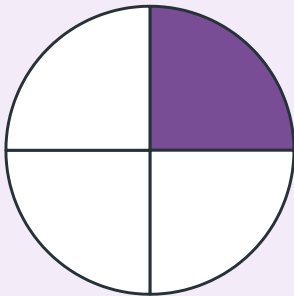
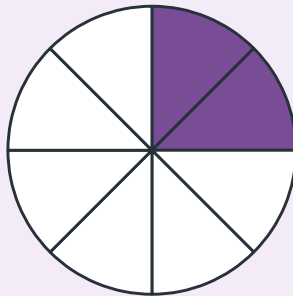
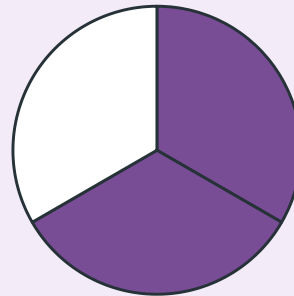


Unit First: Fraction Intervention Toolkit

6 complete activities from Fraction Intervention Toolkit, each with a worked answer.

 $\frac{1}{4}$  $\frac{2}{8}$  $\frac{2}{3}$

FOR THE TEACHER

1. Choose the page that matches the skill you are working on.
2. Let students work, then listen to how they explain it.
3. Use the answer key's "Watch for" note to plan your next question.
4. Use the Try It task to check that the idea transfers.

6 activities • 3 answer pages • From the 48-activity collection

10 US Letter pages • Print at 100% / Actual Size

Original Bobotemp educational printable • Fictional names, places and prices

Name _____ Date _____

LEVEL 1



Look at each rectangle. Use both clues to find the one that shows fourths.

Four rectangles are the same size. Rectangle A is cut into 4 strips: two wide strips and two thin strips. Rectangle B is cut into 3 equal strips. Rectangle C is cut into 4 equal squares. Rectangle D is cut into 6 equal strips. Only one rectangle shows fourths. A fourth is one of 4 equal parts of the whole. Which rectangle shows fourths?

FOUR SAME-SIZE RECTANGLES



Rectangle A

Rectangle B

Rectangle C

Rectangle D

EVIDENCE TO USE

- Whole: one rectangle
- Fourths need exactly 4 parts
- All 4 parts must be the same size
- Clue 1: exactly 4 parts
- Clue 2: all parts are equal

1. Cross out rectangles that do not have exactly 4 parts.

2. Cross out rectangles with parts of different sizes.

[illegible]

3. Finish: Rectangle ___ shows fourths because ___.

TRY IT • A square is cut into 3 parts. One part is half of the square, and the other two parts are each a quarter of the square. Does the square show thirds? Explain.

Name _____ Date _____

LEVEL 1



Use unit pieces to build a fraction. Count copies of the unit.

The whole is one paper strip. Maya has a stack of unit pieces, and each piece is $\frac{1}{8}$ of the strip. She wants to build a length of $\frac{7}{8}$ by laying pieces end to end. She has already laid down 3 pieces. How many more $\frac{1}{8}$ pieces does she need?

THE WHOLE STRIP, IN EIGHTHS

strip	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
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EVIDENCE TO USE

- Whole: 1 paper strip
- Unit piece: $\frac{1}{8}$ of the strip
- Goal: $\frac{7}{8} = 7$ copies of $\frac{1}{8}$
- Already placed: 3 pieces, or $\frac{3}{8}$

1. Shade 3 eighths on the strip, then keep shading until you reach 7 eighths.

[illegible]

2. Write $\frac{7}{8}$ as a sum of $\frac{1}{8}$ pieces.

A blank sheet of graph paper with a light gray grid pattern on a white background. The grid consists of 10 columns and 10 rows of squares. The paper has rounded corners and a thin gray border.

3. How many more pieces does Maya need?

TRY IT • How many $\frac{1}{6}$ pieces make $\frac{5}{6}$? If 2 pieces are already placed, how many more are needed?

Name _____ Date _____

LEVEL 2



Use all three clues to find the mystery fraction. All fractions are of the same whole strip.

Find the mystery fraction. Candidates: $\frac{3}{8}$, $\frac{3}{5}$, $\frac{5}{8}$, $\frac{3}{4}$. Clue 1: It is made of exactly 3 copies of a unit fraction. Clue 2: It is greater than $\frac{1}{2}$. Clue 3: Its unit fraction is smaller than $\frac{1}{4}$.

