



What is a serving size?

Background

Food labels and other guides often use “serving size” to describe a recommended single portion of food. Serving sizes are different for various kinds of food (liquid versus solid foods and cooked versus raw foods). In many cases, the amount specified as a “serving size” for a particular food is smaller than the amount typically eaten.

Frequently, the serving sizes listed on “Nutrition Facts” labels of food packages are larger than the serving sizes listed by other guides to healthy eating, such as the Food Pyramid (insert diagram of Food Pyramid). Serving sizes listed on food labels are designed to make it easier to compare the calorie, carbohydrate, and fat content of similar products and to identify nutrients present in a food. Used appropriately, the information on food labels can help consumers make better food choices.

This activity introduces students to solid and liquid measures and to the concept of “serving size.”

Instructional Objectives

The student will

- Estimate serving sizes of different foods and compare their estimates to serving size information provided on “Nutrition Facts” food labels.

National Standards

NCTM Mathematics Standards

Number and Operations

- Compute fluently and make reasonable estimates

NSTA Science Standards

Science as Inquiry

- Abilities necessary to do scientific inquiry

Science in Personal and Social Perspectives

- Personal Health

National Health Education Standards

Health Information, Products and Services

- Analyze the validity of health information, products, and services.
- Demonstrate the ability to use resources from home, school, and community that provide valid health information.
- Analyze how media influences the selection of health information and products.

Reducing Health Risks

- Demonstrate strategies to improve or maintain personal and family health.

Setting Goals For Good Health

- Demonstrate the ability to apply a decision making process to health issues and problems individually and collaboratively.
- Apply strategies and skills needed to attain personal health goals.

NASA Relevance

Nutrition is critical for all aspects of human health, on Earth and in orbit. Without adequate nutrition, problems can arise for every single system in the body, from bone to blood and from the heart to the brain. Ensuring astronauts have the right nutrients in the food they eat in space is critical for their health on orbit and after they return to Earth. To ensure that astronauts will be able to perform their jobs during a mission, it is important that they receive adequate daily caloric and nutritional intake to maintain their energy levels and good health. Additionally, it is important to provide a large variety of foods to the International Space Station (ISS) crews that stay on orbit for long periods of time (4–6 months). Without sufficient variety, crewmembers may begin to decrease the quantity of food they consume due to mental fatigue. Inadequate food consumption, of course, leads to inadequate nutrition. Good nutrition is critical to ensure that other health measures (such as exercise) are successful. Maintaining an astronaut's health and fitness for return to Earth's gravity is crucial.

Preparing For The Activity

Student Materials (four students per group)

- 6 paper plates (for dry foods)
- 2 large cups or containers (for liquids)
- 1 permanent marker
- 2 measuring cups (one for solids, one for liquids)
- “Nutrition Facts” labels removed from food items (see Advance Preparation)
- What is a Serving Size? student handout
- Labels & Estimates student handout

Teacher Materials

- 2 packages of each of the following foods: frozen peas, dry breakfast cereal, popped popcorn (Remove and save “Nutrition Facts” labels from packaging.)
- 3 large containers for dry sample foods
- 2-liter bottle of soft drink, regular (Remove and save “Nutrition Facts” labels from packaging.)

Time for Activity

- 15 minutes for setup
- 45 minutes to conduct activity

Lesson Description

ENGAGE

Ask students, “What is a serving size?” Use students’ answers to guide them into a discussion of food portions. Explain that food portions frequently are measured in terms of “cups” or other units. Show students the measuring cups that they will be using to measure dry and liquid foods. Point out to students that each of the units commonly used in cooking can be translated to standard international (metric) units, such as liters (L) or grams (g).

After students have discussed food portions and serving sizes, challenge them to predict serving sizes for liquid and solid foods. See Figure 1.

PORTIONS VS SERVINGS*

FOOD ITEM	NORMAL PORTION	NUMBER OF SERVINGS
Bagel	1 whole	4
Muffin	1 large	3
Cinnamon bun	1 large	4
Flour tortilla	1 burrito-sized	2
Tortilla chips	1 individual bag	2
Popcorn	Movie theatre medium (16 cups)	8
Baked potato	One large	3
French fries	Medium order (4 oz)	4
Fried chicken	3 pieces (7–8 oz)	3
Steak	13 oz	5
Sliced ham or roast beef	Amount in typical deli sandwich (5 oz)	2

* Portions of many common foods consist of more than one “serving size.”

Figure 1

EXPLORE

Have Materials Managers pick up the materials for each group. Give each group a copy of the *What is a Serving Size?* student handout. Have students follow the instructions on the handout to label the plates and cups and predict appropriate portion sizes for each of the four foods.

