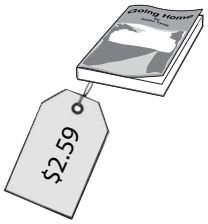
Standard 4.1A; 4.1F; 4.2D (L–M)

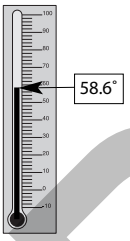
Rounding in Real Life

We round numbers every day. When we share things with our friends, we might estimate how much each person should get. Or, when we buy more than one of the same item, we may estimate how much our total bill will be.

A. Directions: Each item below shows a number that is used in everyday situations. Use information in the pictures and rounding to answer the questions below.

1. 

2. 

3. 

4. 

5. 

1. Is the price closer to $2 or $3? _____
2. Is the weight closer to 10 ounces or 11 ounces? _____
3. Is the temperature closer to 50 degrees or 60 degrees? _____
4. Is the price closer to $15,400 or $15,500? _____
5. Is the weight closer to 2 pounds or 3 pounds? _____

B. Directions: Complete each item below.

6. Jeff has 457 jellybeans in a jar. Round the number of jellybeans in the jar to the nearest hundred.

   _____

7. A concert sold 1,879 tickets. Round the number of tickets sold to the nearest thousand.

   _____

8. The temperature is 79 degrees Fahrenheit. Round the temperature to the nearest ten.

   _____

9. Betty bought a house for $97,862. Round the cost of the house to the nearest thousand.

   _____

10. Jacob collected 274 aluminum cans for the recycling program. Round the number of cans Jacob collected to the nearest hundred. _____

Standard 4.1D; 4.1E; 4.1F; 4.2F (L–M)

Comparing Decimals I

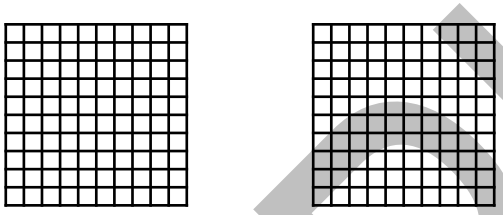
Look at the two decimals below.

0.23 0.32

Talk About It: How can we find out which decimal is greater?

On Your Own

- Shade the decimal grids below to help you compare 0.23 and 0.32.



- Which decimal is greater? _____ Explain your answer on a separate sheet of paper.

Try It: A Houston newspaper recorded the amount of rain that fell during a week-long series of thunderstorms. It published the chart below on the following Sunday. Use the chart below to answer questions 1–4. Draw pictures on a separate sheet of paper to help you.

Day of the Week	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Rainfall in Inches	0.09	0.75	0.66	1.40	0.71	0.10	0.18

1. Which day had the least amount of rain? _____
2. Which day had the greatest amount of rain? _____
3. Which of the following days had the greatest amount of rain: Monday, Tuesday, or Thursday?

   _____
4. List the days in order from least amount of rain to greatest amount of rain.

   _____

What You Need to Know: Sometimes, it's hard to compare two numbers, such as 0.2 and 0.09. The decimal 0.09 may look like the greater number because 9 is greater than 2. Consider the place value of the digits in the numbers. The number 0.2 has 2 tenths, and the number 0.09 has 0 tenths. So, 0.2 must be greater than 0.09. You can also think of 0.2 as 0.20, which is read as "twenty hundredths." Twenty hundredths is greater than nine hundredths.

$0.2 > 0.09$

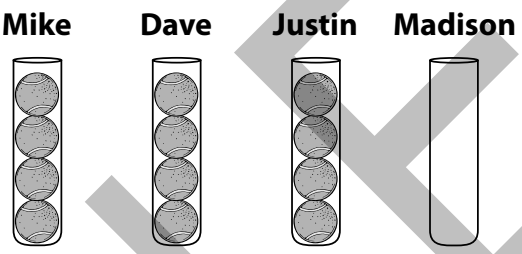
Standard 4.1D; 4.1F; 4.1G; 4.3A; 4.3B (L–M)

Decomposing Fractions II

Example #1

Mike, Dave, and Justin each have a canister of tennis balls. Each canister contains 4 balls, which is the most possible. Each boy gives Madison 1 tennis ball to put into her empty canister.

