



Estimation Challenge

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| <p>THE BASICS</p> | <p>THE TOOLBOX</p> | <p>EDUCATION STANDARDS</p> | <p>Connections Math Standard: Learning to estimate by making connections among various concepts and learning how to apply mathematics in contexts outside of math.</p> |
| <p> Grade Level: 2-12</p> | <ul style="list-style-type: none"> • 1-2 large boxes of Cheerios • 32-oz. or 48-oz. clear container with lid (i.e. Rubbermaid) | <p>SAFETY CONCERNS</p> | <p>Remind the students not to eat the Cheerios you use in this activity. You may want to provide a separate cup of Cheerios for eating.</p> |
| <p> Estimated Time: 25 min.</p> | <ul style="list-style-type: none"> • 3-oz. or 7-oz. cups, 1 per student • Paper plates, 1 for every 2-4 students • Pencil and paper | <p>FOR KIDS WITH DISABILITIES</p> | <p>Visually-impaired students can do this activity by feeling the Cheerios container. Mobility-impaired students may use a larger container and larger objects.</p> |



Educational Objective:

To learn how to use estimation to solve everyday problems.

What to Do:

- Prepare the container with Cheerios by counting them out one at a time. Write the number on a small piece of paper and tape it to the **inside** of the lid. If you are using a 32-oz. container, you should use 3-oz. cups. 7- or 9-oz. cups work best with 48- or 64-oz. containers. Try to get cups whose capacity does not divide evenly into the capacity of the container.
- During the activity, give the students paper plates, a quantity of cereal more than the capacity of the cup, and paper and pencil.
- You may save the materials for future use.

Questions to Ask Students As They Do This Activity:

- About how many Cheerios do you think the container holds?
- If you know the volume of the container and the volume of the cup, how can you figure out how many Cheerios are in the container?
- How many times will the volume of the cup fit into that of the container?

- About how many Cheerios do you think the cup will hold?

Why It Happens:

In order to figure out how many Cheerios are in the container, you need to divide the volume of the container by the volume of the cup. Then, multiply the answer by the number of Cheerios that will fit in the cup. If the cup does not divide evenly into the container, you need to "round off" and take that into account when you come up with your final answer. Remember, this is estimating. Getting the "reasonable" answer is more important than getting the exact answer. Depending on the size of the container and the age of the students, reasonable answers will vary. There will be many reasonable answers, and therefore, "winners" of the prizes.

WEB SITES

- **At Arm's Length**
http://www.pbs.org/wgbh/nova/teachers/activities/2313_threemon_02.html
(Grades 6-12)
- **How Many Pearls?**
<http://www.pbs.org/wgbh/nova/pearl/uncountable.html> (Grades 3-12)

SOFTWARE

- **Carmen Sandiego Math Detective**
The Learning Company, 1998.
(Grades 3-9)
- **Math Blaster 6-9**
Knowledge Adventure, Inc., 1996
(Grades 1-4)

READING ROOM

- Kenda, Margaret, and Phyllis Williams. **Math Wizardry for Kids.** Barron's, 1995. (Grades 3-8)
- Murphy, Stuart. **Betcha!** HarperTrophy, 1997. (Grades 1-4)
- Smoothey, Marion. **Estimating.** Marshall Cavendish, 1995. (Grades 3-8)

Career Connections

It is important for people to know the value of their property so that they can get the right amount of insurance, or ask for the right amount of money if they want to sell it. An appraiser is a person who uses what they know to estimate the value of property.

ESTIMATION CHALLENGE ACTIVITY SHEET

You Will Need:

- A cup
 - Cheerios
 - Paper plates
 - Scrap paper and a pencil
1. You teacher will show you a large container of Cheerios. Using the materials you are given, how can you estimate the number of Cheerios in the large container you were shown? Write down what you did.
 2. Discuss your answer with the other students in your group. Can you think of a way to make your estimate more accurate?
 3. We all make estimates every day. Each time you estimate you have to have some information as a reference before you can make a good estimate. What kind of information would you use in making the following estimates:
 - a. You're going through a buffet line at a birthday party. How do you decide how much of each food to put on your plate?
 - b. The bus will pick you up at 7:45 a.m. to take you to school. How do you decide what time to set your alarm so you can make it to school on time?
 - c. Your family of four is expecting three relatives to visit for a special dinner. How do you estimate how much food to buy for the special dinner? How would the ages of the children in your family and your visitors affect your estimates?
 - d. You're going on a field trip to a science museum in a nearby city. If you plan to take public transportation, buy your lunch, and buy a souvenir, how much money should you take with you? What if you are taking a car pool? Can you determine the distance and the car's approximate gas mileage to figure out how much money each person in the car should contribute for gas?

