

Fraction Fix

Teacher Guide | Lessons 16-20

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

Lesson progression

16 Benchmark Comparisons

17 Flexible Comparison Strategies

18 Equivalent Points

19 Splitting Every Part

20 Grouping Parts

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

Lesson 16 | Benchmark Comparisons

Teacher Guide

Instructional focus

Compare fractions to 0, $\frac{1}{2}$, 1, and nearby whole numbers.

Primary representation: Benchmark number line

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 benchmark argument can be more efficient than finding common denominators.

Answer key and look-fors

1. $\frac{5}{12} < \frac{1}{2} < \frac{7}{12}$; 2. $\frac{11}{10} > 1$.

Launch: $\frac{7}{15} < \frac{1}{2} < \frac{8}{15} < \frac{3}{4} < \frac{14}{15}$.

8. $\frac{4}{9} < \frac{5}{8} < \frac{7}{9}$. 9. $\frac{11}{12} > \frac{6}{7}$ because it is closer to 1.

10. $\frac{15}{8}$ is $\frac{1}{8}$ from 2; $\frac{11}{6}$ is $\frac{1}{6}$ from 2, so $\frac{15}{8}$ is closer.

Exit: $\frac{7}{15} < \frac{8}{15} < \frac{3}{4}$.

MISCONCEPTION TO WATCH

A benchmark argument can be more efficient than finding common denominators.

EVIDENCE TO COLLECT

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

Lesson 17 | Flexible Comparison Strategies

Teacher Guide

Instructional focus

Select and justify an efficient strategy for any fraction pair.

Primary representation: Number lines, benchmarks, equivalence

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: Cross-products can hide magnitude and are unnecessary for many pairs.

Answer key and look-fors

1. $9/13 < 12/13$. 2. $5/8 > 5/12$.
5. $3/4 > 11/16$. 6. $8/9 = 1 - 1/9$ and $11/12 = 1 - 1/12$, so $11/12$ is greater.
7. $13/8 > 8/5$ because $13/8 = 1 \frac{5}{8}$ and $8/5 = 1 \frac{3}{5}$.
8. $7/10 < 5/7$. 9. $17/18 > 14/15$. 10. $9/8 < 7/6$.
- Exit: $7/12 = 14/24$ and $5/8 = 15/24$, so $7/12 < 5/8$; both are above $1/2$.

MISCONCEPTION TO WATCH

Cross-products can hide magnitude and are unnecessary for many pairs.

EVIDENCE TO COLLECT

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

Instructional focus

Recognize equivalent fractions as the same point and the same magnitude.

Primary representation: Fraction strips and stacked number lines

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: Equivalent fractions are exactly equal, not merely close.

Answer key and look-fors

1. Examples: $\frac{2}{4}$, $\frac{3}{6}$. 2. The points coincide.

5. $\frac{2}{3} = \frac{8}{12}$. 6. $\frac{5}{6} = \frac{10}{12}$.

7. Examples: $\frac{2}{1}$, $\frac{4}{2}$, $\frac{6}{3}$. 8. $\frac{7}{5} = \frac{28}{20}$.

Error: fraction names differ, but splitting each part preserves total length.

Exit: $\frac{3}{4}$ and $\frac{6}{8}$ are the same point; each fourth is two eighths.

MISCONCEPTION TO WATCH

Equivalent fractions are exactly equal, not merely close.

EVIDENCE TO COLLECT

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

Lesson 19 | Splitting Every Part

Teacher Guide

Instructional focus

Explain why multiplying numerator and denominator by the same number preserves value.

Primary representation: Area and length models

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 number and size of parts change together.

Answer key and look-fors

1. $1/2 = 4/8$. 2. Factor 4.

5. $5/7 = 20/28$. 6. $9/12 = 3/4$.

7. $11/6 = 55/30$. 8. Yes; both numbers were multiplied by 4.

Error: numerator and denominator must be scaled by the same nonzero factor.

Exit: $20/28$; multiplying by $4/4$ preserves value.

MISCONCEPTION TO WATCH

The number and size of parts change together.

EVIDENCE TO COLLECT

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

Instructional focus

Explain simplification as renaming with larger unit fractions.

Primary representation: Grids, strips, and factor structure

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: Simplifying changes the name, not the size of the number.

Answer key and look-fors

1. Common factors include 2, 3, and 6. 2. $6/9 = 12/18$.

5. $18/24 = 3/4$. 6. $21/35 = 3/5$.

7. $45/60 = 3/4$. 8. Both simplify to $2/3$.

Error: grouping parts changes the unit name while preserving the point.

Exit: divide by 6; $18/24 = 3/4$.

MISCONCEPTION TO WATCH

Simplifying changes the name, not the size of the number.

EVIDENCE TO COLLECT

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