

Fraction Fix

Teacher Guide | Lessons 51-54

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

Lesson progression

51 Operations With Signed Fractions

52 Fractions in Equations

53 Complex Fractions, Slope, and Formulas

54 Fraction Fluency Performance Task

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

Lesson 51 | Operations With Signed Fractions

Teacher Guide

Instructional focus

Extend rational-number operations using properties and number-line meaning.

Primary representation: Number line 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: Sign rules do not replace fraction operation rules.

Answer key and look-fors

1. Negative. 2. 12.

5. $-9/20$. 6. $19/18=1\frac{1}{18}$.

7. $-2/3$. 8. $-7/2$.

Error: rewrite as addition of a negative; the result is $-7/6$.

Exit: $-1/12$ because $5/6$ has greater magnitude.

MISCONCEPTION TO WATCH

Sign rules do not replace fraction operation rules.

EVIDENCE TO COLLECT

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

Instructional focus

Solve equations containing fractional coefficients and constants with structural reasoning.

Primary representation: Balance model 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: Clearing denominators requires multiplying every term in the equation.

Answer key and look-fors

1. $x=15$. 2. $LCD=8$.

5. $x=15/8$. 6. $x=3$.

7. $x=2$. 8. It converts all rational coefficients to integers.

Error: multiplying one side by a value requires multiplying every term on both sides.

Exit: $x=3/2$; substitution gives $9/8-4/8=5/8$.

MISCONCEPTION TO WATCH

Clearing denominators requires multiplying every term in the equation.

EVIDENCE TO COLLECT

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

Instructional focus

Apply fraction fluency in algebraic expressions and rates of change.

Primary representation: Coordinate plane 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: Fraction bars can represent grouping at multiple levels.

Answer key and look-fors

1. $\frac{2}{3}$. 2. $(y_2 - y_1)/(x_2 - x_1)$.
 5. $\frac{2}{3}$. 6. Slope = -1.
 7. $15/8 = 1 \frac{7}{8}$. 8. Each bar groups an entire numerator or denominator.
- Error: slope is vertical change divided by horizontal change.
- Exit: answers vary; require simplified rise/run and a reasonable sign.

MISCONCEPTION TO WATCH

Fraction bars can represent grouping at multiple levels.

EVIDENCE TO COLLECT

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

Lesson 54 | Fraction Fluency Performance Task

Teacher Guide

Instructional focus

Demonstrate durable understanding across magnitude, representation, computation, and transfer.

Primary representation: Student-selected 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.
- Score the four dimensions separately. A student is secure only when no dimension is missing and later evidence remains accessible.

Answer key and look-fors

1. $7/6$ just above 1; $5/8$ above $1/2$. 2. Answers vary with valid scaling.

5. $5/6 + 7/10 = 23/15 = 1 \frac{8}{15}$. 6. $3/4 \times 8/3 = 2$.

7. $x = 3/2$. 8. $7/16 = 0.4375 = 43.75\%$.

Error: common denominator 20 gives $12/20 + 5/20 = 17/20$; sum must exceed $3/5$.

Exit: evaluate all four dimensions; computation alone is insufficient.

MISCONCEPTION TO WATCH

A high computation score alone does not demonstrate complete fluency.

EVIDENCE TO COLLECT

A balanced performance profile across accuracy, magnitude, representation, and transfer, plus a specific next step based on the rubric.