Subtract Fractions Using Models

R 4.3(E) Represent and solve addition and subtraction of fractions with equal denominators using objects and pictorial models that build to the number line and properties of operations.

S 4.3(F) Evaluate the reasonableness of sums and differences of fractions using benchmark fractions 0, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, and 1, referring to the same whole.

Understand the TEKS

To subtract fractions with like denominators, subtract the numerators and keep the same denominator.

Check your answer by comparing it to common fractions 0, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, or 1.

You can also use models to subtract fractions.

Did You Know?

NUMBER SENSE

To subtract a fraction from 1, change the 1 to a fraction. Any fraction with the same numerator and denominator is equal to 1. For example, $\frac{3}{3}$ and $\frac{7}{7}$ are equal to 1.

Maria is baking bread. The recipe calls for $\frac{5}{8}$ cup of rye flour. She has already measured $\frac{2}{8}$ cup of rye flour. How many more cups of rye flour does she need to measure?

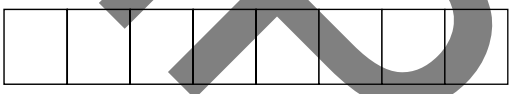
Use a model to subtract fractions.

Step 1 Use a fraction bar to model the subtraction.

The denominator of the fractions is 8. Divide the bar into 8 equal parts.

The first fraction is $\frac{5}{8}$. Shade 5 parts of the bar.

The second fraction is $\frac{2}{8}$. Draw an X through 2 shaded parts of the bar to take away those parts.

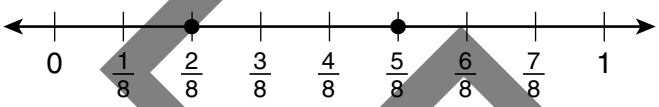


How many shaded sections are left? _____

You can also use a number line to model the subtraction.

Draw a point at $\frac{2}{8}$ and $\frac{5}{8}$.

How many spaces are between $\frac{2}{8}$ and $\frac{5}{8}$? _____



Step 2 Write a number sentence to show the answer.

Since the denominators are the same, subtract the numerators and keep the same denominator.

$\frac{5}{8} - \frac{2}{8} = —$

Step 3 Estimate to see if answer is reasonable.

$\frac{5}{8} > \frac{1}{2}$ and $\frac{2}{8} = \frac{1}{4}$. $\frac{1}{2} - \frac{1}{4} = \frac{1}{4}$, and $\frac{3}{8} > \frac{1}{4}$

The answer is reasonable because $\frac{1}{4}$ is subtracted from a fraction greater than $\frac{1}{2}$, leaving a fraction greater than $\frac{1}{4}$.

How many more cups of rye flour does she need to measure? _____

★ Practice

DIRECTIONS Read and answer each question carefully.

1 Which problem about Joe's allowance could **NOT** be represented by the model shown?

Ⓐ Joe spent $\frac{3}{12}$ of his allowance at the skate park on Saturday. He spent $\frac{1}{12}$ more on Sunday than on Saturday.

Ⓑ Joe spent $\frac{1}{12}$ of his allowance at the fair. He spent $\frac{5}{12}$ more at the video game store than at the fair.

Ⓒ Joe spent $\frac{4}{12}$ of his allowance at the bookstore and $\frac{2}{12}$ less at the pet store.

Ⓓ Joe spent $\frac{5}{12}$ of his allowance on school supplies and $\frac{3}{12}$ less at the convenience store.

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2 Last week Phoebe only finished $\frac{1}{3}$ of her weekly chores. She has to make up for the fraction of the chores she missed this week.

Which statement is correct?

Ⓐ The number line model of the problem would have 3 ticks between the whole numbers.

Ⓑ Phoebe has to do five-thirds of her chores this week.

Ⓒ Phoebe has to do five-sixths of her chores this week.

Ⓓ The number line model for the problem will show sixths.

3 Charlie ate $\frac{2}{8}$ of a waffle. Mary ate the same amount of the same waffle.

Would it be reasonable to say that $\frac{1}{2}$ of the waffle is left? Why or why not?

Ⓐ Yes, since $\frac{2}{8} = \frac{1}{4}$, $\frac{1}{4} + \frac{1}{4} = \frac{1}{2}$ and $1 - \frac{1}{2} = \frac{1}{2}$

Ⓑ Yes, since $\frac{2}{8} = \frac{1}{4}$ and $1 - \frac{1}{4} = \frac{3}{4}$

Ⓒ No, since $\frac{2}{8} > \frac{1}{4}$, $\frac{2}{8} + \frac{2}{8} > \frac{1}{2}$, leaving less than $\frac{1}{2}$

Ⓓ No, since $\frac{2}{8} < \frac{1}{4}$, $\frac{2}{8} + \frac{2}{8} < \frac{1}{2}$ leaving more than $\frac{1}{2}$

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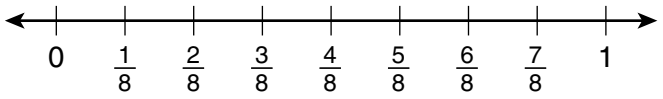
4 Javier and Dan are on opposite sides of the field. Javier did somersaults across $\frac{3}{10}$ of the field toward Dan. Dan did handsprings across $\frac{4}{10}$ of the field toward Javier.

Shade the model to represent the distance Javier and Dan covered. Show Javier's distance on the left and Dan's distance on the right.

Javier **Dan**

5 Use the number line to help you answer the question.



Lisa was $\frac{7}{8}$ of the way to her grandmother's house when she realized she had dropped her keys. She went $\frac{2}{8}$ of the way back to find them.

How many more blocks does Lisa have to go to her grandmother's house if $\frac{1}{8}$ equals 4 blocks?

Write your answer in the box.

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6 The students voted on the next class field trip. $\frac{13}{30}$ of the votes were for the zoo. $\frac{9}{30}$ of the votes were for the science museum. The rest of the votes were for the art museum.

Which fraction represents the difference between the number of votes for the zoo and the art museum?

Ⓐ $\frac{1}{30}$

Ⓑ $\frac{4}{30}$

Ⓒ $\frac{5}{30}$

Ⓓ $\frac{8}{30}$

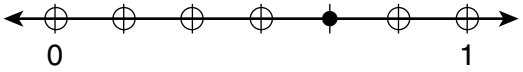
7 Jean walked and ran on a trail. This subtraction problem shows the difference between the distance Jean walked and the distance she ran.

$$\frac{4}{6} - \frac{3}{6} = \frac{1}{6}$$

The model shows a dot at $\frac{4}{6}$. Imagine you are going to draw an arrow to show the subtraction.

Where should the arrow end?

Fill in **ONE** location on the number line that plots the point.



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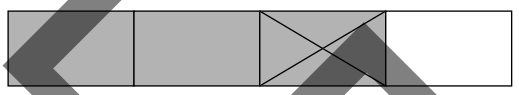
8 The cafeteria sold $\frac{1}{4}$ of the vegetables on Monday and $\frac{2}{4}$ on Tuesday. On Wednesday, it sold $\frac{1}{4}$ less than Monday and Tuesday combined.

Which model represents the fraction of the vegetables sold on Wednesday?

Ⓐ



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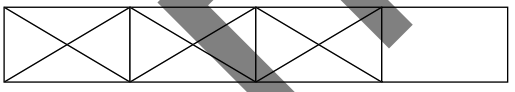

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