

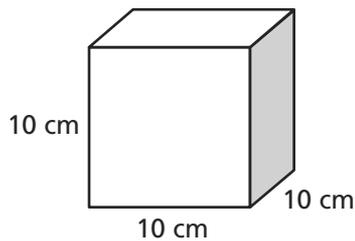
## Teaching Unit C (Continued)

### Math Background

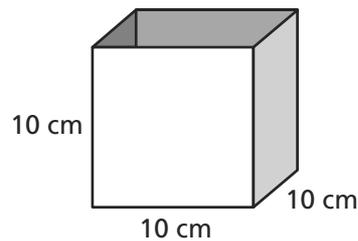
#### Volume and Capacity

Students begin this unit by examining cubes and arranging them in layers to create rectangular prisms. By doing this, students internalize a clear concept of volume that they can draw on when they are asked to develop a formula for volume.  $V = l \times w \times h$  becomes a meaningful statement for them because they see volume as one layer  $l \times w$  multiplied by  $h$  (= number of layers).

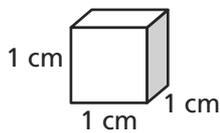
While volume is a measure of the amount of space an object takes up, capacity is a measure of how much a container can hold. Volume is measured in cubic units: cubic centimeters, cubic meters, cubic inches, and so on. Capacity is usually measured in “liquid” units, such as liters, gallons, and ounces.



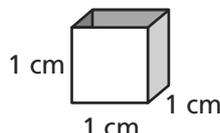
The volume of this prism is 1,000 cu cm.  
It is 1 dm  $\times$  1 dm  $\times$  1 dm.



The capacity of this container is 1 L.  
The mass of this container filled with water is 1 kg.



Volume: 1 cu cm



Capacity: 1 mL  
Mass: 1 g if filled with water

#### Weight and Mass

Because we most often talk about the weight or mass of objects on the surface of Earth, we often use the two terms interchangeably. In fact, they refer to different properties. Mass is a measure of the amount of “stuff” in an object. The mass of an object is the same on the moon as it is on Earth, because the amount of “stuff” in the object does not change. Weight is a measure of the pressure an object exerts downward because of gravity. Your weight is less on the moon than it is on Earth, because there is less gravity on the moon’s surface than there is on Earth’s surface. Weight can be measured on a scale with a spring, such as a common bathroom scale.

Both metric and customary measures are used in this unit. Working with metric units builds facility with decimals and powers of 10; working with customary units can involve a deeper understanding of multiplicative comparisons and unit fractions. Both types of measures are used in this unit.