

# PowerPlay

POST-VISIT

## Serving Sizes

# 10

Students will estimate serving sizes of different foods and compare their estimates to serving size information provided on food package nutrition labels.

TIME

15 minutes  
for set-up; 45  
minutes to  
conduct the  
activity

### MATERIALS

#### TEACHER

- 3 large containers of dry sample foods
- 2-liter bottle of regular soft drink
- 2 identical packages of each of the following: frozen peas, dry breakfast cereal, popped popcorn

**Note:** Remove the Nutrition Facts labels from all the food items. Create a "Nutrition Facts Labels" page by pasting all of the labels onto a sheet of paper (eliminate duplicate labels).

#### TEXAS ESSENTIAL KNOWLEDGE AND SKILLS (TEKS) OBJECTIVES

##### SCIENCE

3.2.A-F; 4.2.A-F; 5.2.A-F

Student uses scientific inquiry methods during laboratory and outdoor investigations by collecting data, constructing charts and graphs, analyzing and interpreting patterns in data, repeating investigations for more reliability and communicating conclusions.

3.4.A; 4.4.A; 5.4.A

Students know how to use a variety of tools, materials, equipment, and models to conduct science inquiry.

##### HEALTH

3.1.A; 4.1.F; 5.1.E

Students will recognize and explain ways to enhance and maintain health and recognize and perform behaviors that reduce health risk throughout their lifespan.

#### PER GROUP OF FOUR STUDENTS

- 6 paper plates (for dry foods)
- 2 large cups or containers (for liquids)
- 2 measuring cups (one for solids, one for liquids)
- Permanent marker
- Prepared copy of "Nutrition Facts Labels" (see "Note" above)
- Copy of "What is a Serving Size?" sheet
- 4 copies of "Estimates and Labels"

The Children's Museum of Houston's PowerPlay exhibit is designed to help young people discover new ways to be physically

active, and also to reinforce healthy behaviors. Healthy food choices are important to both objectives. Food labels and other guides often use "serving size" to describe a recommended single portion of a food. However, serving sizes vary among different kinds of foods (liquid versus solid food, and cooked versus raw food).

Frequently, the serving size listed on a food Nutrition Facts label—and the portion size actually eaten—are larger than the serving sizes suggested by other guides to healthy eating, such as the USDA Food Pyramid. Serving sizes provided on food labels are designed to make it easier for consumers to compare the calorie, carbohydrate and fat content of similar products, and to identify the nutrients present in a food. Used appropriately, food labels can help us to make better food choices.

### E N G A G E

1. Ask students, *What is a serving size?* Use their answers to guide the class into a discussion of food portions.
2. Explain that food portions usually are measured in terms of "cups," pieces or other units. Show students the measuring cups they will use to measure dry and liquid foods. Point out that each unit commonly used in cooking can be translated into standard international (metric) units, such as liters or grams.

### E X P L O R E

1. After discussing food portions and serving sizes, challenge students to predict the serving sizes for the liquid and solid foods that you provide.
2. Have one student from each group pick up the materials for his or her group. Give each group a copy of the



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- "What is a Serving Size?" sheet. Have students follow the instructions on their activity sheets to label their plates and cups, and then predict appropriate portion sizes for each of the four foods.
3. After students have recorded their estimates, allow each group to measure out and place the corresponding amount of each food into the cup or onto a plate labeled "Estimate."
  4. Give each group a copy of the "Nutrition Facts Labels" page.
  5. Help students find the manufacturer's suggested serving size on each food label. Then, have students measure out and place one serving of each food (as indicated on the label) into the cup or onto a plate marked "Food Label." Have students observe and compare the amounts they estimated to be one serving size with the amounts actually listed on the food labels.

## EXPLAIN

1. Allow each group to share its findings with the rest of the class.
2. Distribute a copy of the "Estimates and Labels" sheet to each student.
3. Help students find other relevant information on the Nutrition Facts labels, such as details for diets with different caloric needs, and amounts of important nutrients in the food.
4. Point out the "Quick Hand Measures" of portion sizes shown on the sheet. Ask, *Do you think food labels can help you make better decisions about what and how much to eat?*

## ELABORATE

To learn about "hidden sugar" in different foods and drinks, have students compare the amounts of sugar listed on the

nutritional labels of fruit juices, soft drinks, cookies, cereal, baked goods and other foods (4g of sugar = 1 tsp).

