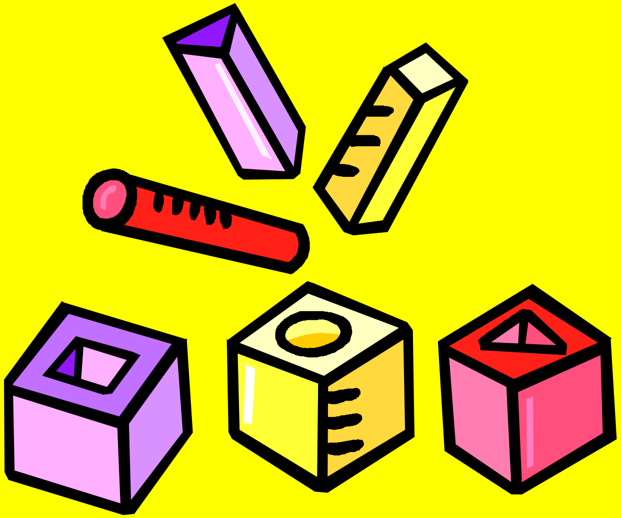
Metric Mania



Lesson 3: Volume

T. Trimpe 2008 http://sciencespot.net/

English vs. Metric Units

Which is larger?

A. 1 liter or 1 gallon

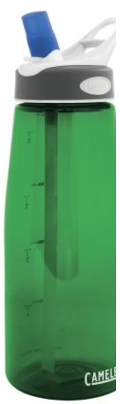
B. 1 liter or 1 quart

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 quart = 0.946 liters



1 gallon = 3.79 liters

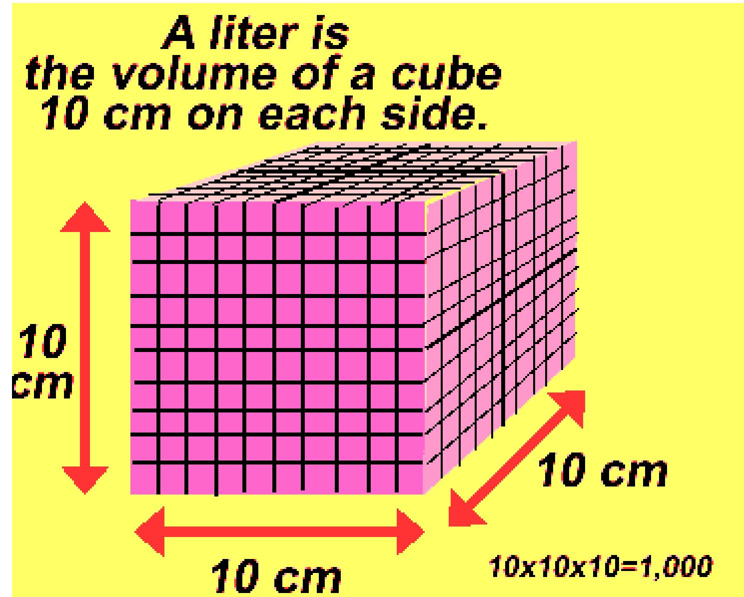
It would take approximately 3 ¾ 1-liter bottles to equal a gallon.

kL L Metric Units cL mL

Volume is the amount of space an object takes up.

The base unit of volume in the metric system in 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^3 (or cc) = 1 gram*

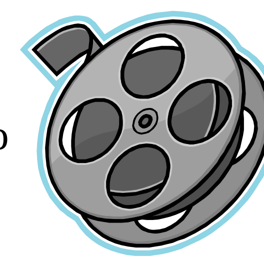
Which is larger?

