Factor and Simplest Form

Teacher Guide

Instructional focus

Use factor structure to simplify efficiently and completely.

Primary representation: Factor lists and prime factors

Suggested 50-minute arc

5 min	Cumulative retrieval and estimate
8 min	Launch the central comparison or context
12 min	Student modeling and partner reasoning
10 min	Connect representation, language, and notation
10 min	Focused practice with immediate feedback
5 min	Exit evidence: computation plus explanation

Facilitation notes

- Ask students to estimate or predict before applying a procedure.
- Require the referent whole and the fractional unit to remain explicit.
- Use the listed misconception as evidence about the student's current model.
- Protect the central idea: An equivalent fraction may still not be in simplest form.

Answer key and look-fors

1. Factors: 1,2,3,4,6,8,12,24. 2. GCF is 14.

5. $32/56 = 4/7$. 6. $63/81 = 7/9$.

7. Yes. 8. $144/180 = 4/5$.

Error: 18 and 24 still share 6; the simplest result is $3/4$.

Exit: $42/70 = 3/5$, and $3 \times 14 = 42$, $5 \times 14 = 70$.

MISCONCEPTION TO WATCH

An equivalent fraction may still not be in simplest form.

EVIDENCE TO COLLECT

A correct result, a reasonable magnitude check, and an explanation that connects the representation to the symbols.

Instructional focus

Connect equivalence across models, symbols, missing values, and explanations.

Primary representation: Multiple representations

Suggested 50-minute arc

5 min	Cumulative retrieval and estimate
8 min	Launch the central comparison or context
12 min	Student modeling and partner reasoning
10 min	Connect representation, language, and notation
10 min	Focused practice with immediate feedback
5 min	Exit evidence: computation plus explanation

Facilitation notes

- Ask students to estimate or predict before applying a procedure.
- Require the referent whole and the fractional unit to remain explicit.
- Use the listed misconception as evidence about the student's current model.
- Protect the central idea: Adding the same number to numerator and denominator does not preserve value.

Answer key and look-fors

1. Examples: $4/10$, $6/15$, $8/20$. 2. $28/42 = 2/3$.
 5. $7/9 = 35/45$. 6. $56/98 = 4/7$.
 7. Yes; both equal $4/5$. 8. Answers vary with a valid diagnosis.
- Error: $3/5=0.6$ while $4/6=2/3$; additive changes do not preserve ratio.
- Exit: $3/5$ is not $4/6$; examples include $6/10$ using factor $2/2$.

MISCONCEPTION TO WATCH

Adding the same number to numerator and denominator does not preserve value.

EVIDENCE TO COLLECT

A correct result, a reasonable magnitude check, and an explanation that connects the representation to the symbols.

Instructional focus

Express a fraction as sums of unit fractions and other useful parts.

Primary representation: Strips and equations

Suggested 50-minute arc

5 min	Cumulative retrieval and estimate
8 min	Launch the central comparison or context
12 min	Student modeling and partner reasoning
10 min	Connect representation, language, and notation
10 min	Focused practice with immediate feedback
5 min	Exit evidence: computation plus explanation

Facilitation notes

- Ask students to estimate or predict before applying a procedure.
- Require the referent whole and the fractional unit to remain explicit.
- Use the listed misconception as evidence about the student's current model.
- Protect the central idea: A fraction has many valid decompositions.

Answer key and look-fors

1. Five copies of $\frac{1}{6}$. 2. $\frac{9}{5} = 1 + \frac{4}{5}$.
 5. $\frac{13}{10} = 1 + \frac{3}{10}$. 6. Answers include $\frac{1}{12} + \frac{4}{12}$.
 7. Examples: $2 + \frac{1}{8}$ and $1 + \frac{9}{8}$. 8. $\frac{3}{4} + \frac{7}{8} = \frac{6}{8} + \frac{7}{8} = \frac{13}{8}$.
 Error: examples include $\frac{1}{2} + \frac{3}{8}$ and $\frac{3}{4} + \frac{1}{8}$.
 Exit: $\frac{11}{6} = 1 + \frac{5}{6} = \frac{6}{6} + \frac{5}{6}$.

MISCONCEPTION TO WATCH

A fraction has many valid decompositions.

EVIDENCE TO COLLECT

A correct result, a reasonable magnitude check, and an explanation that connects the representation to the symbols.

Instructional focus

Translate between forms by reasoning about complete wholes and remaining units.

Primary representation: Number line and strips

Suggested 50-minute arc

5 min	Cumulative retrieval and estimate
8 min	Launch the central comparison or context
12 min	Student modeling and partner reasoning
10 min	Connect representation, language, and notation
10 min	Focused practice with immediate feedback
5 min	Exit evidence: computation plus explanation

Facilitation notes

- Ask students to estimate or predict before applying a procedure.
- Require the referent whole and the fractional unit to remain explicit.
- Use the listed misconception as evidence about the student's current model.
- Protect the central idea: The remainder becomes the numerator over the original denominator.

Answer key and look-fors

1. $9/4 = 2 \frac{1}{4}$. 2. $2 \frac{3}{5} = 13/5$.

5. $29/8 = 3 \frac{5}{8}$. 6. $4 \frac{7}{9} = 43/9$.

7. $13/4$ lies between 3 and 4. 8. $6 = 42/7$.

Error: the unit remains sixths, so $17/6 = 2 \frac{5}{6}$.

Exit: $17/6 = 2 \frac{5}{6}$, between 2 and 3.

MISCONCEPTION TO WATCH

The remainder becomes the numerator over the original denominator.

EVIDENCE TO COLLECT

A correct result, a reasonable magnitude check, and an explanation that connects the representation to the symbols.

Lesson 25 | Comparing Mixed Numbers

Teacher Guide

Instructional focus

Compare mixed numbers and improper fractions using magnitude, not conversion by habit.

Primary representation: Open number line and benchmarks

Suggested 50-minute arc

5 min	Cumulative retrieval and estimate
8 min	Launch the central comparison or context
12 min	Student modeling and partner reasoning
10 min	Connect representation, language, and notation
10 min	Focused practice with immediate feedback
5 min	Exit evidence: computation plus explanation

Facilitation notes

- Ask students to estimate or predict before applying a procedure.
- Require the referent whole and the fractional unit to remain explicit.
- Use the listed misconception as evidence about the student's current model.
- Protect the central idea: Converting every number can create unnecessary work.

Answer key and look-fors

1. $3\frac{1}{4} > 2\frac{7}{8}$. 2. $\frac{29}{8} = 3\frac{5}{8}$.

5. $4\frac{2}{3} > \frac{23}{5}$. 6. $\frac{17}{6} > 2\frac{4}{5}$.

7. $\frac{10}{3} < 3\frac{1}{2} < \frac{15}{4}$. 8. Answers include $\frac{23}{8}$.

Error: rounding hides exact differences; use common units or exact forms.

Exit: the values are equal because $3 \times 8 + 5 = 29$.

MISCONCEPTION TO WATCH

Converting every number can create unnecessary work.

EVIDENCE TO COLLECT

A correct result, a reasonable magnitude check, and an explanation that connects the representation to the symbols.