

# Metric Mania



## Lesson 3: Volume

## English vs. Metric Units

Which is larger?

- A. 1 liter or 1 gallon
- B. 1 liter or 1 quart
- C. 1 milliliter or 1 fluid ounce



1 fl oz = 29.573 ml

1 12-oz can of soda  
would equal  
approximately 355 ml.



1 gallon = 3.79 liters



It would take approximately  $3 \frac{3}{4}$   
1-liter bottles to equal a gallon.

1 quart = 0.946 liters



**kl****L**

## Metric Units

**cl****m**

**Volume** is the amount of space an object takes up. The base unit of volume in the metric system is the **liter** and is represented by **L or l**.

Standard: 1 liter is equal to one cubic **decimeter**

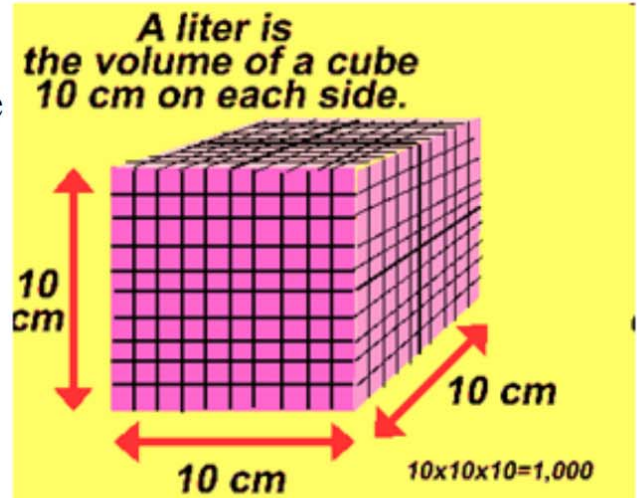
### Metric Units

1 liter (L) = 1000 milliliters (mL)

1 milliliter (mL) = 1 cm<sup>3</sup> (or cc) = 1 gram\*

### Which is larger?

- A. 1 liter or 1500 milliliters
- B. 200 milliliters or 1.2 liters
- C. 12 cm<sup>3</sup> or 1.2 milliliters\*



Click the image to watch a short video about volume.



\* When referring to water

Liter Image: <http://www.dmtturner.org/Teacher/Pictures/liter.gif>

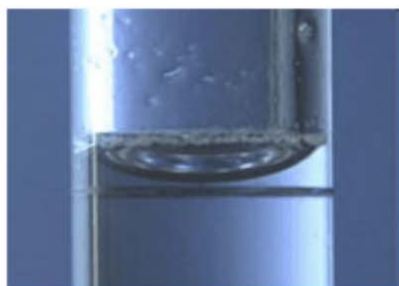
# Measuring Volume



We will be using **graduated cylinders** to find the volume of liquids and other objects.

Read the measurement based on the bottom of the **meniscus** or curve. When using a real cylinder, make sure you are eye-level with the level of the water.

What is the volume of water in the cylinder? \_\_\_\_\_ mL



What causes the meniscus?