Talk About It–1: What fraction of a canister does 1 tennis ball represent? _____



On Your Own

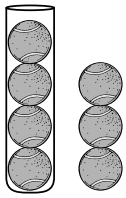
- Circle the tennis balls that each boy gave Madison. Then, draw tennis balls in Madison's canister to represent what she received from Mike, Dave, and Justin.
- What fraction of a full canister did Madison receive? _____

Each tennis ball Madison received is $\frac{1}{4}$ of a full canister. Therefore, the total she received can be written as follows:

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

Example #2

Suppose Madison has a full canister of tennis balls, plus 3 more balls.



Talk About It–2: How could you write this quantity as a fraction?

The correct answer can be written 2 different ways.

$\frac{7}{4}$ Madison has 7 total tennis balls and a canister that holds only 4.

$1\frac{3}{4}$ Madison has 1 full canister and $\frac{3}{4}$ of another full canister.

The first answer is an **improper fraction** (a fraction whose numerator is greater than its denominator). The second answer is a **mixed number** (a whole number and a fraction together).

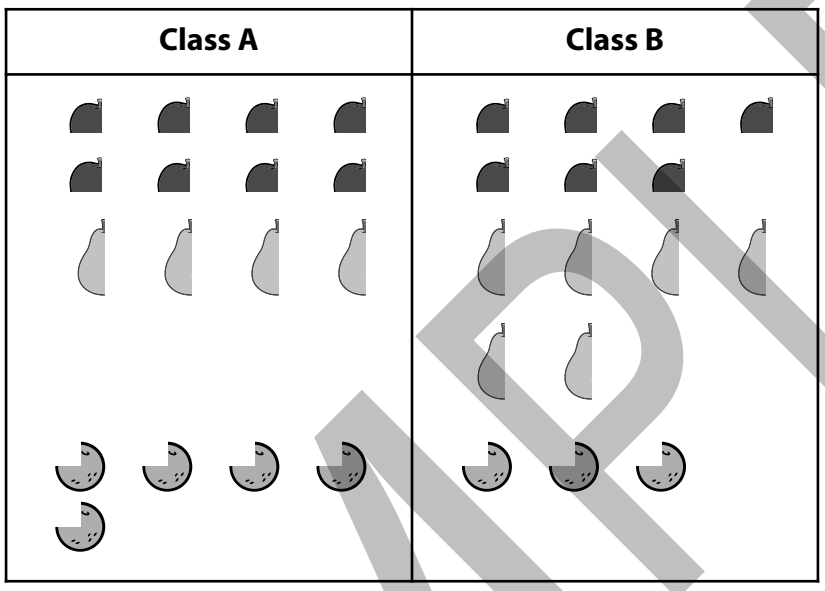
Talk About It–3: How can you convert an improper fraction to a mixed number?

Standard 4.1D; 4.1F; 4.1G; 4.3E (L–M)

Adding & Subtracting Fractions

Adding and subtracting fractions that have the same denominator is easy. You simply add or subtract the numerators and leave the denominators the same. Let's try it.

Lakeview Elementary School tracks how much fruit the students throw in the garbage during lunch. The chart below shows results for a recent afternoon. Review the chart, and answer the questions that follow.



Talk About It: How can you find which class threw away the greater amount of apples?

How much of each apple was found in the garbage? It was $\frac{1}{4}$, right? Class A threw out eight $\frac{1}{4}$-sized pieces of apples.

$$\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=\frac{8}{4}$$

Class B threw out seven $\frac{1}{4}$-sized pieces of apples.

$$\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=\frac{7}{4}$$

If we subtract the two amounts, we know that Class A threw away the greater amount of apples.

$$\frac{8}{4}-\frac{7}{4}=\frac{1}{4}$$

Try It–1

- Which class threw away the greater amount of pears? _____
- Which class threw away the greater amount of oranges? _____

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Standard 4.1E; 4.1F; 4.4G (M)

Rounding & Compatible Numbers

Remember: If you do not need an exact answer for a math problem, you can **estimate** to find the answer. **Rounding** and using **compatible numbers** (numbers that work well together when estimating) are two ways to estimate.