## EVALUATE

1. Ask students to bring in all types of food labels over the next week.
2. Provide an assortment of labels to each group. Using the labels provided, have each group identify the food that fits each of the following categories.
  - Most fat per serving
  - Least fat per serving
  - Most calories per serving
  - Least calories per serving
  - Most protein per serving
  - Least protein per serving
  - Most carbohydrates per serving
  - Least carbohydrates per serving
  - Most sugar per serving
  - Least sugar per serving
3. Discuss the results as a class.

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The activities described herein are intended for school-age children under direct supervision of adults. The authors, Baylor College of Medicine, the Children's Museum of Houston and funders cannot be responsible for any accidents or injuries that may result from conduct of the activities, from not specifically following directions, or from ignoring cautions contained in the text.

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PARTNERSHIP AWARD  
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For more information about PowerPlay and additional classroom activities on other topics, please visit [www.bioedonline.org](http://www.bioedonline.org).



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## WHAT IS A SERVING SIZE?

Have you ever wondered what the appropriate serving sizes are for different foods? In this activity, you will investigate the serving sizes for the foods displayed in your classroom. To get started, you will need six plates and two cups. Label three of the plates and one cup as "Estimate." Mark the remaining three plates and one cup as "Food Label."

### Serving Sizes: Estimates

1. Write the name of each food under the "Food Name" column on Table 1.
2. For each food, estimate how many cups (or fractions of cups) make up one serving. Record your estimates on the table.
3. Take the plates and cup labeled "Estimate" to the station where the foods are displayed. Also bring this sheet with your serving size estimates. Measure out what you estimated as one serving size of each food onto a plate or into the cup.

**Table 1. Estimates**

Food Name	Estimate one serving of this food. Use cups as a measure.

### Serving Sizes: Nutrition Fact Labels

1. Look at your copy of the food Nutrition Facts labels. Write the name of each food under the Food Name column on Table 2.
2. Find the serving size recommendations on each Nutrition Facts label. Write that serving size for each food in the appropriate space on Table 2.

**Table 2. Nutrition Facts Label Recommended Serving Size**

Food Name	Nutrition Facts label serving size. Use cups as a measure.

### Serving Sizes: Measurements

1. Take the plates and cup marked "Food Label" to the food station. Measure out the appropriate amount of each food, based on its Nutrition Facts label. Put each portion on a plate or in the cup.
2. Compare the amount of food in your initial serving size estimates to the serving sizes recommended by the Nutrition Facts labels. Describe any differences on the back of this sheet.
3. Based on the information you collected in this investigation, why do you think it might be important to look at the serving sizes listed on food labels? Record your answer on the back of this sheet.



## ESTIMATES AND LABELS

Serving sizes often are smaller than the portions we actually eat.

Look for low levels of saturated, hydrogenated and trans fats. These are unhealthy.

Cholesterol is found in foods of animal origin.

Look for foods that have more carbohydrates as fiber and fewer as sugar. Only foods from plants provide fiber.

Protein is important for muscles and growth.  
It is found in animal and plant foods.

Vitamins and minerals are essential for health.  
Calcium is important for bones and teeth.

Use this section as a guide for daily planning. The amount of calories needed by each person depends on many factors, including exercise. Foods with high amounts of saturated fats or sugars may not be the best choices.

