Name _____

Add and Subtract Parts of a Whole

Justin has $\frac{3}{8}$ pound of cheddar cheese and $\frac{2}{8}$ pound of brick cheese. How much cheese does he have in all?

Step 1 Use fraction strips to model the problem. Use three $\frac{1}{8}$-strips to represent $\frac{3}{8}$ pound of cheddar cheese.

Step 2 Join two more $\frac{1}{8}$-strips to represent the amount of brick cheese.

Step 3 Count the number of $\frac{1}{8}$-strips. There are _five_ $\frac{1}{8}$-strips. Write the amount as a fraction. Justin has _$\frac{5}{8}$_ pound of cheese.

Step 4 Use the model to write an equation. $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$

Suppose Justin eats $\frac{1}{8}$ pound of cheese. How much cheese is left?

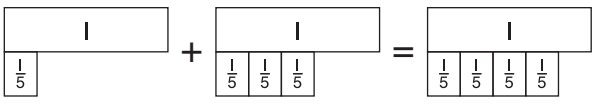
Step 1 Use five $\frac{1}{8}$-strips to represent the $\frac{5}{8}$ pound of cheese.

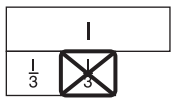
Step 2 Remove one $\frac{1}{8}$-strip to show the amount eaten.

Step 3 Count the number of $\frac{1}{8}$-strips left. There are _four_ $\frac{1}{8}$ fraction strips. There is _$\frac{4}{8}$_ pound left.

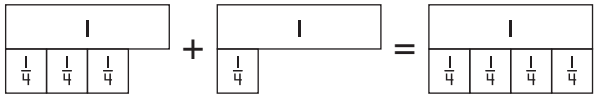
Step 4 Write an equation for the model. $\frac{5}{8} - \frac{1}{8} = \frac{4}{8}$

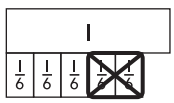
Use the model to write an equation.

1. 

2. 

_____ _____

3. 

4. 

_____ _____

Name _____

Write Fractions as Sums

A **unit fraction** tells the part of the whole that 1 piece represents.
A unit fraction always has a numerator of 1.

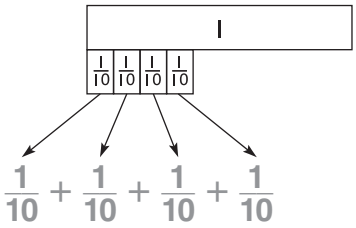
Bryan has $\frac{4}{10}$ pound of clay for making clay figures. He wants to use $\frac{1}{10}$ pound of clay for each figure. How many clay figures can he make?

Use fraction strips to write $\frac{4}{10}$ as a sum of unit fractions.

Step 1 Represent $\frac{4}{10}$ with fraction strips.

Step 2 Each $\frac{1}{10}$ is a unit fraction. Write a $\frac{1}{10}$ addend for each $\frac{1}{10}$-strip you used to show $\frac{4}{10}$.

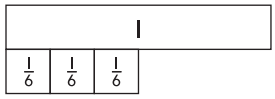
Step 3 Count the number of addends. The number of addends represents the number of clay figures Bryan can make.



So, Bryan can make 4 clay figures.

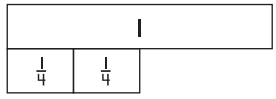
Write the fraction as the sum of unit fractions.

1.



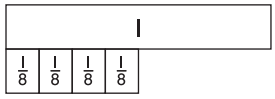
$\frac{3}{6} =$ ___ + ___ + ___

2.



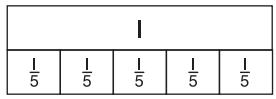
$\frac{2}{4} =$ ___ + ___

3.



$\frac{4}{8} =$ ___ + ___ + ___ + ___

4.