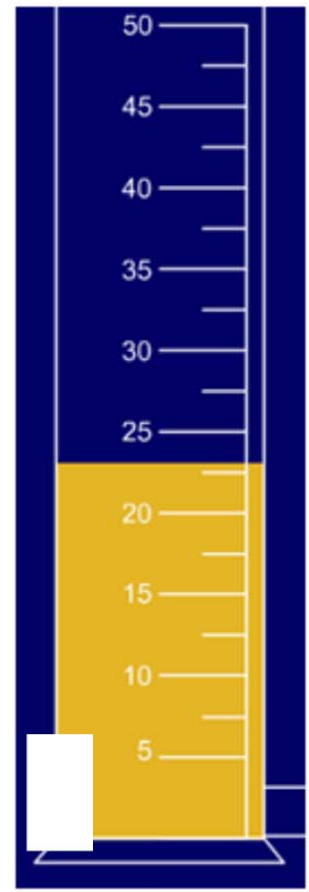
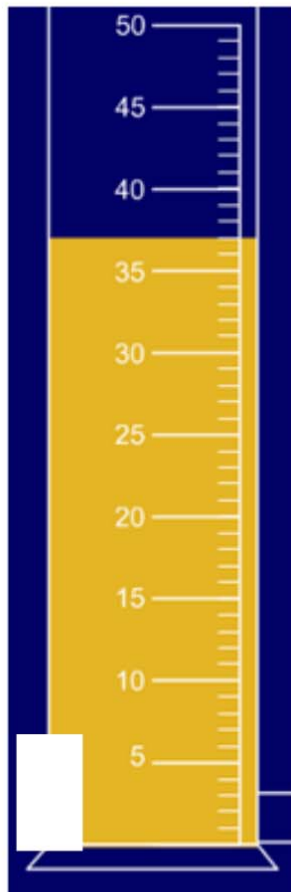
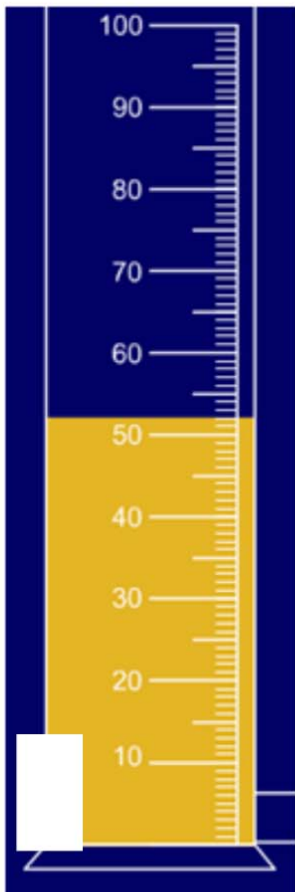
A concave meniscus occurs when the molecules of the liquid attract those of the container. The glass attracts the water on the sides.

Top Image: <http://www.tea.state.tx.us/student.assessment/resources/online/2006/grade8/science/images/20graphicaa.gif>

Bottom Image: <http://morrisonlabs.com/meniscus.htm>

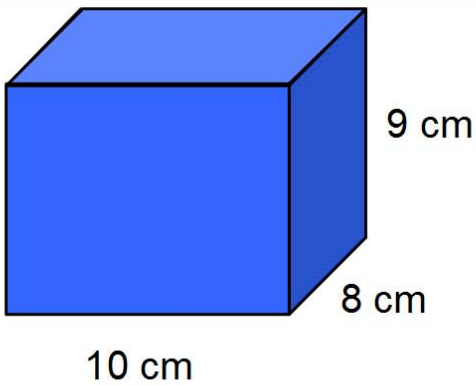
# Measuring Liquid Volume

What is the volume of water in each cylinder?



Pay attention to the scales for each cylinder.

## Measuring Solid Volume



We can measure the volume of regular object using the formula **length x width x height**.

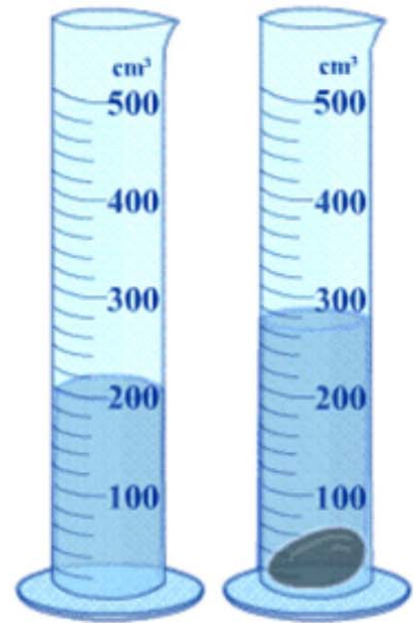
$$\underline{\quad} \times \underline{\quad} \times \underline{\quad} = \underline{\quad}$$

We can measure the volume of irregular object using **water displacement**.

Amount of H<sub>2</sub>O with object = \_\_\_\_\_

About of H<sub>2</sub>O without object = \_\_\_\_\_

Difference = Volume = \_\_\_\_\_



Click here for an online activity about volume.  
Choose Lessons  Volume & Displacement