### Refried Beans Fat Free

#### Nutrition Facts

Serving Size 1/2 cup (125g)  
Serving Per Container 3.5

##### Amount Per Serving

**Calories** 130      Calories from Fat 0

##### % Daily Value\*

<b>Total Fat</b> 0g	<b>0%</b>
Saturated Fat 0g	
Trans Fat 0g	<b>0%</b>
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 490mg	<b>20%</b>
<b>Total Carbohydrate</b> 24g	<b>8%</b>
Dietary Fiber 7g	<b>28%</b>
Sugars 0g	<b>0%</b>
<b>Protein</b> 9g	<b>16%</b>
Vitamin A	<b>0%</b>
Vitamin C	<b>0%</b>
Calcium	<b>6%</b>
Iron	<b>15%</b>

\* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories: 2,000	2,500
Total Fat	Less than 65g	80g
Sat Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g

### Quick Hand Measures

Use the Quick Hand Measures to estimate the size of one serving of different foods.



A closed fist



=  
Piece of fruit or  
cup of raw vegetables



Two fingers



=  
Ounce of  
cheese



A cupped hand



=  
Cup of  
dry cereal



An open palm



=  
Single serving  
of meat



=  
Tip of thumb



=  
Teaspoon of  
butter

# Teacher Tips

Follow these guidelines when your students visit the PowerPlay exhibit at the Children's Museum of Houston (CMH).

- Students must wear tennis shoes.
- The CMH's PowerPlay exhibit is on three levels, connected by the Power Tower. Level 2 of the Power Tower is on the main entry level of the Museum. It is suggested that teachers have a chaperone on each level of the Power Tower or have a chaperone accompany each group.
- An elevator for handicapped children is available (CMH guide will have key). It is suggested that you inform CMH officials about any special needs your students may have before you arrive at the museum.
- Before your visit, help students understand the difference between heart rate while resting and after exertion, (see "Activity 3. Heart Rate and Exercise").
- Also before your visit, explain to

students that they will rate (on a 1–10 scale) the amount of effort they expend during some of the activities in the exhibit. This is known as "perceived exertion rate."

- Ask the CMH guide for a "Kid Card" (Power Tracker) for each student. To set up a card, each student will need the information below before visiting the Museum (see "Kid Card" video). Please make sure your students are ready to enter the following information (or have a chaperone assist).

Username (numbers and letters only)  
Password  
Male or female  
Birthday (numerical date)  
E-mail (optional)

As a final step, have students measure their baseline heart rates.

## IDEAS FOR TEACHERS WITHOUT ACCESS TO THE CHILDREN'S MUSEUM OF HOUSTON

- Incorporate any of the lessons into your regular curriculum.
- Plan a special "field day" at your school. Prior to the event, conduct the Pre-visit lessons. After the event, use the Post-visit lessons.
- Create a classroom fitness plan that provides one month of activities. Help students plan a calendar with different fitness activities for each day.
- Participate in the President's Challenge for fitness ([www.presidentschallenge.org](http://www.presidentschallenge.org)).

# Exhibit Key

	Cardiovascular	Strength	Flexibility	Balance
<b>Power Tower:</b> Climb, leap and jump in a 3-story climbing structure that takes you to other parts of PowerPlay.				
<b>Dance Mania:</b> Listen to music and follow along with different dance moves. Record your heart rate after you play.				
<b>Match My Moves:</b> Capture images of your own body in action and follow the poses you've set through a sequence of quick movements, testing your endurance and raising your heart rate.				
<b>Light Chase:</b> Race around an interactive game board, while increasing your speed and raising your heart rate.				
<b>Jump It Up:</b> Get your heart pumping as you jump over a glowing, virtual rope, which gets faster and faster the more you jump!				
<b>Blast Off:</b> Crank hand pedals as fast as you can to race flying superheroes across the exhibit.				
<b>Adventure Course:</b> Run through a course of climbing and crawling activities along padded, sloping surfaces! Slap each hand whacker along the way and record the level you achieve.				
<b>Mt. Boulder:</b> Face three challenges on a climbing wall and measure how far you've climbed, your grip strength, reach, flexibility and coordination.				
<b>Grip It:</b> Measure your grip strength and record this measurement using your Kid Card.				
<b>Power Course:</b> Grab a scooter and use your upper body strength to push or pull yourself along this wheelchair accessible course.				

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**TEACHER RESOURCES FROM THE CENTER FOR EDUCATIONAL OUTREACH  
AT BAYLOR COLLEGE OF MEDICINE**



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