EVIDENCE TO USE

- Same whole: one strip
- Candidates: $\frac{3}{8}$, $\frac{3}{5}$, $\frac{5}{8}$, $\frac{3}{4}$
- More equal parts make smaller units
- $\frac{1}{2} = \frac{4}{8}$

1. Test each candidate against each clue. Cross out any that fail.

[illegible]

2. Order the units $\frac{1}{8}$, $\frac{1}{4}$, and $\frac{1}{5}$ from largest to smallest.

A blank sheet of graph paper with a grid pattern. The grid consists of 10 columns and 10 rows of squares. The paper has rounded corners and a light gray border.

3. Explain why $\frac{3}{5} > \frac{3}{8}$ using unit size.

[illegible]

TRY IT • Compare $\frac{2}{3}$ and $\frac{2}{8}$ of the same strip. Then compare $\frac{3}{6}$ and $\frac{5}{6}$. Use $>$, $<$, or $=$.

Name _____ Date _____

LEVEL 2



A classmate sorted fraction cards. Find the card in the wrong bin.

Priya sorted five cards, all fractions of the same whole, into three bins. Bin 'less than $\frac{1}{2}$ ': $\frac{3}{8}$, $\frac{1}{3}$, $\frac{7}{10}$. Bin 'equal to $\frac{1}{2}$ ': $\frac{4}{8}$. Bin 'between $\frac{1}{2}$ and 1': $\frac{5}{6}$. Exactly one card is misplaced. Clue 1: The card is in the 'less than $\frac{1}{2}$ ' bin. Clue 2: The card's numerator is more than half its denominator. Find the misplaced card.

PRIYA'S BINS

less than $\frac{1}{2}$	equal to $\frac{1}{2}$	between $\frac{1}{2}$ and 1
$\frac{3}{8}$	$\frac{4}{8}$	$\frac{5}{6}$
$\frac{1}{3}$		
$\frac{7}{10}$		

EVIDENCE TO USE

- Benchmarks: 0, $\frac{1}{2}$, 1
- Example: half of 8 eighths is 4 eighths, and $3 < 4$, so $\frac{3}{8}$ is less than $\frac{1}{2}$
- A card is greater than $\frac{1}{2}$ when its numerator is more than half its denominator
- All five cards are fractions of the same whole
- Exactly one card is in the wrong bin

1. For each card, write what half of its denominator is.

2. Find the misplaced card and move it to the correct bin.

[illegible]

3. Write a 'because' sentence for the card you moved.

TRY IT • Sort $\frac{2}{6}$, $\frac{5}{8}$, $\frac{6}{12}$, and $\frac{9}{10}$ into the three bins.

Name _____ Date _____

LEVEL 3



Group unit fractions into wholes on a number line.

A walking track is marked in thirds of a mile. Jaylen walks 11 sections, and each section is $\frac{1}{3}$ mile, so he walks $\frac{11}{3}$ miles. Draw a number line from 0 to 4 marked in thirds. Group every 3 thirds into one whole mile. Write $\frac{11}{3}$ as a mixed number. How many thirds are left over after you make the whole miles?

EVIDENCE TO USE

- Whole: 1 mile
- Unit: $\frac{1}{3}$ mile
- 3 thirds = 1 whole
- Distance: $11\frac{1}{3}$ miles

1. Circle groups of 3 thirds on your number line.

[illegible]

2. How many whole miles are there? How many thirds are left over?

[illegible]

3. Write $11/3$ as a mixed number. Convert $7/4$ and $9/8$ the same way.

[illegible]

TRY IT • Write $13/6$ as a mixed number. Use a number line to show your grouping.

Name _____ Date _____

LEVEL 3



Subtract a fraction from a mixed number in two ways, then check your answer.

A nature trail is $2\frac{1}{4}$ miles long. Rosa has walked $\frac{3}{4}$ mile. How much farther must she walk? Show two ways. (a) Rename $2\frac{1}{4}$ as fourths and subtract. (b) Jump back on a number line marked in fourths. Then check your answer by adding.

