Name _____

Add Fractions Using Models

Essential Question How can you add fractions with like denominators using models?

Common Core **Numbers and Operations—Fractions—4.NF.B.3d** *Also 4.MD.A.2*

MATHEMATICAL PRACTICES
MP2, MP3, MP5

Unlock the Problem

Real World

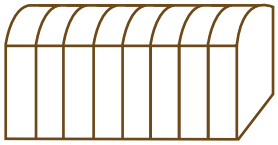
Ms. Clark made a loaf of bread. She used $\frac{1}{8}$ of the bread for a snack and $\frac{5}{8}$ of the bread for lunch. How much did she use for a snack and lunch?

One Way Use a picture.

$\frac{1}{8}$ is _____ eighth-size piece of bread.

$\frac{5}{8}$ is _____ eighth-size pieces of bread.

Shade 1 eighth-size piece. Then shade 5 eighth-size pieces.



snack lunch

Think: The pieces you shaded represent the pieces Ms. Clark used.

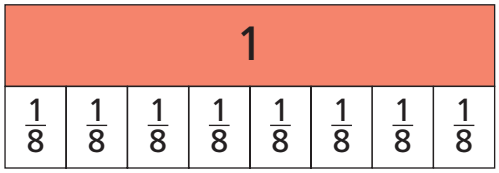
So, Ms. Clark used _____ eighth-size pieces, or $\frac{\square}{8}$ of the bread.

Another Way Use fraction strips.

The 1 strip represents the whole loaf.

Each $\frac{1}{8}$ part represents 1 eighth-size piece of bread.

Shade $\frac{1}{8}$. Then shade $\frac{5}{8}$.



Think: The model shows $\frac{1}{8} + \frac{5}{8}$.

How many $\frac{1}{8}$-size parts are shaded? _____

Write the sum. $\frac{1}{8} + \frac{5}{8} = \frac{\square}{8}$

So, Ms. Clark used _____ of the bread.

Math Talk

MATHEMATICAL PRACTICES 2

Reason Abstractly

Explain why $\frac{1}{8} + \frac{5}{8} \neq \frac{6}{16}$.

1. Explain how the numerator of the sum is related to the fraction strip model.

_____

_____

2. Explain how the denominator of the sum is related to the fraction strip model.

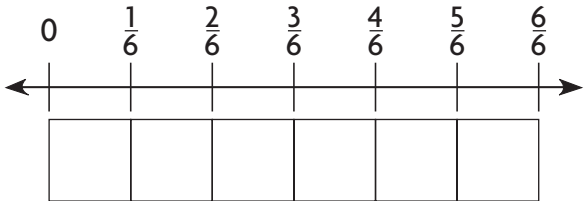
_____

_____

Example

Jacob needs two strips of wood to make masts for a miniature sailboat. One mast will be $\frac{3}{6}$ foot long. The other mast will be $\frac{2}{6}$ foot long. He has a strip of wood that is $\frac{4}{6}$ foot long. Is this strip of wood long enough to make both masts?

Shade the model to show $\frac{3}{6} + \frac{2}{6}$.



Write the sum. $\frac{3}{6} + \frac{2}{6} = \frac{\square}{6}$

Is the sum less than or greater than $\frac{4}{6}$? _____

So, the strip of wood _____ long enough to make both masts.

3. Explain how you used the number line to determine if the sum was less than $\frac{4}{6}$.

_____

_____

4. What if each mast was $\frac{2}{6}$ foot long? Could Jacob use the strip of wood to make both masts? Explain.

_____

Share and Show

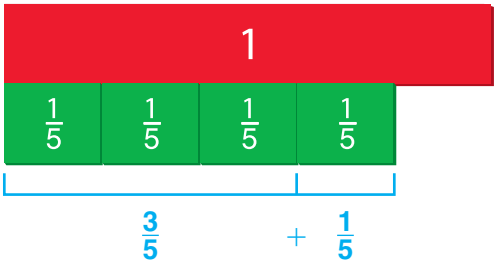
MATH BOARD

1. Adrian's cat ate $\frac{3}{5}$ of a bag of cat treats in September and $\frac{1}{5}$ of the same bag of cat treats in October. What part of the bag of cat treats did Adrian's cat eat in both months?

