

Fraction Model Detectives

Build, name and compare fractions with models.

GRADE 3 • 3.NS.3

3.NS.3 "The student will use mathematical reasoning and justification to represent and compare fractions (proper and improper) and mixed numbers with denominators of 2, 3, 4, 5, 6, 8, and 10), including those in context. Represent, name..."

NAME _____

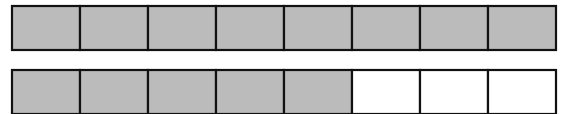
DATE _____

THE WHOLE AND ITS EQUAL PARTS

For a bar or rectangular region, one full bar or rectangle is one whole. Compare equal wholes. In a set, all listed counters together make the whole set. Count selected equal parts for the numerator and parts in one whole for the denominator. Explain your comparisons aloud unless asked to write.

WORKED EXAMPLE

Each bar is one whole. Name the shaded amount as an improper fraction and a mixed number.

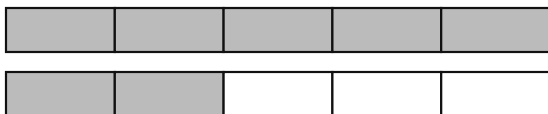


1. Count 8 + 5 shaded eighths to get 13 eighths.
2. One whole is $8/8$, leaving $5/8$.

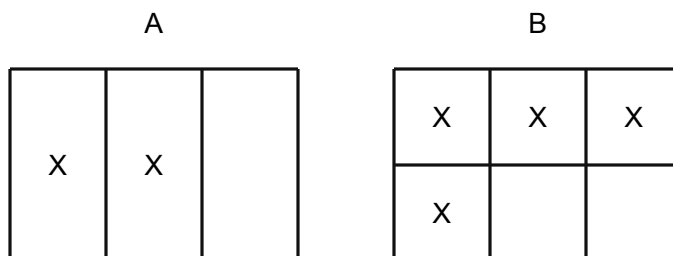
Answer: $13/8 = 1 \frac{5}{8}$.

PRACTICE 6 problems

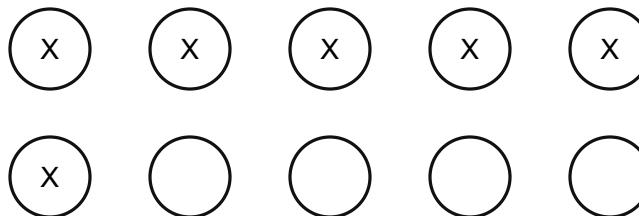
- 1** Count the shaded fifths. Write an improper fraction and mixed number. Use the model to split the shaded parts into two groups in two different ways; write both sums.



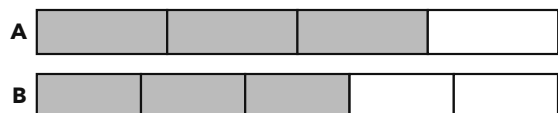
- 2** Each X selects a whole equal region. Write the fraction selected in A and B and compare them with $=$. Compare the amount in A with 0, $\frac{1}{2}$ and 1 using three symbols. Explain with the model aloud.



- 3** All 10 counters make one set. What fraction has X? Write it as a sum of unit fractions. Use groups of the marked counters to write two different two-part sums.



- 4** Compare the shaded lengths A and B using fractions and $<$, $>$ or $=$. They have the same numerator. Explain aloud why the part sizes matter.



ANSWER _____

- 5** Without a model, compare $1\frac{2}{3}$ and $1\frac{1}{3}$ using $>$, $<$ or $=$. Then compare $\frac{1}{4}$ with 0, $\frac{1}{2}$ and 1. Explain your reasoning aloud.

ANSWER _____

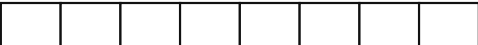
- 6** Compare A and B using fractions and a symbol. Then compare A with the benchmarks 0, $\frac{1}{2}$ and 1. Explain aloud using the lengths.

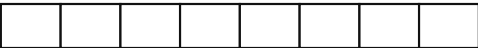


ANSWER _____

APPLY IT Show your work

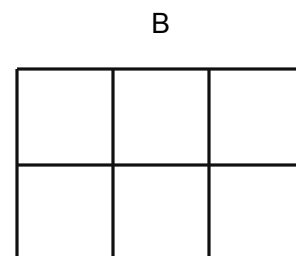
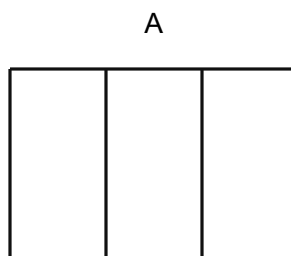
- 1** A ribbon piece is $\frac{6}{8}$ of a meter. Each empty bar is one meter. Shade 6 parts of each bar. Use a heavy divider to split the shaded parts into two groups. Choose a different grouping in the second bar. Write both sums that make $\frac{6}{8}$.

Way A 

Way B 

2

A recipe fills $\frac{2}{3}$ of a rectangular pan. The equal rectangles model the same pan. Put X in two of the three parts of A. In B, mark the same total area using sixths. Write the equivalent fractions and explain aloud.



CHALLENGE One step up

Nora says $\frac{5}{6}$ is closer to 1 than to $\frac{1}{2}$. Is she correct? Write the distance to each benchmark and explain your answer.

Accept equivalent correct sums and comparisons. Compared bars and rectangles have equal wholes. An X selects one whole region or counter. Check model marks, fractions and spoken reasoning.

PRACTICE 1

$7/5 = 1\ 2/5$. Examples: $7/5 = 5/5 + 2/5 = 4/5 + 3/5$. Each sum includes all seven fifths.

PRACTICE 2

A is $2/3$ and B is $4/6$, so $2/3 = 4/6$. Also $2/3 > 0$, $2/3 > 1/2$ and $2/3 < 1$. Four sixths exceeds three sixths but is less than the whole.

PRACTICE 3

$6/10 = 1/10 + 1/10 + 1/10 + 1/10 + 1/10 + 1/10$. Examples: $6/10 = 3/10 + 3/10 = 2/10 + 4/10$.

PRACTICE 4

$3/4 > 3/5$. With equal wholes, fourths are larger than fifths; three fourths is greater than three fifths.

PRACTICE 5

$1\ 2/3 > 1\ 1/3$: the whole numbers match and two thirds exceeds one third. $1/4 > 0$, $1/4 < 1/2$ and $1/4 < 1$.

PRACTICE 6

$4/6 > 3/6$. Also $4/6 > 0$, $4/6 > 1/2$ and $4/6 < 1$. The common denominator gives equal part sizes; $3/6$ is one half.

APPLY IT 1

Shade six eighths in both bars. Possible groupings: $6/8 = 2/8 + 4/8$ and $6/8 = 3/8 + 3/8$.
Accept any two distinct positive two-part decompositions of the six shaded eighths.

APPLY IT 2

Mark two thirds in A and four sixths in B. $2/3 = 4/6$.
Each third covers two sixths. The selected area is unchanged.

CHALLENGE

Yes. It is $1/6$ from 1 and $2/6$ from $1/2$, so it is closer to 1.