



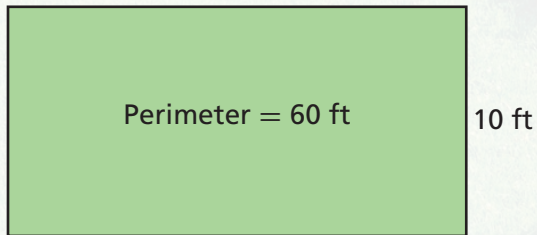
# Seventh Grade Math

# Apply Two-Step Equations to Solve Real-World Problems

**I Can** use two-step equations to solve a variety of problems.

## Spark Your Learning

A diagram of the rectangular sitting area in a botanical garden is shown. What is the length of the sitting area in the garden?



**Turn and Talk** How else could you have represented the situation with the garden?

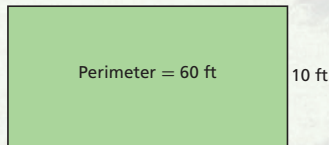
## Apply Two-Step Equations to Solve Real-World Problems

**I Can** use two-step equations to solve a variety of problems.

### Spark Your Learning



A diagram of the rectangular sitting area in a botanical garden is shown. What is the length of the sitting area in the garden?



#### Sample Answer:

Perimeter is the sum of all sides, and the perimeter of a rectangle is  $2w + 2\ell$ . I know the width is 10. If I add the 2 widths together, I get 20. I subtract the widths from the perimeter:  $60 - 20 = 40$ . 40 is the amount left for 2 lengths. Divide 40 by 2 to get 20 feet for the length.



© Houghton Mifflin Harcourt Publishing Company • Image Credit: ©Corbis



**Turn and Talk** How else could you have represented the situation with the garden? See possible answer at the right.

## 1 Spark Your Learning

### MOTIVATE

Introduce the problem. **Ask students:** Do you know what a botanical garden is? Have you ever visited one? Where was it? Do you remember any of the plants you saw? Tell students to discuss and share with their team members in a small group.



### SUPPORT SENSE-MAKING Three Reads

Have students read the problem three times. Use the questions in the Three Reads box below for a different focus each time.

### PERSEVERE

If students need support, guide them by asking:

- Q Assessing** What information is given? *that the sitting area is shaped like a rectangle, the perimeter of the rectangle measures 60 feet, and its width is 10 feet*
- Q Assessing** What are you being asked to find? *Possible answer: The problem is asking me to find the length of the sitting area (or rectangle).*
- Q Advancing • Use Tools** Which tool could you use to solve the problem? Why is this tool more strategic? *Students' choices of strategies and tools will vary.*
- Q Advancing** What is the formula for finding the perimeter of a rectangle? *The formula for the perimeter of a rectangle is  $P = 2\ell + 2w$ .*
- Q Advancing** If you substitute the given values into the formula, what is the result? *It is  $60 = 2\ell + 2(10)$ .*



**Turn and Talk** Encourage students to share their work. Discuss how the formula for the perimeter of a rectangle can help them check their solutions. *Possible answer: I used the formula for perimeter, which is 2 times the length plus 2 times the width. I put in the numbers given and made a guess for the length which was unknown.*

$$\begin{aligned} 2(20) + 2(10) &= 60 \\ 40 + 20 &= 60 \\ 60 &= 60 \end{aligned}$$



## SUPPORT SENSE-MAKING: Three Reads

Tell students to read the question stem three times and prompt them with a different question each time.

- 1** What is this situation about?  
*Possible answer: a rectangular sitting area, for which I know the perimeter and the width*
- 2** What are the quantities in the situation?  
*Possible answer: The perimeter is 60 feet, and the width is 10 feet.*
- 3** What are possible mathematical questions that you could ask for the situation?  
*Possible questions: What is the length of the sitting area? What is the area of the sitting area?*

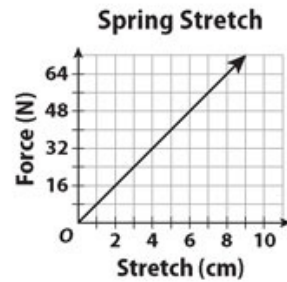
### BUILD SHARED UNDERSTANDING

Select students who used various strategies and tools to share with the class how they solved the problem. Have students discuss why they chose a specific strategy or tool.