Use the model to find the sum $\frac{3}{5} + \frac{1}{5}$.

How many fifth-size pieces are shown? _____

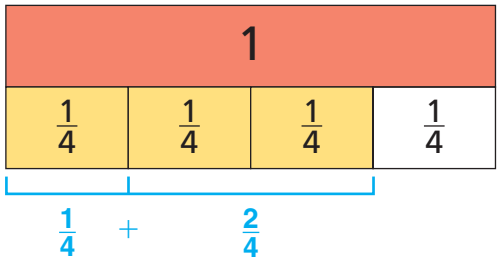
$\frac{3}{5} + \frac{1}{5} = \frac{\square}{5}$ of a bag



Name _____

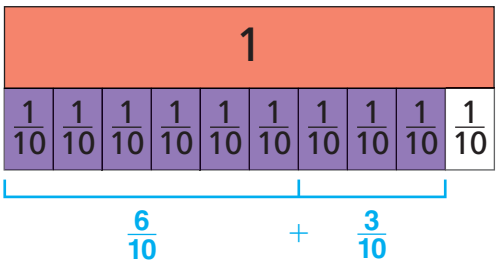
Use the model to find the sum.

2.



$\frac{1}{4} + \frac{2}{4} =$ _____

3.



$\frac{6}{10} + \frac{3}{10} =$ _____

Find the sum. Use models to help.

4. $\frac{3}{6} + \frac{3}{6} =$ _____

5. $\frac{5}{8} + \frac{2}{8} =$ _____

6. $\frac{1}{3} + \frac{1}{3} =$ _____

On Your Own

Math Talk MATHEMATICAL PRACTICES 3

Apply Explain how to add $\frac{2}{6} + \frac{3}{6}$.

Find the sum. Use models or *i*Tools to help.

7. $\frac{5}{8} + \frac{2}{8} =$ _____

8. $\frac{2}{5} + \frac{2}{5} =$ _____

9. $\frac{4}{6} + \frac{1}{6} =$ _____

10. GO DEEPER Jason is making a fruit drink. He mixes $\frac{2}{8}$ quart of grape juice with $\frac{3}{8}$ quart of apple juice. Then he adds $\frac{1}{8}$ quart of lemonade. How much fruit drink does Jason make?

_____

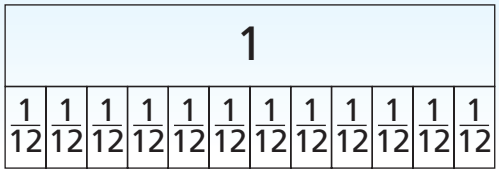
Problem Solving • Applications

Real World

11. THINK SMARTER A sum has five addends. Each addend is a unit fraction. The sum is 1. What are the addends?

_____

12. THINK SMARTER In a survey, $\frac{4}{12}$ of the students chose Friday and $\frac{5}{12}$ chose Saturday as their favorite day of the week. What fraction shows the students who chose Friday or Saturday as their favorite day? Shade the model to show your answer.



_____ of the students chose Friday or Saturday.

13. MATHEMATICAL PRACTICE 4 **Model Mathematics** Jin is putting colored sand in a jar. She filled $\frac{2}{10}$ of the jar with blue sand and $\frac{4}{10}$ of the jar with pink sand. Describe one way to model the part of the jar filled with sand.

