

# Understand Fraction Addition and Subtraction

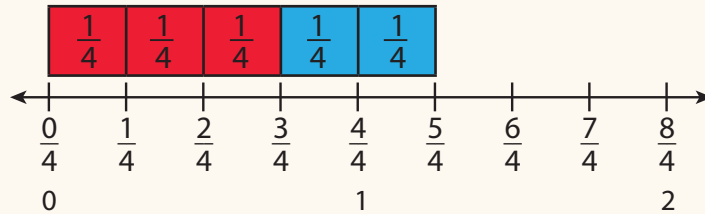


Dear Family,

This week your child is exploring fraction addition and subtraction.

Adding fractions means joining or putting together parts of the same whole. When you add  $\frac{3}{4}$  and  $\frac{2}{4}$ , you are putting one-fourths together.

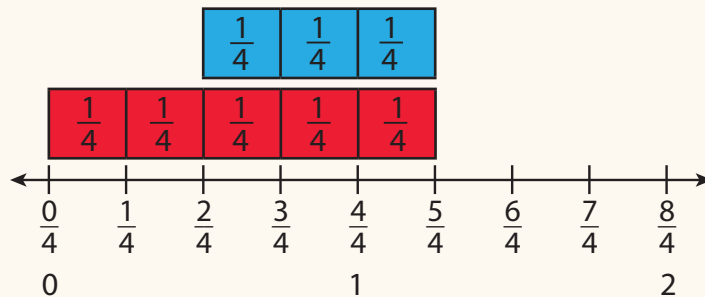
- You can use a number line to show  $\frac{3}{4} + \frac{2}{4} = \frac{5}{4}$ .



Subtracting fractions means separating or taking away. When you subtract  $\frac{3}{4}$  from  $\frac{5}{4}$ , you are taking away one-fourths.

- You can use a number line to show fraction subtraction, too.

The number line below shows  $\frac{5}{4} - \frac{3}{4} = \frac{2}{4}$ .



Adding and subtracting fractions is just like adding and subtracting whole numbers. When the denominators of the fractions are the same, you can just add or subtract the numerators.

Invite your child to share what he or she knows about fraction addition and subtraction by doing the following activity together.



## ACTIVITY FRACTION ADDITION AND SUBTRACTION

Do this activity with your child to explore adding and subtracting fractions.

**Materials** 1 piece of fruit (or a picture of 1 piece of fruit)

- Cut the fruit (or the picture of fruit) into sixths.

Explain that the 6 pieces should be the same size, so each piece is  $\frac{1}{6}$  of the whole.

- Have your child take some of the pieces.  
You take some of the pieces.
- Now talk about putting your pieces of fruit together.  
Ask: *How much of the whole fruit do you have together?*

*Example:* Your child takes  $\frac{2}{6}$ . You take  $\frac{3}{6}$ .

Together you have  $\frac{5}{6}$  of the fruit.

- Put your and your child's pieces of fruit together and look at the total.  
Have your child take some of the pieces.  
Ask: *How much of the whole fruit is left?*

*Example:* Your child takes 3 pieces.

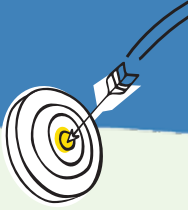
Start with  $\frac{5}{6}$ . Take away  $\frac{3}{6}$ .

That means  $\frac{2}{6}$  of the fruit is left.

- Look for other real-life opportunities to explore adding and subtracting fractions with your child.



# Explore Fraction Addition and Subtraction



What is really going on when you add and subtract numbers?



## Learning Target

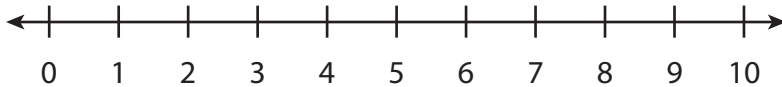
- Understand a fraction  $\frac{a}{b}$  with  $a > 1$  as a sum of fractions  $\frac{1}{b}$ .
- Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

**SMP** 1, 2, 3, 4, 5, 6, 7, 8

## MODEL IT

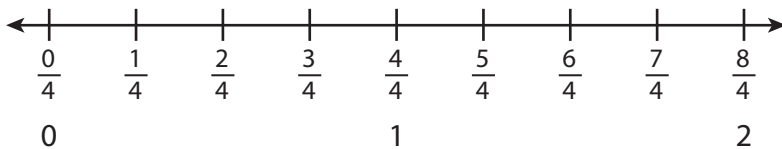
Complete the models below.

- 1 Show how to find  $2 + 3$  using a number line.



- 2 Think about how you could show  $\frac{2}{4} + \frac{3}{4}$  on the number line.

Show your work.



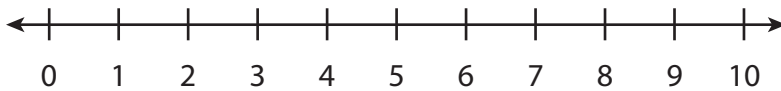
## DISCUSS IT

- Compare your number lines to your partner's number lines. Are they the same?
- I think adding fractions is like adding whole numbers because ...