## Performance Tasks

### 1. CAREERS IN MATH Mechanical Engineer

A mechanical engineer is testing the amount of force needed to make a spring stretch by a given amount. The force  $y$  is measured in units called *Newtons*, abbreviated N. The stretch  $x$  is measured in centimeters. Her results are shown in the graph.



- a. Write an equation for the line. Explain, using the graph and then using the equation, why the relationship is proportional.

---



---



---

- b. Identify the rate of change and the constant of proportionality.

---

- c. What is the meaning of the constant of proportionality in the context of the problem?

---



---



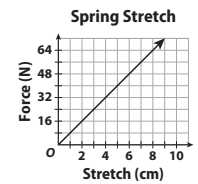
---

- d. The engineer applies a force of 41.6 Newtons to the spring. Write and solve an equation to find the corresponding stretch in the spring.

---

## Unit 3 Performance Tasks

1. **CAREERS IN MATH** **Mechanical Engineer** A mechanical engineer is testing the amount of force needed to make a spring stretch by a given amount. The force  $y$  is measured in units called *Newtons*, abbreviated N. The stretch  $x$  is measured in centimeters. Her results are shown in the graph.



- a. Write an equation for the line. Explain, using the graph and then using the equation, why the relationship is proportional.

$y = 8x$ ; The graph is a straight line through the origin; the equation is of the form  $y = kx$ , where  $k \neq 0$ .

- b. Identify the rate of change and the constant of proportionality.

8 N/cm; 8

- c. What is the meaning of the constant of proportionality in the context of the problem?

Every centimeter of stretch of the spring requires 8 Newtons of force.

- d. The engineer applies a force of 41.6 Newtons to the spring. Write and solve an equation to find the corresponding stretch in the spring.

$41.6 = 8x$ ;  $x = 5.2$  in.



# Seventh Grade Social Studies



## 7th Grade Social Studies Task

### Scientific Revolution:

#### The People, Theories, and Inventions That Changed the World.

\*There will be a short video lesson of a Knox County teacher to accompany this task available on the KCS YouTube Channel and KCS TV.

#### Standards:

7.50 Compare and contrast heliocentric and geocentric theories of the Greeks (geocentric), Copernicus (heliocentric), and Kepler (elliptical orbits).

7.51 Examine Galileo Galilei's theories and improvement of scientific tools, including the telescope and microscope.

7.52 Explain the significance of the following in regards to the Scientific Revolution: Sir Francis Bacon in establishing the scientific method and Sir Isaac Newton's three Laws of Motion.

#### Task:

1. Review answers to last week's foldable from the video available on KCS TV or the KCS YouTube page
2. Complete the questions below to review last week's lesson.

#### Review Questions: The Scientific Revolution

1. Write a paragraph using evidence from the Scientific Revolution reading from last week explaining which scientist (Galileo, Bacon, Copernicus, Newton, or Kepler) you think made the greatest contribution to the Scientific Revolution.

---

---

---

---

---

---

2. Write a paragraph using evidence from the Scientific Revolution reading from last week explaining which scientific theory (Newton's laws of motion, Kepler's elliptical theory, Ptolemy Geocentric Model of the Universe, Copernicus' Heliocentric Model of the Universe, or Bacon's scientific method) you think most influenced the growth of the scientific revolution.

---

---

---

---

---

---



# Seventh Grade

## ELA



**Monday: Search for the film *The Myth of Choice: How Junk-Food Marketers Target Our Kids*. Watch it for free on [realfoodmedia.org](http://realfoodmedia.org).**

## Learning Targets

- Analyze a film to establish its purpose and assess its credibility.
- Identify and gather relevant research information about a film.

**Tuesday: Watch the film again, and complete this organizer.**

<b>Role</b> Who created this film?	Response: Evidence:
<b>Audience</b> Who do you think it was created for?	Response: Evidence:
<b>Format</b> What type of film is it? Is the film a primary or secondary source?	Response: Evidence:
<b>Topic</b> What is its purpose?	Response: Evidence:

**Thursday: Personally react to what you learned in the film.**

Evidence from the Film	Personal Response I have experienced . . . This reminds me of . . .
Food companies tell us they're just doing their job.	
"Still, I can just say no, right?"	
"The food industry has spent millions"	

**Wednesday: Complete the Sentence Expansion Activity.**

## Sentence Expansion Activity.

Expand your ideas from the graphic organizer by adding **but**, **because**, and **so**.

