Add and Subtract Fractions

Use What You Know

In Lesson 15, you learned that adding fractions is a lot like adding whole numbers. Take a look at this problem.

Lynn, Paco, and Todd split a pack of 12 baseball cards. Lynn gets 4 cards, Paco gets 3 cards, and Todd gets the rest of the cards. What fraction of the pack does Todd get?

a. How many cards do Lynn and Paco get altogether? _____

b. How many cards does Todd get? _____

c. There are 12 cards in the pack. What fraction represents the whole pack of cards? _____

d. If Lynn gets 4 cards out of 12, that means she gets $\frac{4}{12}$ of the pack. If Paco gets 3 cards out of 12, what fraction of the pack does he get? _____

e. What fraction of the pack do Lynn and Paco get altogether? _____

f. Explain how you could find the fraction of the pack that Todd gets.

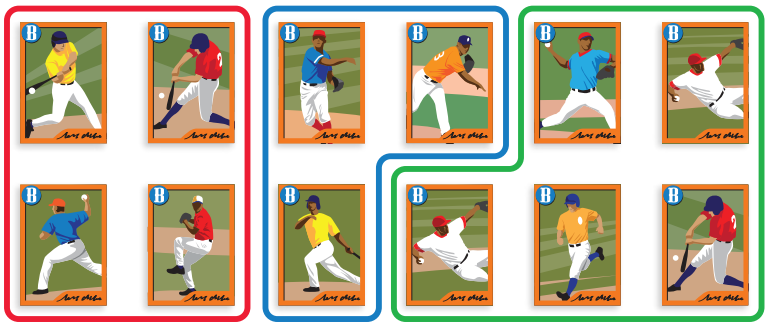
_____

_____

_____

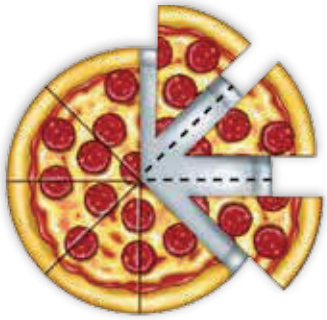
Find Out More

We often use **fractions** in real life. Fractions can describe something that has several equal parts, as in the baseball card problem. In that problem the "whole" is the pack of cards. Since there are 12 cards in the pack, each card represents $\frac{1}{12}$ of the whole.



$\frac{4}{12}$ $\frac{3}{12}$ $\frac{5}{12}$

Fractions in real life can also describe the equal parts of a single object, such as a pizza cut into 8 equal slices. The pizza is the "whole," and all the slices of pizza are equal parts of the same whole. Since there are 8 equal-sized slices, each slice is $\frac{1}{8}$ of the pizza. Even if a person takes away one or more slices, the "whole" is still the same 8 slices.



Reflect

1 Give another example of a "whole" object with equal parts that can be described by fractions.

Learn About Adding Fractions

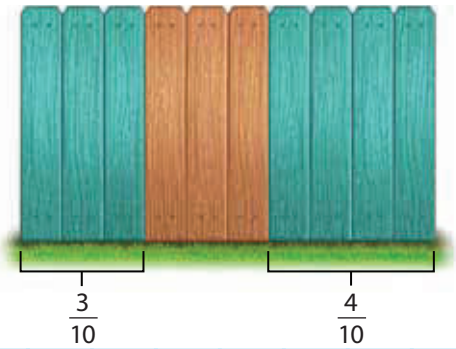
Read the problem. Then explore different ways to understand adding fractions.

Josie and Margo are painting a fence green. Josie starts at one end and paints $\frac{3}{10}$ of the fence. Margo starts at the other end and paints $\frac{4}{10}$ of it. What fraction of the fence do they paint?

Picture It You can use a picture to help understand the problem.

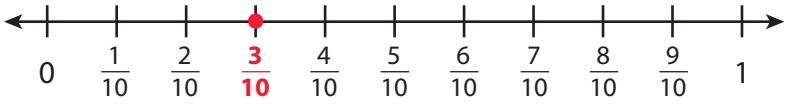
Think what the fence might look like. It has 10 equal-sized parts.

The girls paint 3 tenths and 4 tenths of the fence.

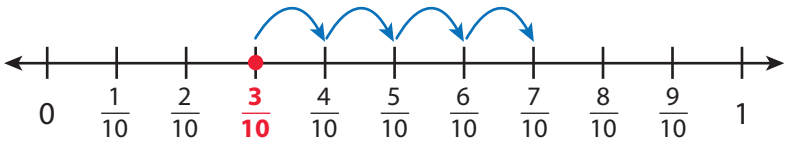


Model It You can also use a number line to help understand the problem.