A. 1 liter or $\boxed{\text{1500 milliliters}}$

B. 200 milliliters or $\boxed{\text{1.2 liters}}$

C. $\boxed{12\ cm^3}$ or 1.2 milliliters*

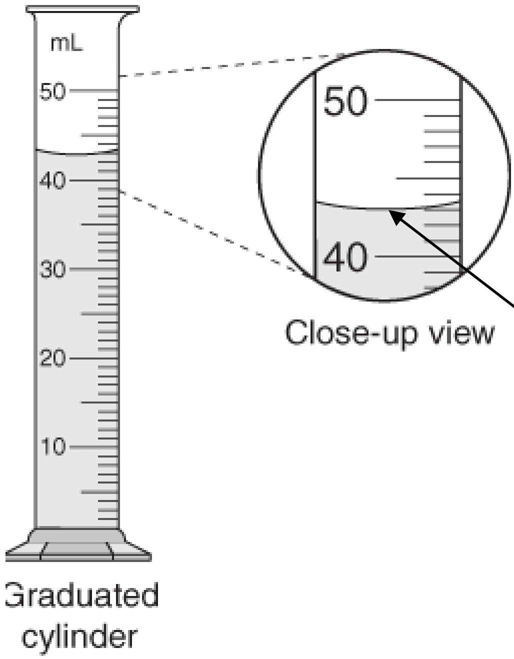
Click the image to watch a short video about volume.



* When referring to water

Liter Image: http://www.dmturner.org/Teacher/Pictures/liter.gif

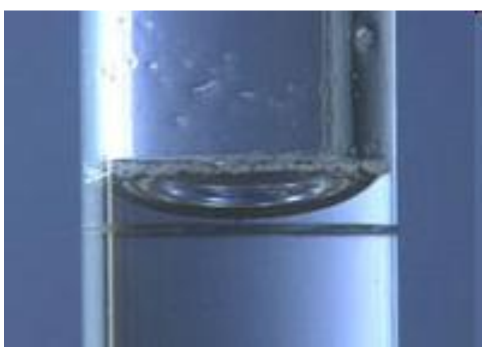
Measuring Volume



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



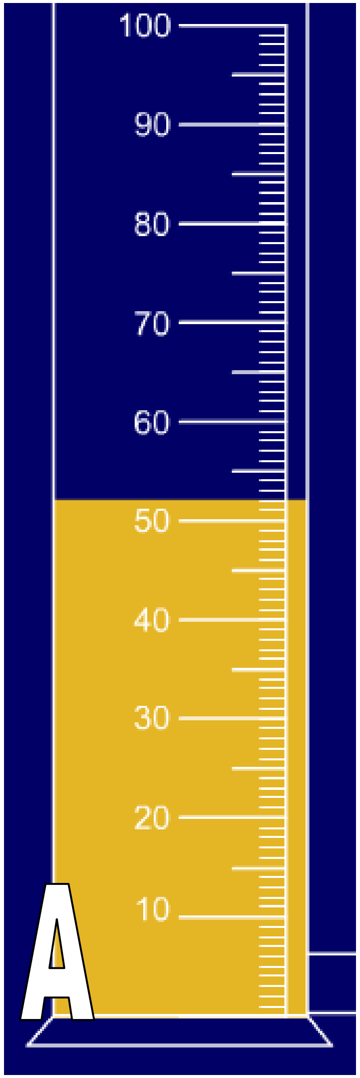
What causes the meniscus?

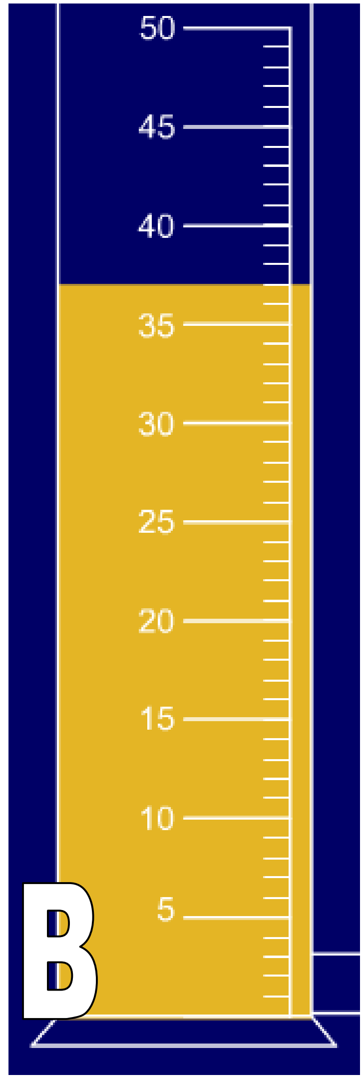
A concave meniscus occurs when the molecules of the liquid attract those of the container. The glass attracts the water on the sides.