NUMBER LINE IN FOURTHS



EVIDENCE TO USE

- Whole: 1 mile
- Trail: $2 \frac{1}{4}$ miles
- Walked: $\frac{3}{4}$ mile
- $2 \frac{1}{4} = \frac{9}{4}$

1. Rename $2\frac{1}{4}$ in fourths and subtract $\frac{3}{4}$.

2. Show 3 jumps of $\frac{1}{4}$ back from $2\frac{1}{4}$ on a number line.

A blank sheet of graph paper with a grid pattern. The grid consists of 10 columns and 10 rows of squares. The paper has rounded corners and a light gray border.

3. Check your answer by adding $\frac{3}{4}$ to it.

TRY IT • A rope is $1\frac{3}{4}$ yards long. Add $\frac{2}{4}$ yard. How long is the rope now?

1. Fair or Not Fair?

LEVEL 1

Rectangle C shows fourths.

WORKED REASONING • Clue 1 keeps only the rectangles with exactly 4 parts: A and C. Clue 2 keeps only the rectangles with equal parts: B, C, and D. Only Rectangle C passes both clues, so each of its 4 equal squares is $\frac{1}{4}$ of the rectangle. Rectangle A has 4 parts, but the parts are not equal. A thin strip is less than $\frac{1}{4}$ of the rectangle, and a wide strip is more than $\frac{1}{4}$.

WATCH FOR • Counting parts without checking their size. A student may say Rectangle A shows fourths because it has 4 pieces. To call all four pieces fourths of the whole, the four pieces must have equal area. Counting four pieces is not enough.

TRANSFER • No. The 3 parts are not equal, so none of them is $\frac{1}{3}$ of the square. One part is $\frac{1}{2}$ and the other two are each $\frac{1}{4}$.

2. Build It from Units

LEVEL 1

Maya needs 4 more pieces of $\frac{1}{8}$, because $7 - 3 = 4$.

WORKED REASONING • $\frac{7}{8}$ means 7 copies of $\frac{1}{8}$. Maya has placed 3 copies, which is $\frac{3}{8}$. Count on from 3: 4, 5, 6, 7. That is 4 more copies, so $7 - 3 = 4$. Equation: $\frac{3}{8} + \frac{4}{8} = \frac{7}{8}$. Model: a strip split into 8 equal parts, with 3 parts shaded dark, 4 more parts shaded light, and 1 part left blank.

WATCH FOR • Thinking the 8 in $\frac{7}{8}$ tells how many pieces to lay down. The denominator names the size of each piece (eighths), and the numerator counts how many of those pieces there are.

TRANSFER • 5 pieces of $\frac{1}{6}$ make $\frac{5}{6}$. With 2 already placed, 3 more are needed.

17. Units Are Bigger or Smaller

LEVEL 2

The mystery fraction is $\frac{3}{5}$.

WORKED REASONING • Clue 1 keeps $\frac{3}{8}$, $\frac{3}{5}$, and $\frac{3}{4}$. Clue 2: $\frac{3}{8}$ is less than $\frac{4}{8} = \frac{1}{2}$, so it fails. $\frac{3}{5}$ is more than half, because half of 5 fifths is 2 $\frac{1}{2}$ fifths and 3 fifths is more. $\frac{5}{8}$ and $\frac{3}{4}$ also pass. Clue 3: fifths and eighths are smaller than fourths, so $\frac{3}{4}$ fails. Only $\frac{3}{5}$ passes all three clues. $\frac{3}{5} > \frac{3}{8}$ because both count 3 units of the same strip, and a fifth is larger than an eighth.

WATCH FOR • Larger denominator means larger fraction. A student may think $\frac{3}{8} > \frac{3}{5}$ because $8 > 5$. Splitting the same whole into 8 parts makes each part smaller than splitting it into 5 parts.

TRANSFER • $\frac{2}{3} > \frac{2}{8}$, because thirds are larger than eighths. $\frac{3}{6} < \frac{5}{6}$, because both count sixths and 3 sixths is fewer than 5 sixths.

18. Benchmark Sort Check

LEVEL 2

The misplaced card is $\frac{7}{10}$. It belongs in the 'between $\frac{1}{2}$ and 1' bin.