The number line below is divided into tenths, with a point at $\frac{3}{10}$.



Start at $\frac{3}{10}$ and count 4 tenths to the right to **add** $\frac{4}{10}$.



Connect It Now you will solve the problem from the previous page using equations.

2 How do you know that each section of fence is $\frac{1}{10}$ of the total fence?

3 What do the numerators, 3 and 4, tell you? _____

4 How many sections of the fence did Josie and Margo paint altogether? _____

5 Complete the equations to show what fraction of the fence Josie and Margo painted altogether.

Use words: **3 tenths** + **4 tenths** = ☐ tenths

Use fractions: $\frac{3}{10} + \frac{4}{10} = \frac{\square}{10}$

6 Explain how you add fractions that have the same denominator.

Try It Use what you just learned to solve these problems. Show your work on a separate sheet of paper.

7 Lita and Otis are helping their mom clean the house. Lita cleaned $\frac{1}{3}$ of the rooms. Otis cleaned $\frac{1}{3}$ of the rooms. What fraction of the rooms did Lita and Otis clean altogether? _____

8 Mark's string is $\frac{1}{5}$ of a meter long. Bob's string is $\frac{3}{5}$ of a meter long. How long are the two strings combined? _____ of a meter

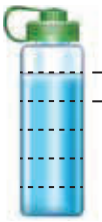
Learn About Subtracting Fractions

Read the problem. Then explore different ways to understand subtracting fractions.

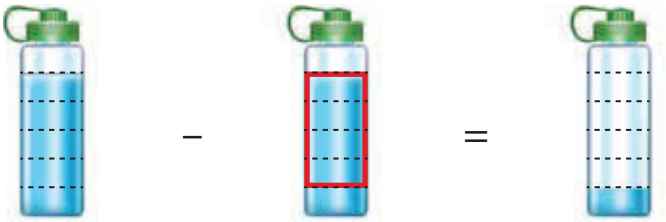
Alberto's 1-liter water bottle had $\frac{5}{6}$ of a liter of water in it. He drank $\frac{4}{6}$ of a liter. What fraction of a liter of water is left in the bottle?

Picture It You can use a picture to help understand the problem.

The following model shows the water bottle divided into 6 equal parts. Five shaded parts show how much water was in the bottle.

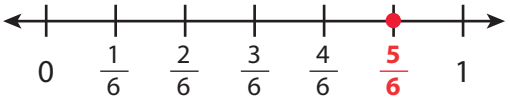


Alberto drank 4 sixths of a liter, so take away 4 shaded parts. The 1 shaded part that is left shows the fraction of a liter that is left.

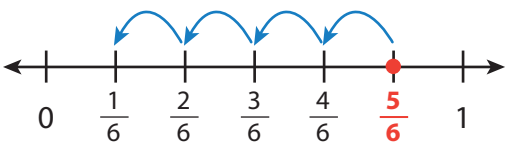


Model It You can also use a number line to help understand the problem.

The number line below is divided into sixths, with a point at $\frac{5}{6}$.



Start at $\frac{5}{6}$ and count back 4 sixths to **subtract** $\frac{4}{6}$.



Connect It **Now you will solve the problem from the previous page using equations.**

9 In *Picture It*, why does $\frac{1}{6}$ represent 1 of the equal parts of the bottle?

10 What do the numerators, 5 and 4, tell you? _____

11 How many sixths of a liter are left in the bottle after Alberto drank 4 sixths? _____

12 Complete the equations to show what fraction of a liter is left in the bottle.

Use words: **5 sixths** − **4 sixths** = ☐ sixth

Use fractions: $\frac{5}{6} - \frac{4}{6} = \frac{\square}{6}$

13 Explain how you subtract fractions with the same denominator.

Try It **Use what you just learned to solve these problems. Show your work on a separate sheet of paper.**

14 Mrs. Kirk had $\frac{3}{4}$ of a carton of eggs. She used $\frac{2}{4}$ of the carton to make breakfast. What fraction of the carton of eggs does Mrs. Kirk have left? _____

15 Carmen had $\frac{8}{10}$ of the lawn left to mow. She mowed $\frac{5}{10}$ of the lawn. Now what fraction of the lawn is left to mow? _____

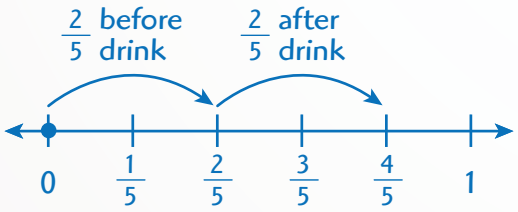
Practice Adding and Subtracting Fractions

Study the example below. Then solve problems 16–18.

