

Fraction Fix

Student Workbook · Lessons 11–15

Locate the number. Compare the magnitude. Explain the reasoning.

How this block works You will use number lines and benchmarks to locate and compare fractions. Estimate before partitioning, and explain why each point or comparison is reasonable.

Three habits

Habit	What that sounds like
Establish the scale	I know where 0, 1, and nearby wholes are.
Estimate first	The point should be a little greater than one-half.
Check the unit	Each interval has length one fifth, and the intervals are equal.

This workbook belongs to:

Lesson 11 | Locating Proper Fractions

Name: _____

Date: _____

Today's Math Locate proper fractions by iterating unit lengths from zero.

Essential Question How does the unit fraction determine a point on the number line?

Retrieval Warm-Up

1. Draw a number line from 0 to 1 with five equal intervals. Label $\frac{3}{5}$.



2. Why must the spaces—not the tick marks—be counted when determining the denominator?

Part I | Notice and Predict

3. Without partitioning exactly, estimate where $\frac{2}{3}$ belongs on the line. Mark a reasonable point with an X.



4. Explain why your estimate must be greater than $\frac{1}{2}$ but less than 1.

Lesson 11 continued | Partition From Zero

Part II | Build the Idea

5. Place $\frac{1}{2}$, $\frac{2}{3}$, and $\frac{3}{4}$ on the stacked number lines. Use the same 0-to-1 scale on every line.



6. Which point is closest to 1? Use distance from 1 to justify.

7. Place $\frac{5}{8}$ on the line. Label the length of one interval.



8. Describe the two actions that locate $\frac{a}{b}$ on a 0-to-1 line.

Lesson 11 continued | Check Your Understanding

Part III | Practice and Explain

9. On one 0-to-1 line, locate $\frac{1}{4}$, $\frac{3}{8}$, and $\frac{5}{6}$. Estimate each location before partitioning.



10. A student counts 0 as the first tick and places $\frac{2}{5}$ at the second tick on a line divided into fifths. Diagnose the error and state the correct location.

11. Is $\frac{4}{7}$ closer to $\frac{1}{2}$ or to 1? Explain without using decimals.

Quick Write | 5 minutes

Explain why the denominator controls interval length while the numerator controls the number of intervals traveled from zero.

Exit Ticket

A. Place $\frac{2}{3}$ on an unpartitioned 0-to-1 line.

B. Justify the point using the unit fraction and a benchmark.

Lesson 12 | Locating Improper Fractions

Name: _____

Date: _____

Today's Math Extend one consistent fractional unit beyond one whole.

Essential Question How can a number line continue past one without changing the unit?

Retrieval Warm-Up

1. How many fourths make one whole? Write 1 and 2 as fractions with denominator 4.

2. Between which two whole numbers does $\frac{7}{4}$ lie? Explain.

Part I | Notice and Predict

3. Count by fourths from 0 through $1\frac{1}{4}$. Label every tick.



4. What remains unchanged as the line passes 1 and 2?

Part II | Build the Idea

5. Locate $\frac{5}{4}$, $\frac{7}{4}$, and $1\frac{1}{4}$ on the line above. Then circle the point farthest from 2.

Lesson 12 continued | Complete Wholes and Remaining Units

6. Partition the 0-to-3 line into thirds. Locate $\frac{5}{3}$ and $\frac{8}{3}$.



7. Complete each decomposition.

Fraction	Complete wholes	Whole-number bounds
$\frac{5}{3}$	$\frac{3}{3} + \frac{\quad}{3}$	$\frac{\quad}{3}$ and $\frac{\quad}{3}$
$\frac{8}{3}$	$\frac{\quad}{3} + \frac{\quad}{3} + \frac{\quad}{3}$	$\frac{\quad}{3}$ and $\frac{\quad}{3}$
$\frac{13}{5}$	$\frac{\quad}{5} + \frac{\quad}{5} + \frac{\quad}{5}$	$\frac{\quad}{5}$ and $\frac{\quad}{5}$
$\frac{10}{4}$	$\frac{\quad}{4} + \frac{\quad}{4} + \frac{\quad}{4}$	$\frac{\quad}{4}$ and $\frac{\quad}{4}$

8. How does the numerator help you determine the number of complete wholes?

9. Locate $\frac{13}{5}$ without labeling every fifth. Describe the benchmarks you used.



Lesson 12 continued | Reason and Prove

Part III | Diagnose the Claim

10. A student places $\frac{7}{3}$ between 0 and 1 because every fraction must be less than one. Correct the claim with a number-line argument.