Directions: Solve each problem below. Show your work on a separate sheet of paper. (**Note:** There may be more than one way to solve some problems.)

1. Look at the numbers in the box below. Which two numbers can you add to come close to a sum of 400?

389	110	79	315	167	421	84

2. Look at the numbers in the box below. Which two numbers can you multiply to come close to a product of 240?

24	18	6	200	4	32	38

3. Look at the numbers in the box below. Which two numbers can you divide to come close to a quotient of 60?

354	4	6	615	12	9	42

4. Look at the numbers in the box below. Which two numbers can you subtract to come close to a difference of 100?

486	294	4	378	24	412	19

5. Look at the numbers in the box below. Which two numbers can you add to come close to a sum of 1,000?

330	796	5	692	18	193	64

6. Look at the numbers in the box below. Which two numbers can you multiply to come close to a product of 160?

2	176	8	320	34	340	18

Standard 4.1A; 4.1D; 4.1F; 4.1G; 4.5D (L–M)

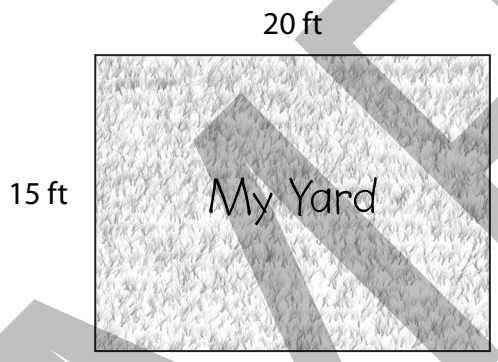
Learning About Perimeter

You measure length and distance for many different reasons. You might measure something simply to know its length. Or you might measure distance to know how far you have traveled.

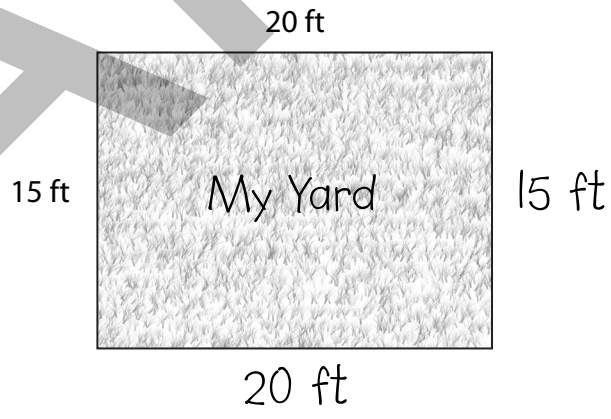
Sometimes you need to know the total distance around something, like a yard or a room.

In Greek, the word *peri* means "around," and the word *metron* means "measure." The English word **perimeter** comes from those two Greek words. **Perimeter** is the measured distance around a shape. In everyday life, you might measure perimeter for many different purposes. Look at the example below.

Imagine you want to build a fence around your yard. To build the fence, you need to know the total distance around the yard. In other words, you need to know the yard's **perimeter**. The diagram below shows the length and width of the yard.



The yard shown in the diagram is a rectangle. For this reason, you know that if one side is 20 feet long, then the opposite side is also 20 feet long. You also know that if one side measures 15 feet, then the opposite side measures 15 feet.



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Standard 4.1D; 4.1F; 4.1G; 4.6C (M)

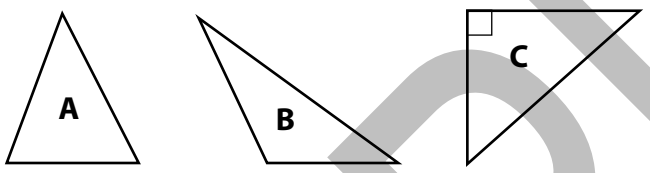
Types of Triangles

You can classify triangles using two different sets of characteristics: angle size and side length. Let's look at angle size first.