Example

Jessica hiked $\frac{2}{5}$ of a mile on a trail before she stopped to get a drink of water. After her drink, Jessica hiked another $\frac{2}{5}$ of a mile. How far did Jessica hike in all?

Look at how you could show your work using a number line.



Solution Jessica hiked $\frac{4}{5}$ of a mile.

The student used labels and "jump" arrows to show each part of the hike on a number line. It is just like adding whole numbers!

Pair/Share
How else could you solve this problem?

16 Ruth made 1 fruit smoothie. She drank $\frac{1}{3}$ of it. What fraction of the fruit smoothie is left?

Show your work.

Solution _____

What fraction represents the whole fruit smoothie?

Pair/Share
How did you and your partner decide what fraction to start with?

17 Mr. Chang has a bunch of balloons. $\frac{3}{10}$ of the balloons are red. $\frac{2}{10}$ of the balloons are blue. What fraction of the balloons are neither red nor blue?

Show your work.

I think that there are at least two different steps to solve this problem.

Pair/Share
How is this problem different from the others you've seen in this lesson?

Solution _____

18 Emily ate $\frac{1}{6}$ of a bag of carrots. Nick ate $\frac{2}{6}$ of the bag of carrots. What fraction of the bag of carrots did Emily and Nick eat altogether? Circle the letter of the correct answer.

A $\frac{1}{6}$

B $\frac{1}{3}$

C $\frac{3}{6}$

D $\frac{3}{12}$

To find the fraction of the bag Emily and Nick ate altogether, should you add or subtract?

Rob chose **D** as the correct answer. How did he get that answer?

_____

_____

_____

Pair/Share
Does Rob's answer make sense?

Practice Adding and Subtracting Fractions

Solve the problems.

1 Liang bought some cloth. He used $\frac{5}{8}$ of a yard for a school project. He has $\frac{2}{8}$ of a yard left. How much cloth did Liang buy?

A $\frac{3}{8}$ of a yard

B $\frac{7}{16}$ of a yard

C $\frac{7}{8}$ of a yard

D $\frac{8}{8}$ of a yard

2 Carmela cut a cake into 12 equal-sized pieces. She ate $\frac{2}{12}$ of the cake, and her brother ate $\frac{3}{12}$ of the cake. What fraction of the cake is left?

A $\frac{1}{12}$

B $\frac{5}{12}$

C $\frac{7}{12}$

D $\frac{12}{12}$

3 Lee's muffin mix calls for $\frac{2}{3}$ cup of milk and $\frac{1}{3}$ cup of oil. How much more milk than oil does she need for the muffin mix?

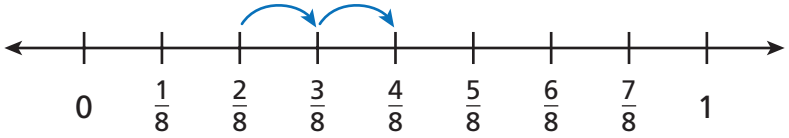
_____

4 Lucy and Melody are painting a room. They divided the room into 8 equal sections. Lucy painted 2 sections and Melody painted 4 sections. Which model can be used to find the total fraction of the room they painted? Circle the letters of all that apply.

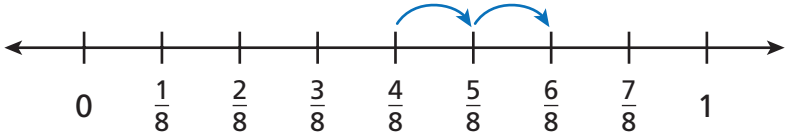
A

B

C



D



5 In all, Cole and Max picked $\frac{9}{10}$ of a bucket of blueberries. Cole picked $\frac{3}{10}$ of a bucket of blueberries. What fraction of a bucket of blueberries did Max pick?

Show your work.

Answer Max picked _____ of a bucket of blueberries.

6 A melon is cut into 8 equal slices. Together, Regan and Juanita will eat $\frac{5}{8}$ of the melon. What is one way the girls could eat that fraction of the melon?

Show your work. Write an equation to represent your answer.

Answer Regan could eat _____ of the melon, and

Juanita could eat _____ of the melon.

Equation _____

Self Check **Go back and see what you can check off on the Self Check on page 143.**