$\frac{5}{5} =$ ___ + ___ + ___ + ___ + ___

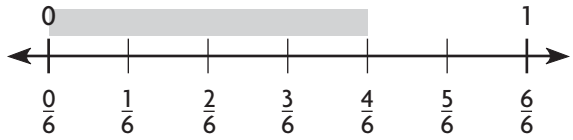
Name _____

Add Fractions Using Models

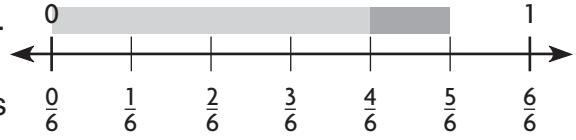
Fractions with like denominators have the same denominator. You can add fractions with like denominators using a number line.

Model $\frac{4}{6} + \frac{1}{6}$.

Step 1 Draw a number line labeled with sixths. Model the fraction $\frac{4}{6}$ by starting at 0 and shading 4 sixths.



Step 2 Add the fraction $\frac{1}{6}$ by shading 1 more sixth.

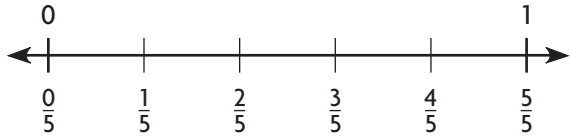


Step 3 How many sixths are there in all? 5 sixths

Write the number of sixths as a fraction.

5 sixths = $\frac{5}{6}$ $\frac{4}{6} + \frac{1}{6} = \frac{5}{6}$

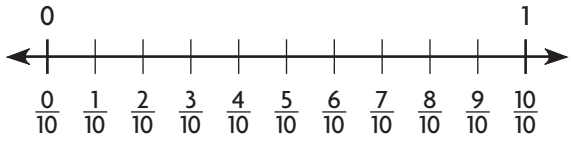
1. Model $\frac{1}{5} + \frac{4}{5}$.



$\frac{1}{5} + \frac{4}{5} =$ _____

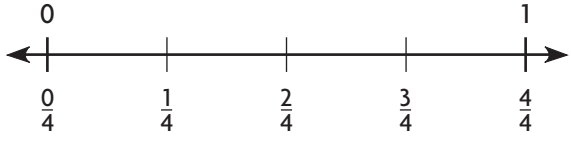
Find the sum. Use a model to help.

2. $\frac{2}{10} + \frac{4}{10}$



_____

3. $\frac{1}{4} + \frac{1}{4}$



_____

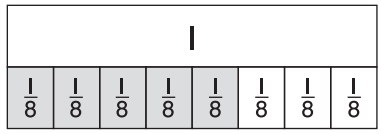
Name _____

Subtract Fractions Using Models

You can subtract fractions with like denominators using fraction strips.

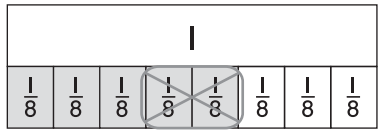
Model $\frac{5}{8} - \frac{2}{8}$.

Step 1 Shade the eighths you start with.
Shade 5 eighths.



Step 2 Subtract $\frac{2}{8}$.

Think: How many eighths are taken away?
Cross out **2** of the shaded eighths.

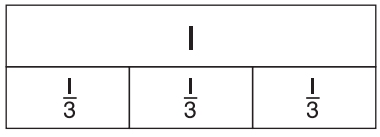


Step 3 Count the shaded eighths that remain.
There are **3** eighths remaining.

Step 4 Write the number of eighths that remain as a fraction.

3 eighths = $\frac{3}{8}$ $\frac{5}{8} - \frac{2}{8} = \frac{3}{8}$

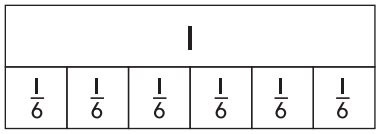
1. Model $\frac{3}{3} - \frac{2}{3}$.



$\frac{3}{3} - \frac{2}{3} =$ _____

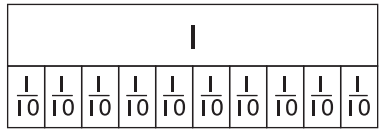
Subtract. Use fraction strips to help.