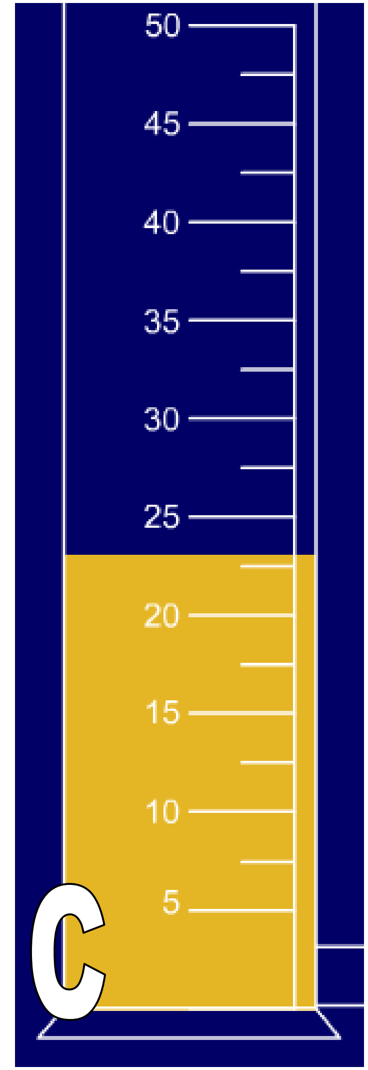
Top Image: http://www.tea.state.tx.us/student.assessment/resources/online/2006/grade8/science/images/20graphicaa.gif
Bottom Image: http://morrisonlabs.com/meniscus.htm

Measuring Liquid Volume

What is the volume of water in each cylinder?



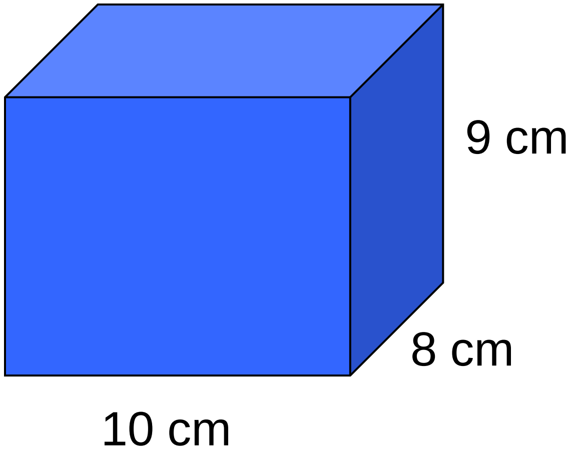




Images created at http://www.standards.dfes.gov.uk/primaryframework/downloads/SWF/measuring_cylinder.swf

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**.

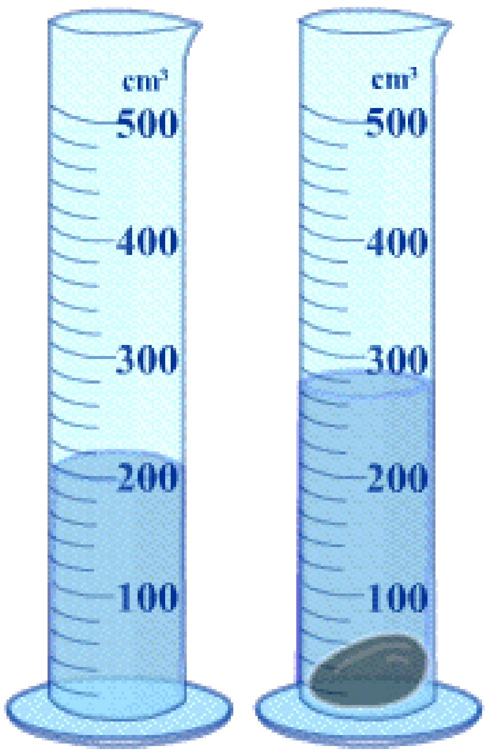
_____ X _____ X _____ = _____

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

Amount of H_2O with object = ______

About of H_2O without object = ______

Difference = Volume = ______



http://resources.edb.gov.hk/~s1sci/R_S1Science/sp/en/syllabus/unit14/new/testingmain1.htm

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