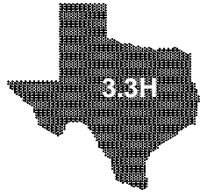


# COMPARING FRACTIONS



The student is expected to compare two fractions having the same numerator or denominator in problems by reasoning about their sizes and justifying the conclusion using symbols, words, objects, and pictorial models.

## TELL ME MORE...

Fractions can be compared only when the wholes are the same size. See the examples below to understand how to compare two fractions when the denominator is the same and how to compare two fractions when the numerator is the same.

### Equivalent Denominators

This means each whole is broken into the same size parts. So, look at the numerator and determine which fraction has more parts!

$$\frac{3}{6} < \frac{5}{6}$$

$\frac{3}{6}$  is less than  $\frac{5}{6}$  because it has less parts shaded.

### Equivalent Numerators

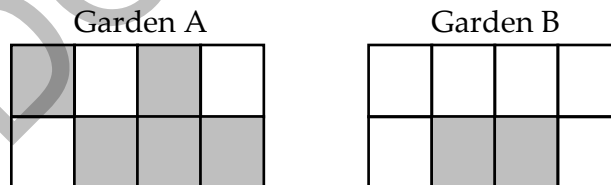
Each whole is broken into the different size parts. So, think about the size of each part!

$$\frac{3}{6} > \frac{3}{8}$$

$\frac{3}{6}$  is greater than  $\frac{3}{8}$  because sixths are greater than eighths. This is because the whole is not divided into as many parts.

## EXAMPLES

**Example 1:** Cameron is planting two identical gardens. The models below are shaded to represent the fraction of each garden where Cameron has planted vegetables.



Write a comparison of these two fractions using the  $<$  symbol.

**Step 1:** Determine the fraction that represents the portion of Garden A where Cameron has planted vegetables.

- Garden A is divided into eight equal parts or eighths.
- 5 eighths or  $\frac{5}{8}$  are shaded.

# COMPARING FRACTIONS

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The fraction  $\frac{5}{8}$  represents the portion of Garden A where Cameron has planted vegetables.

**Step 2:** Determine the fraction that represents the portion of Garden B where Cameron has planted vegetables.

- Garden B is divided into eight equal parts or eighths.
- 2 eighths or  $\frac{2}{8}$  are shaded.

The fraction  $\frac{2}{8}$  represents the portion of Garden B where Cameron has planted vegetables.

**Step 3:** Compare the two fractions represented in the models. Both models are divided into the same number of parts, which means each part in both models is the same size.

Garden A has more parts shaded than Garden B.

**Garden A represents a larger fraction than Garden B.**

**Step 4:** Write a comparison statement using the  $<$  symbol.

The symbol reads “less than”.

This means the smaller fraction will go in front of the less than symbol and the larger fraction will go behind the less than symbol.

$\frac{2}{8}$  is less than  $\frac{5}{8}$ .

$$\frac{2}{8} < \frac{5}{8}$$

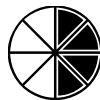
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**Example 2:** Both models below have been divided into equal parts. The models are shaded to show two fractions.

Model A



Model B



Write a comparison statement using the  $>$  symbol to compare the two fractions represented by the shaded portion of each model.

**Step 1:** Write the fraction represented by Model A.

- Model A is divided into 6 equal parts or sixths.
- 4 sixths or  $\frac{4}{6}$  are shaded.

**The fraction represented by model A is  $\frac{4}{6}$ .**

**Step 2:** Write the fraction represented by Model B.

- Model B is divided into 8 equal parts or eighths.
- 4 eighths or  $\frac{4}{8}$  are shaded.

# COMPARING FRACTIONS

The fraction represented by model A is  $\frac{4}{6}$ .

- Step 3:** Compare the two fractions represented in the models.
- Each fraction has the same number of parts shaded.
  - Model A is divided into 6 parts, and Model B is divided into 8 parts.
  - The parts in model A are larger because the whole was partitioned into less parts.

The fraction represented by Model A is greater than the fraction represented by Model B.

- Step 4:** Write a comparison statement using the  $>$  symbol.
- The symbol reads “greater than”. This means the larger fraction will go in front of the greater than symbol and the smaller fraction will go behind the greater than symbol.

$$\frac{4}{6} \text{ is greater than } \frac{4}{8}$$

$$\frac{4}{6} > \frac{4}{8}$$

**Make a Note...**

How can knowing fractions that are equivalent to  $\frac{1}{2}$  help compare the two fractions in example 2?

**You Try It!**

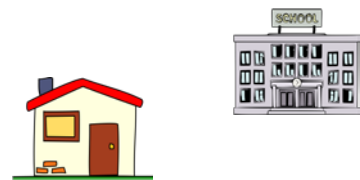
Use the models below to compare the two fractions below.



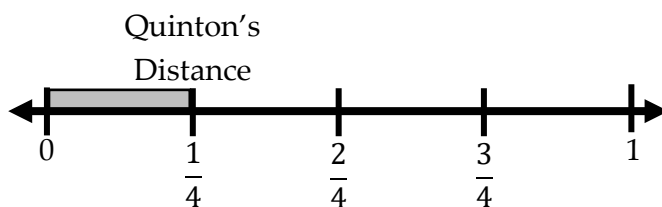
$$\frac{1}{3} \quad \frac{1}{8}$$

1. Shade  $\frac{1}{3}$ .
2. Shade  $\frac{1}{8}$ .
3. Compare the models, and write a  $<$ ,  $>$ , or  $=$  symbol between the two fractions.