11. Create a fraction with denominator 6 that lies between 2 and 3. Show two different ways to prove its location.

Work space

12. Which is farther from 2: $\frac{7}{4}$ or $\frac{10}{4}$? Explain using distance in fourths.

Quick Write | 5 minutes

Why does the denominator stay the same when a fraction crosses a whole-number boundary?

Exit Ticket

A. Locate $\frac{8}{3}$ and give its whole-number bounds.

B. Write $\frac{8}{3}$ as complete wholes plus remaining thirds.

Lesson 13 | Fraction Number Line Estimation

Name: _____

Date: _____

Today's Math Estimate fraction locations using benchmarks instead of drawing every partition.

Essential Question How can benchmarks locate a fraction efficiently?

Retrieval Warm-Up

1. Between which two whole numbers does $13/8$ lie?

2. Name one fraction equal to $1/2$ and one fraction equal to 2.

Part I | Build the Benchmarks

3. Label 0, $1/2$, 1, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, and 3 on the open line.



4. Estimate the locations of $7/8$, $5/4$, and $13/8$. Write each label beside its point.



5. For each fraction, name the benchmark that influenced your placement most.

Lesson 13 continued | Estimate Before You Partition

Part II | Sort and Place

6. Sort each fraction into a benchmark interval before placing it: $\frac{1}{10}$, $\frac{4}{9}$, $\frac{7}{10}$, $\frac{9}{8}$, $\frac{7}{4}$, $\frac{15}{8}$, $\frac{11}{5}$, $\frac{17}{6}$.

0 to $\frac{1}{2}$	$\frac{1}{2}$ to 1	1 to $1\frac{1}{2}$	$1\frac{1}{2}$ to 2	2 to $2\frac{1}{2}$	$2\frac{1}{2}$ to 3

7. Place the fractions on the open 0-to-3 line. Exact partitions are not required; relative order is.



8. Choose two neighboring points. Explain why one must be to the left of the other.

9. Which fraction was hardest to place? State the estimate you used before refining it.

Lesson 13 continued | Check Reasonableness

Part III | Diagnose and Refine

10. A student places $\frac{13}{8}$ to the right of 2 because 13 is greater than 8. Identify two benchmarks that disprove the placement.

11. Give a reasonable interval of width $\frac{1}{4}$ that contains $\frac{17}{10}$. Explain how you know.

12. Estimate where $\frac{23}{12}$ lies. Then use the numerator-denominator relationship to decide whether it is closer to 1 or 2.

Quick Write | 5 minutes

When is estimation more efficient than drawing every equal interval on a number line?

Exit Ticket

A. Estimate the location of $\frac{13}{8}$ on a 0-to-3 number line.

B. Explain why the point is reasonable using two benchmarks.

Lesson 14 | Same Denominator Comparisons

Name: _____

Date: _____

Today's Math Compare fractions built from the same-sized unit.

Essential Question What stays constant when denominators match?

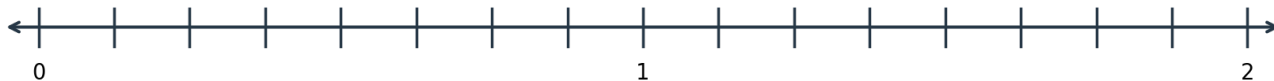
Retrieval Warm-Up

1. Estimate the locations of $\frac{5}{8}$ and $\frac{11}{8}$. Which whole-number interval contains each?

2. Name the unit fraction in $\frac{7}{10}$ and in $\frac{13}{10}$.

Part I | Notice and Generalize

3. Place $\frac{3}{8}$, $\frac{7}{8}$, and $\frac{11}{8}$ on the same line.



4. What stays constant? What changes? Use the words unit and copies.

5. Complete the generalization: If the denominators and wholes are the same, the fraction with the _____ numerator is greater because it contains _____ copies of the same unit.