2. $\frac{5}{6} - \frac{1}{6}$



$\frac{5}{6} - \frac{1}{6} =$ _____

3. $\frac{6}{10} - \frac{3}{10}$



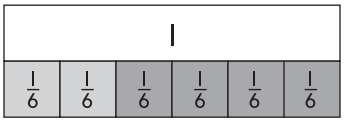
$\frac{6}{10} - \frac{3}{10} =$ _____

Name _____

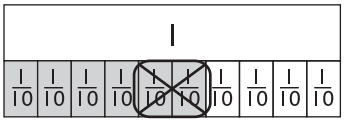
Add and Subtract Fractions

You can find and record the sums and the differences of fractions.

Add. $\frac{2}{6} + \frac{4}{6}$

Step 1 Model it.	**Step 2** Think: How many sixths are there in all?	**Step 3** Record it.
	There are 6 sixths. 6 sixths $= \frac{6}{6}$	Write the sum as an addition equation. $\frac{2}{6} + \frac{4}{6} = \frac{6}{6}$

Subtract. $\frac{6}{10} - \frac{2}{10}$

Step 1 Model it.	**Step 2** Think: There are 6 tenths. I take away 2 tenths. How many tenths are left?	**Step 3** Record it.
	There are 4 tenths left. 4 tenths $= \frac{4}{10}$	Write the difference as a subtraction equation. $\frac{6}{10} - \frac{2}{10} = \frac{4}{10}$

Find the sum or difference.

1. 7 eighth-size parts − 4 eighth-size parts = _____

$\frac{7}{8} - \frac{4}{8} =$ _____

2. $\frac{11}{12} - \frac{4}{12} =$ _____ **3.** $\frac{2}{10} + \frac{2}{10} =$ _____ **4.** $\frac{6}{8} - \frac{4}{8} =$ _____

5. $\frac{2}{4} + \frac{2}{4} =$ _____ **6.** $\frac{4}{5} - \frac{3}{5} =$ _____ **7.** $\frac{1}{3} + \frac{2}{3} =$ _____

Name _____

Rename Fractions and Mixed Numbers

A **mixed number** is made up of a whole number and a fraction. You can use multiplication and addition to rename a mixed number as a fraction greater than 1.

Rename $2\frac{5}{6}$ as a fraction.

First, multiply the denominator, or the number of parts in the whole, by the whole number.

$6 \times 2 = 12$

Then, add the numerator to your product.

$12 + 5 = 17$

So, $2\frac{5}{6} = \frac{17}{6}$.

$2\frac{5}{6} = \frac{17}{6}$

17 — total number of parts

6 — number of parts in the whole

You can use division to write a fraction greater than 1 as a mixed number.

Rename $\frac{16}{3}$ as a mixed number.

To rename $\frac{16}{3}$ as a mixed number, divide the numerator by the denominator.

Use the quotient and remainder to write a mixed number.

So, $\frac{16}{3} = 5\frac{1}{3}$.

$$\begin{array}{r} 5 \\ 3\overline{)16} \\ -\,15 \\ \hline 1 \end{array}$$

Write the mixed number as a fraction.

1. $3\frac{2}{3} =$ _____ **2.** $4\frac{3}{5} =$ _____ **3.** $4\frac{3}{8} =$ _____ **4.** $2\frac{1}{6} =$ _____

Write the fraction as a mixed number.

5. $\frac{32}{5} =$ _____ **6.** $\frac{19}{3} =$ _____ **7.** $\frac{15}{4} =$ _____ **8.** $\frac{51}{10} =$ _____

Name _____

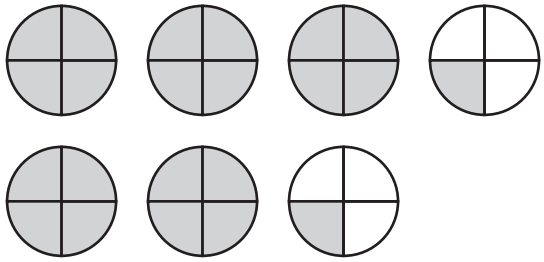
Add and Subtract Mixed Numbers

Find the sum. $3\frac{1}{4} + 2\frac{1}{4}$

Add the whole number and fraction parts.

