

**Core Focus**

- Subtraction: Making estimates and reviewing the standard algorithm
- Common fractions: Relating whole numbers and exploring equivalence with mixed numbers

**Ideas for Home**

- While shopping, ask your child to estimate the difference in price between two items. Make sure the prices are whole-dollar amounts.

**Subtraction**

- Students estimate differences in costs, then calculate exact solutions using decomposing strategies. Decomposition and other subtraction skills learned in earlier grades are the basis for understanding why the **standard algorithm** works.

**4.1 Subtraction: Making estimates**

**Step In** Felix is planning a vacation.

This sign shows the flight costs to some locations. Estimate the **difference** in cost between a flight to Las Vegas and a flight to Honolulu. How did you form your estimate?

FLIGHT COSTS	
Atlanta	\$167
Honolulu	\$639
Las Vegas	\$198
Palm Springs	\$325

*\$198 is very close to \$200, so I figured out the difference between \$639 and \$200. My estimate is \$439.*

In this lesson, students use estimation strategies to solve subtraction situations.

**Glossary**

- ▶ The **standard algorithm** is the familiar paper-and-pencil procedure for subtracting multi-digit numbers that most adults were taught in school.

**Helpful videos**

View these short one-minute videos to see these ideas in action.

[www.bit.ly/OI\\_29](http://www.bit.ly/OI_29)

[www.bit.ly/OI\\_19](http://www.bit.ly/OI_19)

- Decomposition is another approach to what was once called *borrowing*.

Step 1	Step 2	Step 3																																				
Look at the digits in each place. Can you subtract each place easily?	You need 1 ten to help subtract the ones. Cross out 4 tens and write 3 tens.	Cross out the ones digit and write the new number. 345 is now written as 3 hundreds, 3 tens, and 15 ones.																																				
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You need 1 hundred to help subtract the tens. Cross out 3 hundreds and write 2 hundreds.	Add the 10 tens that you have just regrouped to the 3 tens that you already have. You now have 13 tens. Write the number.	345 is now written as 2 hundreds, 13 tens, and 15 ones. Subtract the ones, tens, then hundreds to find the difference.																																				
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In this lesson, the above problem is solved using the standard subtraction algorithm.

- Subtraction that requires decomposing in multiple places and subtraction where the decomposition involves zero can be more challenging for students.

Common fractions

- In this module, improper fractions are explored using the number line and area models while the length model is used to compare fractions.
- Length models are used to compare common fractions by first considering the size of the unit fractions and how many unit fractions it takes to make one whole.

**4.9 Common fractions: Reviewing equivalent fractions**

**Step In** Look at this fraction chart. The top strip is one whole.

Point to the strip that is divided into two parts. What fraction of that strip is shaded?  
 What parts of other strips can you shade to show the same fraction? How do you know?  
 Write the fractions to complete this sentence.

is equivalent to  is equivalent to  is equivalent to

- Fractions with numerators greater than their denominators ( $\frac{10}{3}$ ) are called **improper fractions**. They can be rewritten as **mixed numbers** ( $\frac{10}{3} = 3\frac{1}{3}$ ). Understanding how to write fractions in each form helps students use them in different operations, like addition or multiplication.
- Students represent specific improper fractions, first with the number-line model and then explore how these new fractions can be represented with an area model.

**4.12 Common fractions: Exploring equivalence with mixed numbers**

**Step In** Ashley says this picture shows  $2\frac{4}{6}$ .  
 Gabriel says it shows  $\frac{16}{6}$ .  
 Who is correct? Why?

A number line can be used to show the position of both amounts.  
 What do you notice about their position?

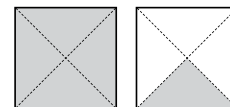
In this lesson, students use area models and number lines to think about fractions that are greater than 1.

Ideas for Home

- When cooking, use measuring cups and spoons to review equivalency:  $\frac{1}{2}$  cup is equivalent to  $\frac{2}{4}$  cup, etc.
- Use a tape measure to compare lengths. E.g. “Is  $\frac{1}{3}$  of a yard longer or shorter than  $\frac{1}{4}$  of a yard?”

Glossary

- ▶ Fractions that are greater than 1 are called **improper fractions**, which can be rewritten as mixed numbers.



This area model shows  $\frac{5}{4}$  (or  $1\frac{1}{4}$  in mixed number form). Despite the name, improper fractions are perfectly acceptable to write and use in mathematics.

- ▶ A **mixed number** is a whole number and a common fraction added together and written as a single number without the addition symbol.

$$2 + \frac{1}{2} \longrightarrow 2\frac{1}{2}$$