Triangles by Angle Size

You have already learned about acute (less than 90°), obtuse (more than 90°), and right (exactly 90°) angles. You can use these same terms to describe triangles.

On Your Own: Look at the triangles below. Use what you know about angles to fill in the blanks.



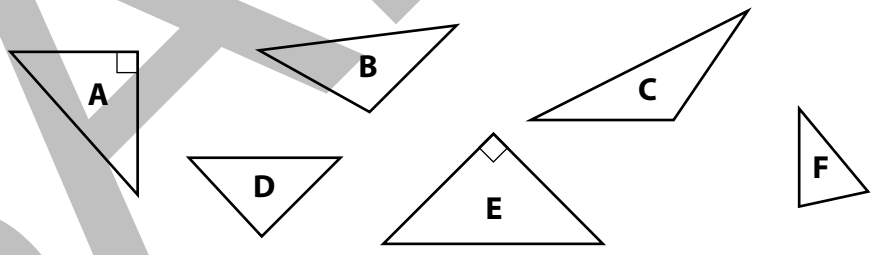
Triangle A is a(n) _____ triangle because all of its angles are _____ 90 degrees.

Triangle B is a(n) _____ triangle because 1 of its angles is _____ 90 degrees.

Triangle C is a(n) _____ triangle because 1 of its angles is _____ 90 degrees.

Talk About It–1

- Would you classify the triangles below as acute, obtuse, or right? Explain your reasoning.



- Can a right triangle ever have more than one 90-degree angle? Why or why not?
- Can an obtuse triangle ever have more than 1 obtuse angle? Why or why not?
- Do all 3 angles in an acute triangle need to be less than 90 degrees? Why or why not?

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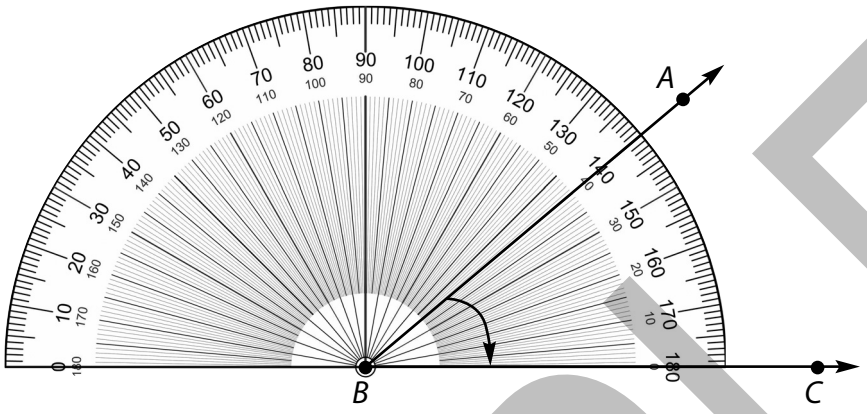
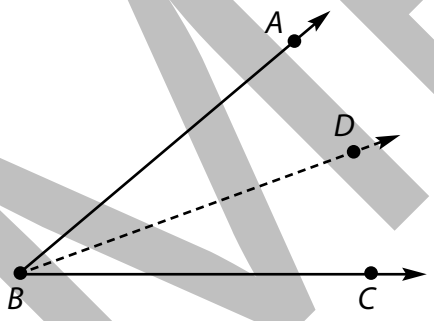
Standard 4.1D; 4.1E; 4.1F; 4.1G; 4.7E (L–M)

Decomposing Angles

The diagram below shows $\angle ABC$.



In the diagram above, $\angle ABC$ measures 40°. A 40-degree angle is actually 40 one-degree angles. For this reason, you can easily **decompose** (break apart) an angle into smaller angles. Look at the example below.



Another ray, $\overrightarrow{BD}$, has been added to the diagram. $\overrightarrow{BD}$ was drawn through the exact center of $\angle ABC$. Adding this new ray also created two new angles.