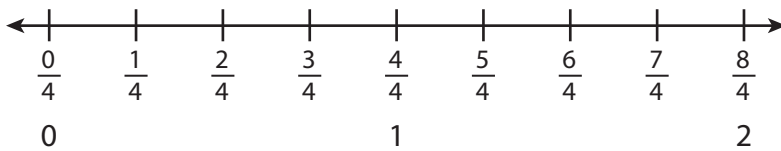
# MODEL IT

Complete the models below.

3 Draw to show  $5 - 2$  on the number line.



4 Think about how to show  $\frac{5}{4} - \frac{2}{4}$  on the number line.  
Show your work.



# 5 REFLECT

Compare a number line model for adding whole numbers and a number line model for adding fractions. How are they the same? How are they different?

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# DISCUSS IT

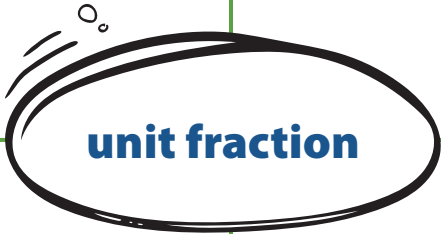
- How did you and your partner decide which fraction to start with?
- I think subtracting fractions is like subtracting whole numbers because ...
- I think subtracting fractions is different from subtracting whole numbers because ...



# Prepare for Fraction Addition and Subtraction

- 1 Think about what you know about unit fractions. Fill in each box. Use pictures, words, and numbers. Show as many ideas as you can.

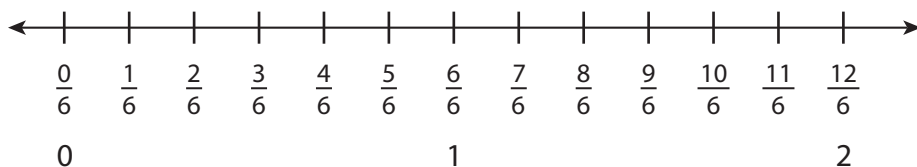
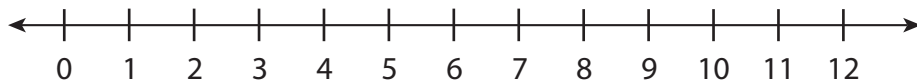
|                 |                  |
|-----------------|------------------|
| In My Own Words | My Illustrations |
| Examples        | Non-Examples     |

**unit fraction**

- 2 Show  $\frac{3}{8}$  using unit fractions.

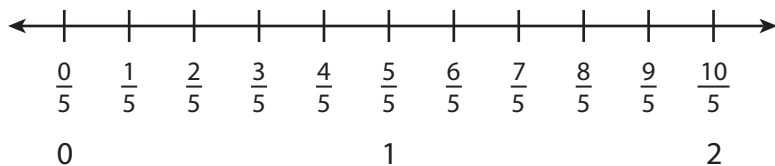
Solve.

- 3 Show  $3 + 4$  and  $\frac{3}{6} + \frac{4}{6}$  on the number lines below.



- 4 Look at problem 3. How are adding whole numbers and adding fractions alike? How are they different?

- 5 Show  $\frac{7}{5} - \frac{5}{5}$  on the number line below.



# Develop Understanding of Fraction Addition and Subtraction

## MODEL IT: NUMBER LINES

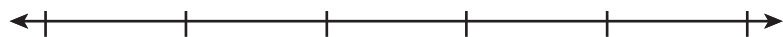
Try these two problems.

- 1 Label the number line below and use it to show  $\frac{2}{4} + \frac{1}{4}$ .



Write the sum. ....

- 2 Label the number line below and use it to show  $\frac{4}{5} - \frac{2}{5}$ .



Write the difference. ....



### DISCUSS IT

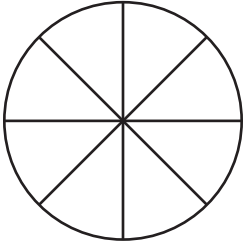
- Did you and your partner show adding and subtracting on the number lines the same way?
- I think number lines model adding and subtracting with fractions because ...



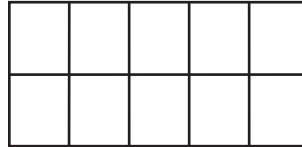
## MODEL IT: AREA MODELS

Use the area models to show adding or subtracting fractions.

3 Show  $\frac{1}{8} + \frac{2}{8}$ .



4 Show  $\frac{6}{10} - \frac{2}{10}$ .



## CONNECT IT

Complete the problems below.

- 5 How are the number lines and the area models alike?  
How are they different?

- 6 Choose any model you like to show  $\frac{5}{10} - \frac{3}{10}$ .



## DISCUSS IT

- How did you know how many equal parts to show in each model?
- I think the two different area models show fractions because . . .



