

Activity

Measurement and the Sciences

For Good Measure

Materials

meterstick
ruler that shows millimeters
graduated cylinder
balance scale
thermometer
2 paper cups
Ping-Pong ball
golf ball

Procedure

1. Find an object whose length can be easily measured in centimeters. Make a sketch of the object in the space below. Then measure and record its length.

length: _____

2. Picture in your mind a familiar distance that you think is 3 m long. Write a description of this distance below (for example, "The distance from our classroom to room 203 down the hall"). Then measure the distance with a meterstick and record your result. How good was your guess? *(Must be something in the room)*

length: _____

3. Find an object whose width can be easily measured in millimeters. Make a sketch of the object in the space below. Then measure the object and record its length.

length: _____

4. Find a small object that fits easily on the pan of the balance scale. Make a sketch of the object, then find its mass in grams.

mass: _____

5. Fill a ^{beaker} ~~paper cup~~ about two-thirds full with a ^{water} ~~familiar drink such as milk or orange~~ juice. Pour the liquid into the graduated cylinder and record its volume in mL. Also record the type of liquid you used.

liquid: _____

volume: _____

6. The volume of a rectangular solid is measured in cubic centimeters (cm³). Find an object that is a rectangular solid. Then devise a way to find the volume of the object. What measurements will you need to make? Record each measurement and the volume of the object below. $\text{volume} = L \times W \times H$

Volume: _____

7. Fill a ^{beaker} ~~paper cup~~ about two-thirds full with ^{ice} ~~cool tap~~ water. Place the thermometer in the water and find its temperature. Record your measurement below. Spill out the water. Now fill the cup with warm tap water. Use the thermometer to find the temperature of the water. Record your measurement.

cool tap water: _____

warm tap water: _____

8. Use the balance scale to find the mass of the golf ball. Record your measurement below. Then find and record the mass of the Ping-Pong ball.

mass golf ball: _____

mass Ping-Pong ball: _____

Now take a piece of string and use it to measure the circumference of the golf ball at its widest point. You can do this by wrapping the string exactly once around the golf ball, then measuring the length of the string. Record your measurement below. Repeat this procedure for the Ping-Pong ball.

circumference golf ball: _____

circumference Ping-Pong ball: _____

Critical Thinking and Application

1. Which of the measurements that you made were most familiar to you? Which were least familiar?

2. Which of the measurements did you find easiest to make? Which did you find most difficult? Why?

3. Look at the measurements that you recorded in question 8. In what way are these two balls similar? In what way are they quite different?

4. Based on your answer to question 3, can you devise a single measurement that would describe the similarity and difference that exists between the golf ball and Ping-Pong ball?