- Add the whole numbers: $3 + 2 = 5$
- Add the fractions: $\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$

Write the sum as a mixed number, so the fractional part is less than 1. $3\frac{1}{4} + 2\frac{1}{4} = 5\frac{2}{4}$

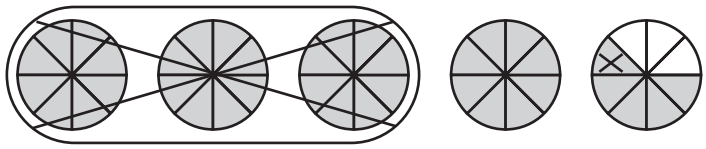


Find the difference. $4\frac{5}{8} - 3\frac{1}{8}$

Subtract the fraction and the whole number parts.

- Subtract the fractions: $\frac{5}{8} - \frac{1}{8} = \frac{4}{8}$
- Subtract the whole numbers: $4 - 3 = 1$

$4\frac{5}{8} - 3\frac{1}{8} = 1\frac{4}{8}$



Find the sum or difference.

1. $3\frac{4}{5} + 4\frac{3}{5}$ = _____

2. $7\frac{2}{3} - 3\frac{1}{3}$ = _____

3. $4\frac{7}{12} + 6\frac{5}{12}$ = _____

4. $12\frac{3}{4} - 6\frac{1}{4}$ = _____

5. $2\frac{3}{8} + 8\frac{1}{8}$ = _____

6. $11\frac{9}{10} - 3\frac{7}{10}$ = _____

7. $7\frac{3}{5} + 4\frac{3}{5}$ = _____

8. $8\frac{3}{6} - 3\frac{1}{6}$ = _____

Name _____

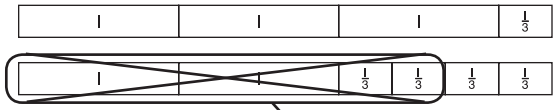
Subtraction with Renaming

Fraction strips can help you subtract mixed numbers or subtract a mixed number from a whole number.

Find the difference. $3\frac{1}{3} - 2\frac{2}{3}$

Step 1 Model the number you are subtracting from, $3\frac{1}{3}$.

Step 2 Because you cannot subtract $\frac{2}{3}$ from $\frac{1}{3}$ without renaming, change one of the 1 strips to three $\frac{1}{3}$ strips. Then subtract by crossing out two wholes and two $\frac{1}{3}$ strips.

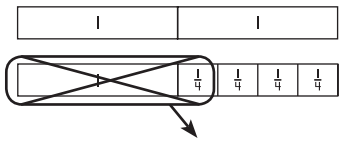


So, $3\frac{1}{3} - 2\frac{2}{3} = \frac{2}{3}$.

Find the difference. $2 - 1\frac{1}{4}$

Step 1 Model the number you are subtracting from, 2.

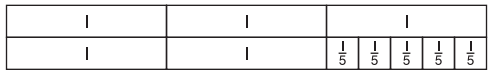
Step 2 Because you cannot subtract $\frac{1}{4}$ from 1 without renaming, change one of the 1 strips to four $\frac{1}{4}$ strips. Then subtract by crossing out one whole and one $\frac{1}{4}$ strip.



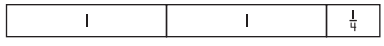
So, $2 - 1\frac{1}{4} = \frac{3}{4}$.

Find the difference.

1. $3 - 2\frac{2}{5} =$ _____



2. $2\frac{1}{4} - 1\frac{3}{4} =$ _____



3. $3\frac{3}{5} - 2\frac{4}{5}$

4. $3\frac{1}{12} - 2\frac{11}{12}$

5. $4\frac{5}{8} - 2\frac{7}{8}$

Name _____

Algebra • Fractions and Properties of Addition

Properties of addition can help you group and order addends so you can use mental math to find sums.