Lesson 14 continued | Compare Counts of the Same Unit

Part II | Practice and Explain

6. Write $<$, $>$, or $=$. Then justify each with unit-fraction language.

Comparison	Why
$5/12$ ____ $9/12$	
$14/9$ ____ $11/9$	
$7/5$ ____ $5/5$	
$18/20$ ____ $19/20$	

7. Order from least to greatest: $13/7$, $6/7$, $15/7$, $7/7$. State how the order would appear on a number line.

8. Three measurements are $5/16$ m, $12/16$ m, and $9/16$ m. Which is longest? How much longer is it than the shortest?

9. Write two fractions with denominator 11 such that one is greater than 1 and one is less than 1. Compare them.

Lesson 14 continued | Use the Shortcut Only When It Fits

Part III | Diagnose the Condition

10. A student says, “The larger numerator always makes the larger fraction.” Give one example where the claim works and one counterexample where it fails.

Examples and explanation

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11. Compare $\frac{11}{8}$ and $\frac{7}{8}$ with a one-sentence justification that names the unit.

12. Create two same-denominator fractions whose difference is $\frac{5}{12}$. Explain how you know.

Quick Write | 5 minutes

Why is comparing numerators a mathematical argument only after the denominators and referent wholes have been checked?

Exit Ticket

A. Compare $\frac{11}{8}$ and $\frac{7}{8}$.

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B. Write the comparison in unit-fraction language.

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Lesson 15 | Same Numerator Comparisons

Name: _____	Date: _____
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Today's Math Compare equal counts of differently sized unit fractions.

Essential Question What changes when the numerator stays constant but the unit size changes?

Retrieval Warm-Up

1. Write $<$, $>$, or $=$: $\frac{7}{9}$ ____ $\frac{4}{9}$. Explain the comparison.

2. For the same whole, which unit is larger: $\frac{1}{6}$ or $\frac{1}{9}$?

Part I | Notice and Predict

3. Without cross-products, predict which is greater: $\frac{3}{5}$ or $\frac{3}{8}$. Explain what the numerator holds constant.

4. Use the same-length bars to represent $\frac{3}{5}$ and $\frac{3}{8}$. Shade three equal parts in each.

Bar A | Fifths

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Bar B | Eighths

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5. Complete the generalization: When numerators match, the fraction with the _____ denominator is greater because its unit fraction is _____.

Lesson 15 continued | Equal Counts of Different Units

Part II | Practice and Explain

6. Write $<$, $>$, or $=$. Explain each comparison using unit size, not cross-products.

Comparison	Unit-size explanation
$\frac{5}{6}$ ____ $\frac{5}{9}$	
$\frac{7}{12}$ ____ $\frac{7}{10}$	
$\frac{4}{5}$ ____ $\frac{4}{7}$	
$\frac{11}{8}$ ____ $\frac{11}{12}$	

7. Order from least to greatest: $\frac{6}{11}$, $\frac{6}{7}$, $\frac{6}{13}$, $\frac{6}{8}$. Describe the denominator pattern.

8. Two ribbons are cut from equal-length wholes. One piece is $\frac{5}{12}$ of a whole and the other is $\frac{5}{8}$. Which is longer? Explain.

9. Why is the phrase “same whole” still necessary when using the same-numerator strategy?

Lesson 15 continued | Choose a Valid Strategy

Part III | Diagnose and Transfer

10. A student says $5/9 > 5/6$ because $9 > 6$. Correct the reasoning in words and with a simple sketch.

Sketch and explanation

11. Compare $5/6$ and $5/9$ without cross-products. Then state how far each fraction is from 1.

12. Create two fractions with the same numerator for which the fraction with denominator 10 is greater. Explain your choices.

Quick Write | 5 minutes

Explain how equal numerators turn a fraction comparison into a comparison of unit-fraction sizes.

Exit Ticket

A. Compare $5/6$ and $5/9$.

B. Explain why the denominator reverses the whole-number instinct in this special case.