Talk About It–1

- What new angles were created?
- What is the measure of each new angle?
- How do you know the measure of each new angle?
- What can you conclude about the two new angles?
- How can you express your conclusion with an equation?

On Your Own–1: On a separate sheet of paper, explain the equation below in your own words.

$$\angle ABD + \angle DBC = \angle ABC$$

continue to next page

Standard 4.1D; 4.1F; 4.1G; 4.9A (L–M)

Introducing Stem-and-Leaf Plots

A **stem-and-leaf plot** is a type of graph that summarizes data by separating each data point by place value. The "stem" can be the digit in the tens place, and the "leaf" can be the digit in the ones place. For example, the number 58 would be separated into a stem of 5 and a leaf of 8. The stems are written in the first column, and the leaves are written in the second column.

The stem-and-leaf plot below shows the number of points players on a basketball team scored in a season. The players scored 8, 10, 12, 12, 16, 19, 22, 25, 31, 34, 38, and 39 points.

Points Scored by a Basketball Team

Stem	Leaf
0	8
1	0 2 2 6 9
2	2 5
3	1 4 8 9

Talk About It–1

- Why is the stem in the first row 0?
- Why are the stems 0, 1, 2, and 3?
- Why are there two 2s in the second row?
- Why would it be important to arrange data in order from least to greatest before making a stem-and-leaf plot?

Stem-and-leaf plots can also show data written as decimals or fractions. These stem-and-leaf plots usually include a **key** showing how each data point is separated. Usually, when data includes mixed numbers, the whole number is the stem and the fraction is the leaf. When data includes decimal numbers, the number to the left of the decimal point is the stem and the number to the right of the decimal point is the leaf. The stem-and-leaf plots below show data written as decimals and fractions.

Weights of Water Bottles

Stem	Leaf
6	1 2 8
7	2 8
8	5 5 7 9
9	3 4

Key: 6 | 1 = 6.1 ounces

Lengths of Scrap Paper

Stem	Leaf
1	$\frac{1}{2}$ $\frac{3}{4}$
2	$\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{3}{4}$
3	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

Key: 1 | $\frac{1}{2}$ = 1 $\frac{1}{2}$ inches

Talk About It–2

- In the stem-and-leaf plot on the left, what would a stem of 0 and a leaf of 9 represent? What would a stem of 9 and a leaf of 0 represent?
- In the stem-and-leaf plot on the right, what would a stem of 0 and a leaf of $\frac{3}{4}$ represent? What would a stem of 1 and a leaf of 0 represent?

Standard 4.1A; 4.1F; 4.1G; 4.10B (M)

What is profit?

Where do stores get the things they sell? Stores buy the items from suppliers and manufacturers. Stores then resell the items for more money than the stores paid for the items. **Profit** is the amount of money a business earns after its costs and expenses are paid. Profit is the difference between **revenue** (the amount of money earned) and **expenses** (the amount of money spent). To find profit, you subtract the total expenses from the total revenue.

Profit = Revenue – Expenses

Read the word problem below, and think about how you would solve it.

> Maryann washed cars in her neighborhood to earn money. She washed 3 cars for $5 each and 1 truck for $8. She spent $2 on sponges and $3 on cleaner. How much profit did Maryann earn washing cars?

Talk About It

- Which numbers in the problem represent revenue?
- Which numbers in the problem represent expenses?
- How can you calculate Maryann's profit?

On Your Own: Calculate Maryann's profit. Show all of your work on a separate sheet of paper.

Try It: Read the word problem below. Then, complete the items that follow.

> Tommy made and sold picture frames to raise money for his scout troop. He sold small picture frames for $4 and large picture frames for $7. Tommy bought wood and nails at a hardware store for $9. He used the materials to make 6 small picture frames, all of which he sold. Then, Tommy spent another $8 on supplies to make 2 more small picture frames and 1 large picture frame. He sold the large picture frame and 1 of the small picture frames.

1. What was Tommy's total revenue? _____
2. What were Tommy's total expenses? _____
3. What was Tommy's total profit? _____