Connect to Art

Stained Glass Windows

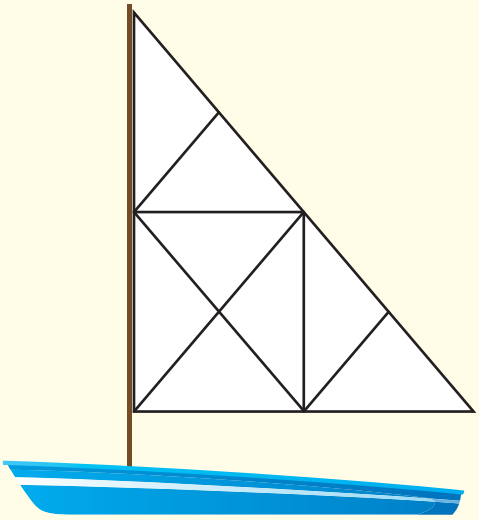
Have you ever seen a stained glass window in a building or home? Artists have been designing stained glass windows for hundreds of years.

Help design the stained glass sail on the boat below.

Materials ■ color pencils

Look at the eight triangles in the sail. Use the guide below to color the triangles:

- $\frac{2}{8}$ blue
- $\frac{3}{8}$ red
- $\frac{2}{8}$ orange
- $\frac{1}{8}$ yellow



14. MATHEMATICAL PRACTICE 4 **Write an Equation** Write an equation that shows the fraction of triangles that are red or blue.

15. GO DEEPER What color is the greatest part of the sail? Write a fraction for that color. How do you know that fraction is greater than the other fractions? Explain.

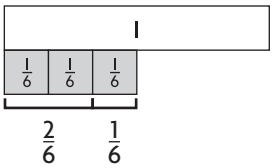
Name _____

Add Fractions Using Models

COMMON CORE STANDARD—4.NF.B.3d
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

Find the sum. Use fraction strips to help.

1. $\frac{2}{6} + \frac{1}{6} =$ $\frac{3}{6}$



2. $\frac{4}{10} + \frac{5}{10} =$ _____

3. $\frac{1}{3} + \frac{2}{3} =$ _____

4. $\frac{2}{4} + \frac{1}{4} =$ _____

5. $\frac{2}{12} + \frac{4}{12} =$ _____

6. $\frac{1}{6} + \frac{2}{6} =$ _____

Problem Solving Real World

7. Lola walks $\frac{4}{10}$ mile to her friend's house. Then she walks $\frac{5}{10}$ mile to the store. How far does she walk in all?

_____

8. Evan eats $\frac{1}{8}$ of a pan of lasagna and his brother eats $\frac{2}{8}$ of it. What fraction of the pan of lasagna do they eat?

_____

9. Jacqueline buys $\frac{2}{4}$ yard of green ribbon and $\frac{1}{4}$ yard of pink ribbon. How many yards of ribbon does she buy?

_____

10. Shu mixes $\frac{2}{3}$ pound of peanuts with $\frac{1}{3}$ pound of almonds. How many pounds of nuts does Shu mix?

_____

11. WRITE Math Find a recipe in a book or online that includes the amount of salt as a fraction. Model how to find the amount of salt needed when the recipe is doubled.

Lesson Check (4.NF.B.3d)

1. Mary Jane has $\frac{3}{8}$ of a medium pizza left. Hector has $\frac{2}{8}$ of another medium pizza left. How much pizza do they have altogether? Use models to help.

2. Jeannie ate $\frac{1}{4}$ of an apple. Kelly ate $\frac{2}{4}$ of the apple. How much did they eat together? Use models to help.

Spiral Review (4.NBT.B.5, 4.NBT.B.6, 4.NF.A.1)

3. Karen is making 14 different kinds of greeting cards. She is making 12 of each kind. How many greeting cards is she making?

4. Jefferson works part time and earns $1,520 in four weeks. How much does he earn each week?

5. By installing efficient water fixtures, the average American can reduce water use to about 45 gallons of water per day. Using such water fixtures, about how many gallons of water would the average American use in December?

6. Collin is making a bulletin board and note center. He is using square cork tiles and square dry-erase tiles. One of every 3 squares will be a cork square. If he uses 12 squares for the center, how many will be cork squares?

FOR MORE PRACTICE GO TO THE Personal Math Trainer