Add and Subtract Parts of a Whole

Justin has \( \frac{2}{3} \) pound of cheddar cheese and \( \frac{3}{4} \) pound of brick cheese. How much cheese does he have in all?

**Step 1** Use fraction strips to model the problem. Use three \( \frac{1}{3} \)-strips to represent \( \frac{2}{3} \) pound of cheddar cheese.

**Step 2** Join two more \( \frac{1}{4} \)-strips to represent the amount of brick cheese.

**Step 3** Count the number of \( \frac{1}{4} \)-strips. There are five \( \frac{1}{4} \)-strips. Write the amount as a fraction. Justin has \( \frac{5}{6} \) pound of cheese.

**Step 4** Use the model to write an equation.

Suppose Justin eats \( \frac{1}{6} \) pound of cheese. How much cheese is left?

**Step 1** Use five \( \frac{1}{6} \)-strips to represent the \( \frac{5}{6} \) pound of cheese.

**Step 2** Remove one \( \frac{1}{6} \)-strip to show the amount eaten.

**Step 3** Count the number of \( \frac{1}{6} \)-strips left. There are four \( \frac{1}{6} \)-fraction strips. There is \( \frac{4}{6} \) pound left.

**Step 4** Write an equation for the model.

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 \( \frac{3}{10} \) 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 \( \frac{4}{10} \) clay figures.
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 $= \frac{5}{6} \quad \frac{4}{6} + \frac{1}{6} = \frac{5}{6}$

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 $= \frac{3}{8} \quad \frac{5}{8} - \frac{2}{8} = \frac{3}{8}$
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.

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**Step 2** Think: How many sixths are there in all?
There are 6 sixths.
6 sixths = \( \frac{6}{6} \)

**Step 3** Record it.
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.

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**Step 2** Think: There are 6 tenths. I take away 2 tenths. How many tenths are left?
There are 4 tenths left.
4 tenths = \( \frac{4}{10} \)

**Step 3** Record it.
Write the difference as a subtraction equation.
\( \frac{6}{10} - \frac{2}{10} = \frac{4}{10} \)

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 \( \frac{2}{6} \) 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, \( \frac{25}{6} = \frac{17}{6} \).

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

**Rename \( \frac{5}{9} \) as a mixed number.**

To rename \( \frac{5}{9} \) as a mixed number, divide the numerator by the denominator.
\( \frac{5}{3} \)

Use the quotient and remainder to write a mixed number.
So, \( \frac{15}{3} = 5 \frac{1}{3} \).
4th Grade Chapter 7
“Add and Subtract Fractions” Reteach Lessons 7.1-7.10

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. $4\frac{3}{8} - 3\frac{1}{8}$

Subtract the fraction and the whole number parts.

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

$4\frac{3}{8} - 3\frac{1}{8} = 1\frac{1}{2}$

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

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

Lesson 7.7
Reteach
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** \( \frac{3}{8}, \frac{7}{8}, \frac{6}{8} \).

**Step 1** Look for fractions that combine to make 1.

\[ \frac{3}{8} + \frac{4}{8} + \frac{6}{8} \]

**Step 2** Use the Commutative Property to order the addends so that the fractions with a sum of 1 are together.

\[ \frac{3}{8} + \frac{7}{8} + \frac{6}{8} = \frac{3}{8} + \frac{6}{8} + \frac{7}{8} \]

**Step 3** Use the Associative Property to group the addends that you can add mentally.

\[ (\frac{3}{8} + \frac{6}{8}) + \frac{7}{8} \]

**Step 4** Add the grouped numbers and then add the other mixed number.

\[ - (17) + \frac{7}{8} \]

**Step 5** Write the sum.

\[ -21\frac{7}{8} \]

**Problem Solving • Multistep Fraction Problems**

Jeff runs \( \frac{3}{4} \) mile each day. He wants to know how many days he has to run before he has run a whole number of miles.

<table>
<thead>
<tr>
<th>Read the Problem</th>
<th>Solve the Problem</th>
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<tbody>
<tr>
<td><strong>What do I need to find?</strong></td>
<td>Describe how to act it out. Use a number line.</td>
</tr>
</tbody>
</table>
| I need to find **how many days** Jeff needs to run \( \frac{3}{4} \) mile until he has run a whole number of miles. | \[ \begin{array}{l}
\text{Day 1: } 3 \text{ mile} \\
\text{Day 2: } \frac{3}{5} \text{ mile} + \frac{3}{5} = \frac{6}{5} \\
\text{Day 3: } \frac{3}{5} \text{ mile} + \frac{3}{5} + \frac{3}{5} = \frac{9}{5} \\
\text{Day 4: } \frac{3}{5} \text{ mile} + \frac{3}{5} + \frac{3}{5} = \frac{6}{5} \\
\text{Day 5: } \frac{3}{5} \text{ mile} + \frac{3}{5} + \frac{3}{5} + \frac{3}{5} = \frac{15}{5} \\
\end{array} \] |
| **What information do I need to use?** | |
| Jeff runs \( \frac{3}{4} \) mile a day. He wants the distance run to be a whole number. | 1 whole mile and \( \frac{3}{5} \) mile more |
| **How will I use the information?** | |
| I can use a number line and patterns to act out the problem. | |
| So, Jeff will run a total of \( \frac{3}{5} \) miles in 5 days. | |