1. The film was created by \_\_\_\_\_, **but/because/so**
2. The film was created for \_\_\_\_\_, **but/because/so**
3. The film is a \_\_\_\_\_ source, **because/so**
4. The purpose of this film is \_\_\_\_\_, **but/because/so**

**Friday: On a separate piece of paper, answer questions 1-4.**

1. What additional information did you find interesting?
2. What is one other question the film prompted you to think about?
3. Respond to the essential question: What role does advertising play in the lives of youth? Think about how advertisers attempt to influence consumers.
4. From what you can tell, how reliable is this source?

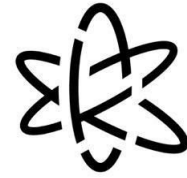
**KCS  home**

# **Seventh Grade Science**

Week of May 11, 2020  
[knoxschools.org/kcsathome](https://knoxschools.org/kcsathome)

# 7<sup>th</sup> Grade Science: Week 6, May 11

## What materials will pass through a semipermeable membrane?

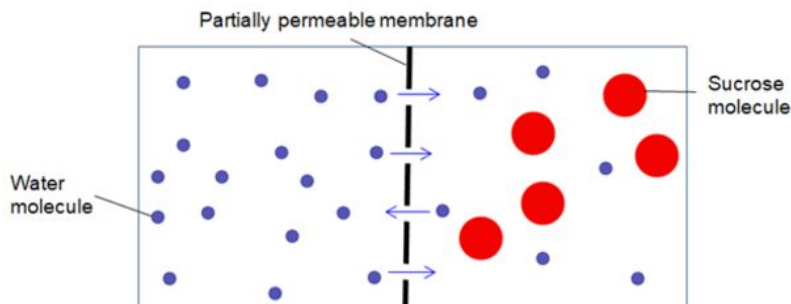


**Directions:** This handout goes with a KCS Teacher Video. If you have access to the video, watch the video before doing this activity. You can find the videos here <https://www.knoxschools.org/Page/21816>

### Passive Transport Key Points:

- **Homeostasis** refers to stability or balance within a system.
- The **cell membrane** is an organelle that acts like a gatekeeper for the cell, allowing materials to pass in and out of the cell, in order to maintain balance.
- The cell membrane is “**semipermeable**” meaning it only allows certain molecules to pass through it. Semipermeable is the same as partially permeable, shown in Figure 1.
- Smaller molecules are able to pass in and out of the cell freely, while larger molecules cannot pass in and out of the cell.

Figure 1



In figure 1, which molecules are able to pass through the cell membrane freely?

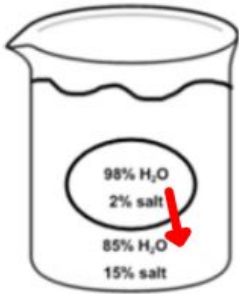
In figure 1, which molecules cannot pass through the cell membrane freely?

### What Causes the Molecules to Move?

- Molecules of liquids and gases tend to spread out in order to be evenly distributed. These molecules always move from where they are in **high concentration** to areas of **low concentration**, until they reach **equilibrium**.
- **Diffusion** is when liquids or gases spread out, moving from areas of high concentration to low concentration of molecules until equilibrium is reached.
- **Osmosis** is the diffusion, or spreading out of water, from a high concentration to a low concentration of molecules until equilibrium is reached.

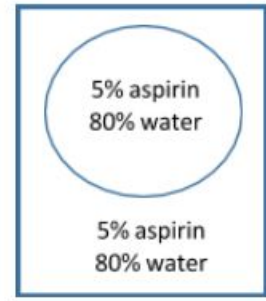
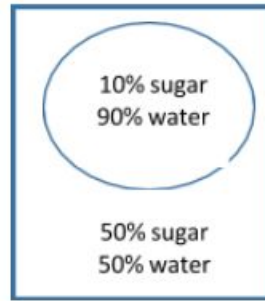
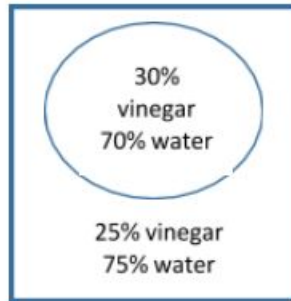


**EXAMPLE:**



The water inside the cell has a higher concentration than the water outside of the cell. The water moves from high concentration to low concentration, outside of the cell.