WORKED REASONING • Clue 1 points to $\frac{3}{8}$, $\frac{1}{3}$, or $\frac{7}{10}$. Clue 2: $\frac{3}{8}$ is less than $\frac{4}{8}$, and $\frac{1}{3}$ is less than $1\frac{1}{2}$ thirds, so neither fits. $\frac{7}{10}$ does fit, because half of the whole is 5 tenths and 7 tenths is more. $\frac{7}{10}$ is also less than $\frac{10}{10}$, so it goes between $\frac{1}{2}$ and 1. Corrected bins: less than $\frac{1}{2}$ holds $\frac{3}{8}$ and $\frac{1}{3}$; equal to $\frac{1}{2}$ holds $\frac{4}{8}$; between $\frac{1}{2}$ and 1 holds $\frac{5}{6}$ and $\frac{7}{10}$.

WATCH FOR • Thinking a fraction with a large denominator, like 10, must be small. Compare the numerator to half the denominator, always for the same whole.

TRANSFER • Less than $\frac{1}{2}$: $\frac{2}{6}$. Equal to $\frac{1}{2}$: $\frac{6}{12}$. Between $\frac{1}{2}$ and 1: $\frac{5}{8}$ and $\frac{9}{10}$.

33. Group into Wholes

LEVEL 3

$11/3 = 3 \frac{2}{3}$ miles. After grouping 9 thirds into 3 wholes, $11 - 9 = 2$ thirds remain.

WORKED REASONING • Count thirds on the line: $3/3 = 1$, $6/3 = 2$, $9/3 = 3$. That uses 9 of the 11 thirds and makes 3 whole miles. Then $11 - 9 = 2$ thirds remain, which lands $2/3$ past 3. So $11/3 = 3 \frac{2}{3}$. In the same way, $7/4 = 1 \frac{3}{4}$ (4 fourths make 1, with 3 left) and $9/8 = 1 \frac{1}{8}$. Model sentence: $11/3$ miles is $3 \frac{2}{3}$ miles because 9 of the thirds group into 3 whole miles and 2 thirds are left.

WATCH FOR • Stopping after one group. A student may write $11/3 = 1 \frac{8}{3}$. That has the same value, but it is not a complete mixed number, because $8/3$ still holds 2 more wholes.

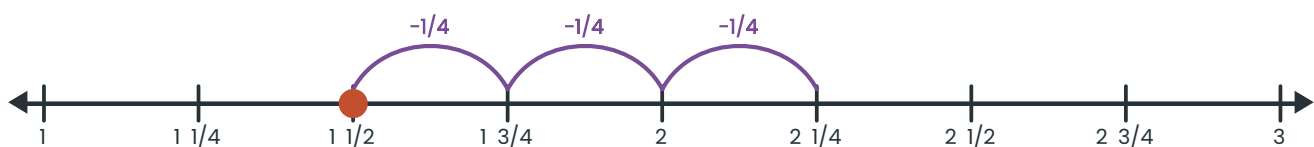
TRANSFER • $13/6 = 2 \frac{1}{6}$, because 12 sixths make 2 wholes and 1 sixth is left.

34. Mixed Numbers with Like Units

LEVEL 3

Rosa must walk $6/4$ miles, which is $1 \frac{2}{4}$ miles ($1 \frac{1}{2}$ is also accepted), because $9 - 3 = 6$ fourths.

THREE QUARTER-JUMPS BACK FROM $2 \frac{1}{4}$



WORKED REASONING • $2 \frac{1}{4} = 8/4 + 1/4 = 9/4$. Then $9/4 - 3/4 = 6/4$, because $9 - 3 = 6$ fourths. Group 4 fourths into 1 whole: $6/4 = 1 \frac{2}{4}$. Number line: from $2 \frac{1}{4}$, jump back $1/4$ to 2, back $1/4$ to $1 \frac{3}{4}$, and back $1/4$ to $1 \frac{2}{4}$. Check: $1 \frac{2}{4} + 3/4 = 1 \frac{5}{4} = 2 \frac{1}{4}$.

WATCH FOR • Subtracting the fraction parts backward: computing $3/4 - 1/4 = 2/4$ and writing $2 \frac{2}{4}$. When the fraction part is too small to subtract from, break one whole into fourths first.

TRANSFER • $2 \frac{1}{4}$ yards, because $7/4 + 2/4 = 9/4$.