Once students have completed their predictions, allow each group to measure and place the corresponding amounts of each food into the cup and onto the plates labeled “Estimate.”

After students have measured the amounts of food representing their predicted serving sizes, give each group a copy of the “Nutrition Facts” labels for all four foods.

Help students find the manufacturers’ suggested serving sizes for each food on the labels. Have students measure and place one serving (as indicated on the label) into the cup and on the plates marked “Food Label.” Have students observe and compare the amounts they estimated as one serving size with the amounts actually listed on the food labels.

EXPLAIN

Journal Write (Students): Write a short paragraph to answer each of the following questions:

- Compare your serving size estimates to the serving sizes recommended by the “Nutrition Facts” labels. Describe any differences.
- Based on the information you collected, why do you think it might be important to look at the serving sizes listed on food labels?
- Estimation skills are an invaluable tool to scientists, engineers, and researchers. What are some other ways you can use estimation skills on a daily basis?
- Allow each group to share its findings with the rest of the class.

Technology Insertion Point: If you and your students have access to Personal Digital Assistants (PDAs), incorporate a free software utility called FreeWrite™. FreeWrite™ is a complete word processing program. In addition to the basic word processor features, advanced features such as spell checking and revision help make writing easier for any user. Not only is the PDA a great device for keeping a journal, but students can also use the infrared capabilities of the PDA to peer-edit documents or journal entries with others. To learn more about FreeWrite™ and to download a free copy and the user's manual, visit <http://www.goknow.com/Products/FreeWrite.html>

EXTEND

Distribute a copy of the Labels & Estimates student handout to each student. Help students find other relevant information on the label, such as total calories needed and amounts of important nutrients. Point out the “Quick Hand Measures” of portion sizes on the handout. Ask students, “Do you think food labels can help you make better decisions about what and how much to eat? Explain.”

EVALUATE

Have the class develop a scoring tool to evaluate the estimation skills of their peers. One suggestion is for the class to develop the scoring tool based on the range of differences between the estimated serving size and the actual serving size of the four foods.

What is a serving size?

Student Handout

Have you ever wondered what are appropriate serving sizes of different foods? You will be investigating serving sizes of the foods displayed in your classroom.

You will need six paper plates and two cups. Label three of the paper plates and one cup as “Estimate.” Mark the other three paper plates and the remaining cup as “Food Label.”

Serving Size: Estimates

1. Write the name of each food under the Food Name column in Table 1 below.
2. For each food, decide how many cups (or fractions of cups) make up one serving size. Record your estimates in the table.
3. Take the paper plates and cup labeled “Estimate” to the station where the foods are displayed. Also bring this sheet with your serving size estimates. Measure what you recorded (estimated) for one serving size of each food on a paper plate or in the cup. Take a look at the amounts you measured. Are they more or less than you expected?

Table I. Estimates

FOOD NAME	One-serving estimate of food <hr/> Use cups as a measure

Student Handout

Serving Size: “Nutrition Facts” Labels

1. Look at the copy of the “Nutrition Facts” labels of the foods. Write the name of each of the foods under the Food Name column in Table 2 below. Find the serving size recommendations on each “Nutrition Facts” label. Write the recommended serving size listed on the “Nutrition Facts” label for each food in the appropriate space.
2. Take the paper plates and cup marked “Food Label” to the food station. Measure out the appropriate amounts of each food based on the “Nutrition Facts” labels. Put each portion on a paper plate or in the cup.

Table II. Estimates

FOOD NAME	“Nutrition Facts” food label (recommended serving size)
	Use cups as a measure

Student Handout

Journal Write: Write a short paragraph to answer each of the following questions:

1. Compare your serving size estimates to the serving sizes recommended by the “Nutrition Facts” labels. Describe any differences.
2. Based on the information you collected, why do you think it might be important to look at the serving sizes listed on food labels?
3. Estimation skills are an invaluable tool to scientists, engineers, and researchers. What are some other ways you can use estimation skills on a daily basis?

Student Handout

Labels & Estimates

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.

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*

Total Fat 0g **0%**

Saturated Fat 0g **0%**

Trans Fat 0g

Cholesterol 0mg **0%**

Sodium 490mg **20%**

Total Carbohydrate 24g **8%**

Dietary Fiber 7g **28%**

Sugars 0g

Protein 9g **16%**

Vitamin A **0%**

Vitamin C **0%**

Calcium **6%**

Iron **15%**

* 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

Student Handout

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

Quick Hand Measures