The **Commutative Property of Addition** states that when the order of two addends is changed, the sum is the same. $6 + 3 = 3 + 6$

The **Associative Property of Addition** states that when the grouping of addends is changed, the sum is the same. $(3 + 6) + 4 = 3 + (6 + 4)$

Use the properties and mental math to add $10\frac{3}{8} + 4\frac{7}{8} + 6\frac{5}{8}$.

Step 1 Look for fractions that combine to make 1. $10\frac{3}{8} + 4\frac{7}{8} + 6\frac{5}{8}$

Step 2 Use the Commutative Property to order the addends so that the fractions with a sum of 1 are together. $10\frac{3}{8} + 4\frac{7}{8} + 6\frac{5}{8} = 10\frac{3}{8} + 6\frac{5}{8} + 4\frac{7}{8}$

Step 3 Use the Associative Property to group the addends that you can add mentally. $= \left(10\frac{3}{8} + 6\frac{5}{8}\right) + 4\frac{7}{8}$

Step 4 Add the grouped numbers and then add the other mixed number. $= (17) + 4\frac{7}{8}$

Step 5 Write the sum. $= 21\frac{7}{8}$

Use the properties and mental math to find the sum.

1. $\left(3\frac{1}{5} + 1\frac{2}{5}\right) + 4\frac{4}{5}$ _____

2. $\left(5\frac{7}{10} + 1\frac{4}{10}\right) + 6\frac{3}{10}$ _____

3. $7\frac{3}{4} + \left(5 + 3\frac{1}{4}\right)$ _____

4. $\left(2\frac{5}{12} + 3\frac{11}{12}\right) + 1\frac{7}{12}$ _____

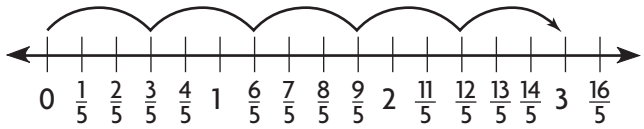
5. $4\frac{7}{8} + \left(6\frac{3}{8} + \frac{1}{8}\right)$ _____

6. $9\frac{2}{6} + \left(4\frac{1}{6} + 7\frac{4}{6}\right)$ _____

Name _____

Problem Solving • Multistep Fraction Problems

Jeff runs $\frac{3}{5}$ mile each day. He wants to know how many days he has to run before the total number of miles he runs is a whole number.

Read the Problem	Solve the Problem
What do I need to find? I need to find how many days Jeff needs to run $\frac{3}{5}$ mile until the total number of miles he runs is a whole number.	**Describe how to act it out.** **Use a number line.**  Day 1: $\frac{3}{5}$ mile Day 2: $\frac{6}{5}$ mile $\frac{3}{5} + \frac{3}{5} = \frac{6}{5}$ 1 whole mile and $\frac{1}{5}$ mile more Day 3: $\frac{9}{5}$ mile $\frac{3}{5} + \frac{3}{5} + \frac{3}{5} = \frac{9}{5}$ 1 whole mile and $\frac{4}{5}$ mile more Day 4: $\frac{12}{5}$ mile $\frac{3}{5} + \frac{3}{5} + \frac{3}{5} + \frac{3}{5} = \frac{12}{5}$ 2 whole miles and $\frac{2}{5}$ mile more Day 5: $\frac{15}{5}$ mile $\frac{3}{5} + \frac{3}{5} + \frac{3}{5} + \frac{3}{5} + \frac{3}{5} = \frac{15}{5}$ 3 whole miles So, Jeff will run 3 miles in 5 days.
What information do I need to use? Jeff runs $\frac{3}{5}$ mile a day. He wants the distance run to be a whole number.	
How will I use the information? I can use a number line and patterns to act out the problem.	

1. Lena runs $\frac{2}{3}$ mile each day. She wants to know how many days she has to run before she has run a whole number of miles.

2. Mack is repackaging $\frac{6}{8}$-pound bags of birdseed into 1-pound bags of birdseed. What is the least number of $\frac{6}{8}$-pound bags of birdseed he needs in order to fill 1-pound bags without leftovers?