**Practice:** Draw an arrow to demonstrate how the molecules of each substance will move through Osmosis. Remember: Look at the concentrations of WATER to determine High and Low concentration.



**Task 1- Raisin Osmosis:** Conduct an investigation to demonstrate the movement of water through a semipermeable membrane.

**Investigation Materials:** 3 Raisins, water, small cup (*alternative to raisins are gummy bears*)

**Procedures:**

1. Complete the “Before” Observation table.
2. Fill the small cup with water.
3. Place the raisins in the cup.
4. Make observations about your raisins 2-3 times during the day as you wait. (Complete the “During” Observation table.)
5. After 24 hours, remove raisins and complete the “After” observations.
6. Compare your “Before” and “During” observations with your “After” observations.

**Before Observation:** Draw what your raisins look like before you put them in the water.

Write a sentence describing your observations:

**During Observation:** Draw what your raisins look like at 2-3 different times throughout the day:

1st Check-in

2nd Check-in

3rd Check-in

**After Observation:** Draw what your raisins look like after 24 hours.

Write a sentence describing your observations:

**Analysis:**

1. How did the shape of the raisin change from the beginning to the end of the investigation?
2. What caused the change?
3. The picture to the right shows the raisin placed in the cup BEFORE any movement of water. **Label** the following on the cup:
  - High concentration of water
  - Low concentration of water
  - Arrow demonstrating the movement of water over 24 hours
4. At what point does the raisin's shape stop changing?
5. What process did you model in this investigation? (Refer back to your vocabulary if needed!)



**Task 2: Extension Activity- Eggmosis** (<https://tinyurl.com/ya85j2t2>)

**Essential Question: What will happen to the size of an egg when placed in different solutions?**

**Materials:** 2 eggs, vinegar, water, Karo syrup (or pancake syrup), 2 cups, string

**Prep:** To prepare your eggs for the demonstration, you will need to soak them in vinegar for 24-48 hours until the shell has completely come off. Once the shell is dissolved, the cell membrane of the egg is exposed. The egg will feel “bouncy” but is still breakable so be careful!

**Egg Background:** Egg whites are 90% water and 10% protein. Water can move in and out of a cell membrane easily but protein cannot.

**Procedures:**

1. Place the shell-less eggs in each cup. Make observations about their appearances and draw a picture of one of the eggs in box 1 on the next page.
2. Using a piece of string, measure the “waist” or circumference of the egg and record.
3. Pour Karo syrup (or pancake syrup if that's all you have) over one egg in one cup. Completely cover the egg with syrup.
4. Pour water over the other egg in the other cup. Completely cover the egg with water.
5. Leave alone for 12-24 hours.
6. After time has passed, carefully take each egg out of the solutions and place on a plate.

7. Observe their appearances, and draw each in boxes 2 and 3 below.
8. Using a piece of string, measure the “waist” or circumference of each egg and record.

1. Shell-less Egg	2. Egg in Syrup	3. Egg in Water
Circumference:	Circumference:	Circumference:

**Analysis:**

*\*\*Remember: Eggs are made of water and protein. Water can move through a semipermeable membrane but proteins cannot.*

6. How did the shape of the egg change in the **syrup**?
7. What caused the change?
8. In the cup to the right, draw the egg. Then, demonstrate the movement of water after the egg was in the **syrup**.



**Label** the following on the cup:

- High concentration of water
- Low concentration of water
- Arrow demonstrating the movement of water over 24 hours

9. How did the shape of the egg change in the **water**?
10. What caused the change?
11. In the cup to the right, draw the egg. Then, demonstrate the movement of water after the egg was in the **water**.



**Label** the following on the cup:

- High concentration of water
- Low concentration of water
- Arrow demonstrating the movement of water over 24 hours