**Example 3:** Quinton and Carlos are racing home from school. Quinton has gone  $\frac{1}{4}$  of the distance. Carlos has gone  $\frac{1}{6}$  of the distance. Who has gone further?

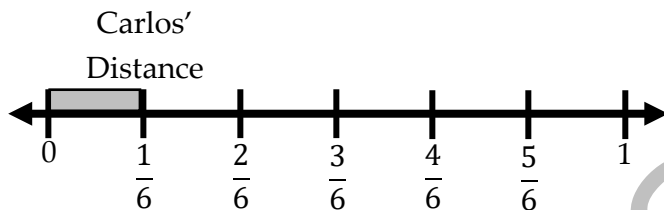


- Step 1:** Draw a number line to represent Quinton’s distance.
- Partition the number line into 4 equal parts.
  - Use the number line to show that Quinton has traveled  $\frac{1}{4}$  of the distance.

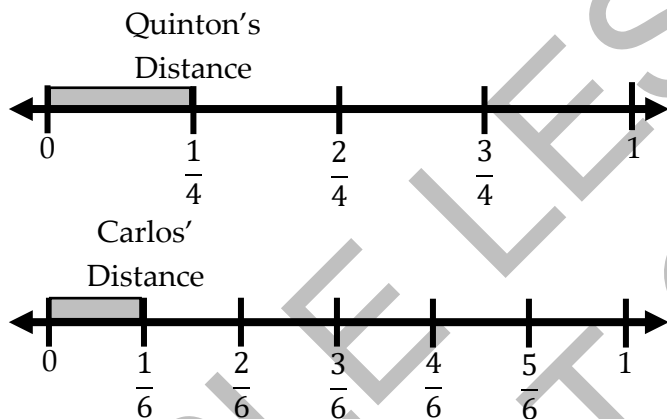


# COMPARING FRACTIONS

- Step 2:** Draw a number line to represent Carlos' distance.
- Make sure the length of the number line is equal to the length of the number line that represents Quinton's distance.
  - Partition the number line into 6 equal parts.
  - Use the number line to show that Carlos traveled  $\frac{1}{6}$  of the distance.



- Step 3:** Use the number lines to compare Quinton and Carlos' distances.



The number lines show that Quinton has gone further than Carlos or  $\frac{1}{4} > \frac{1}{6}$ .



## PRACTICE

For questions 1-3, name the fraction represented by each model, and then write the comparison statement with the given symbol.

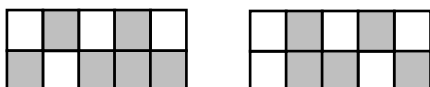
1. Write a comparison statement using the  $>$  symbol.



3. Write a comparison statement using the  $>$  symbol.



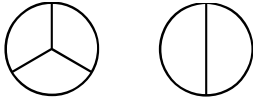
2. Write a comparison statement using the  $<$  symbol.



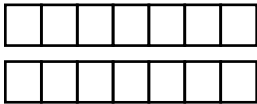
# COMPARING FRACTIONS

For questions 4-6, use the models given to represent each fraction and then write a comparison statement with the given symbol.

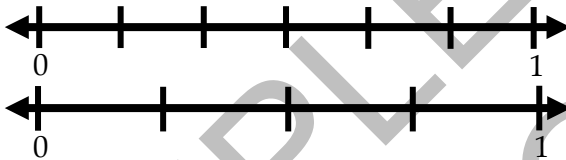
4. Write a comparison statement with the < symbol to compare  $\frac{1}{3}$  and  $\frac{1}{2}$ .



5. Write a comparison statement with the > symbol to compare  $\frac{5}{7}$  and  $\frac{4}{7}$ .



6. Write a comparison statement with the < to compare  $\frac{2}{6}$  and  $\frac{2}{4}$ .



7. Karen and Ted each ordered a large pizza. Karen ate  $\frac{3}{10}$  of her pizza. Ted ate  $\frac{5}{10}$  of his pizza. Who ate more pizza?

8. Aracely is making dresses for her doll. She needs  $\frac{7}{8}$  of a yard of fabric for one dress and  $\frac{7}{10}$  of a yard for another dress. Compare these two fractions using the > symbol.

9. Sherry and Dina each had candy bars that were the same size. Sherry ate  $\frac{3}{4}$  of her candy bar. Dina ate  $\frac{3}{6}$  of her candy bar. Which statement is true?

F The girls ate the same amount of candy, because both fractions have a numerator of 3.

G Dina ate more candy, because a denominator of 6 is larger than a denominator of 4.

H Sherry ate more candy, because each part of a candy bar cut into 4 parts is larger than each part of a candy bar cut into 6 parts.

J There is not enough information to determine who ate more pie.

10. Eddy shaded the following same-sized models to represent two different fractions.



Based on these models, which comparison is true?

A  $\frac{2}{8} = \frac{2}{10}$

B  $\frac{2}{8} > \frac{2}{10}$

C  $\frac{2}{10} > \frac{2}{8}$

D  $\frac{2}{10} > \frac{6}{8}$