# Practice Fraction Addition and Subtraction

Study how the Example shows adding fractions.

Then solve problems 1–12.

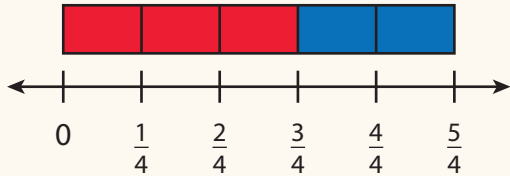
## EXAMPLE

You can count on or count back to add or subtract whole numbers.

You can do the same to add or subtract fractions.

To add fourths, use a number line that shows fourths.

Add  $\frac{3}{4}$  and  $\frac{2}{4}$ .



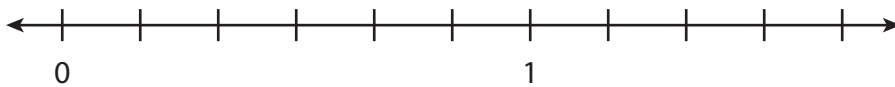
Start with  $\frac{3}{4}$ . One more fourth is  $\frac{4}{4}$ , and another fourth is  $\frac{5}{4}$ .

$$\frac{3}{4} + \frac{2}{4} = \frac{5}{4}$$

- 1 Count by sixths to fill in the blanks.

$\frac{1}{6}, \frac{2}{6}, \dots, \dots, \dots, \dots, \dots, \dots, \dots$

- 2 Now label the number line to show sixths.



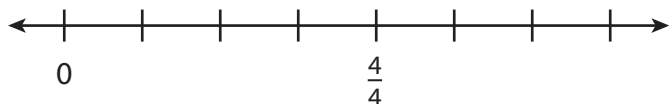
- 3 What is  $\frac{1}{6}$  more than  $\frac{2}{6}$ ? .....

- 4 What is  $\frac{1}{6}$  more than  $\frac{6}{6}$ ? .....

- 5 What is  $\frac{1}{6}$  less than  $\frac{2}{6}$ ? .....

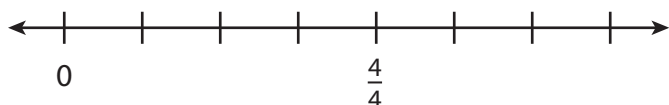
- 6 What is  $\frac{1}{6}$  less than  $\frac{6}{6}$ ? .....

- 7 Label the number line to show fourths.



- 8 Now use the number line in problem 7 to show  $\frac{2}{4} + \frac{2}{4}$ .

- 9 Label the number line below to show fourths again.



- 10 Now use the number line in problem 9 to show  $\frac{4}{4} - \frac{2}{4}$ .

- 11 Do  $\frac{5}{8} + \frac{2}{8}$  and  $\frac{4}{8} + \frac{3}{8}$  have the same total? Explain.

- 12 Look at the three area models. Which one would you choose to show  $\frac{1}{8} + \frac{2}{8}$ ?



Explain how the denominator of the fraction helps you choose the model.

# Refine Ideas About Fraction Addition and Subtraction

## APPLY IT

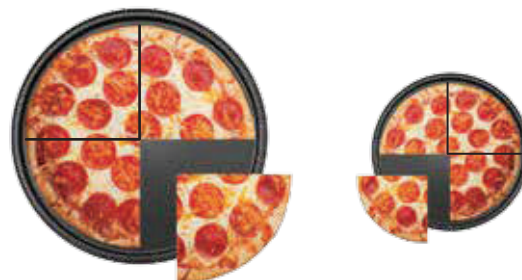
Complete these problems on your own.

### 1 COMPARE

Draw two different models to show  $\frac{2}{3} - \frac{1}{3}$ .

### 2 EXPLAIN

Rob has a large pizza and a small pizza. He cuts each pizza into fourths. He takes one fourth from each pizza and uses the following problem to show their sum:  $\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$ . What does Rob do wrong?



### 3 DEMONSTRATE

Think about how you add three whole numbers. You start by adding two of the numbers. Then you add the third number to that sum. You add three fractions the same way.

Use the number line and area model below to show  $\frac{1}{10} + \frac{3}{10} + \frac{4}{10}$ .



### PAIR/SHARE

Discuss your solutions for these three problems with a partner.

Use what you have learned to complete problem 4.

- 4 Jen has  $\frac{4}{10}$  of a kilogram of dog food. Luis has  $\frac{3}{10}$  of a kilogram of dog food. A large dog eats  $\frac{2}{10}$  of a kilogram in one meal.

**Part A** Write two different questions about this problem that involve adding or subtracting fractions.

Question 1:

Question 2:

**Part B** Choose one of your questions to model. Circle the question you choose. Show the addition or subtraction using a number line and an area model.



## 5 MATH JOURNAL

Look at the expression  $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$ . Is this sum greater than, less than, or equal to  $\frac{5}{8}$ ? Explain how you know.