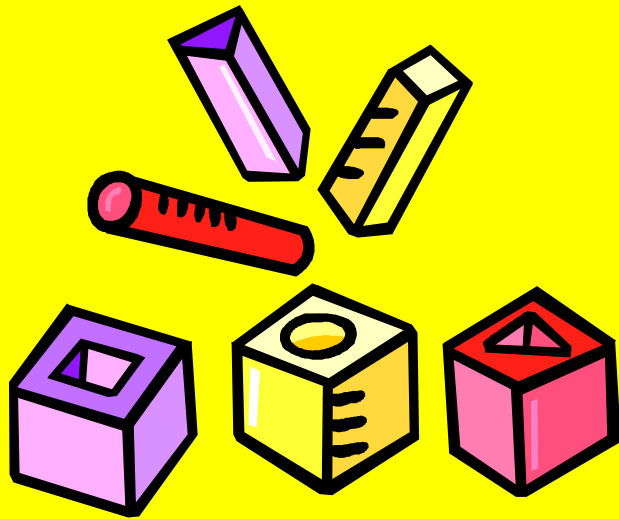# Metric Mania

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 quart = 0.946 liters

1 gallon = 3.79 liters

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

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** cm

Metric Units

1 liter (L) = 1000 milliliters (mL)
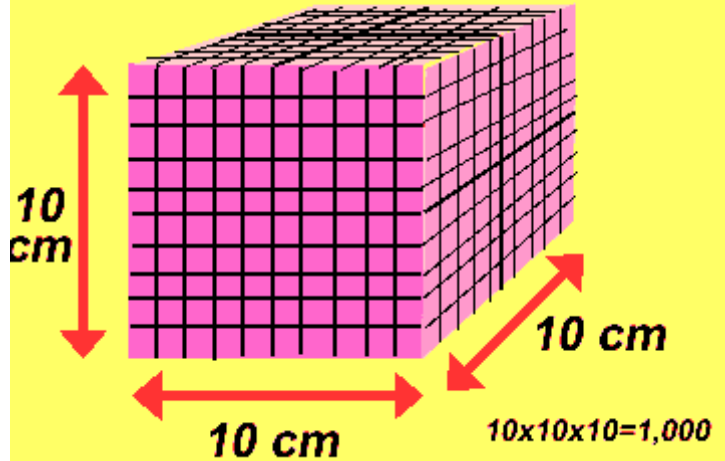
1 milliliter (mL) = 1 cm^3 (or cc) = 1 gram*

Which is larger?

A. 1 liter or 1500 milliliters

B. 200 milliliters or 1.2 liters

C. 12 cm^3 or 1.2 milliliters*
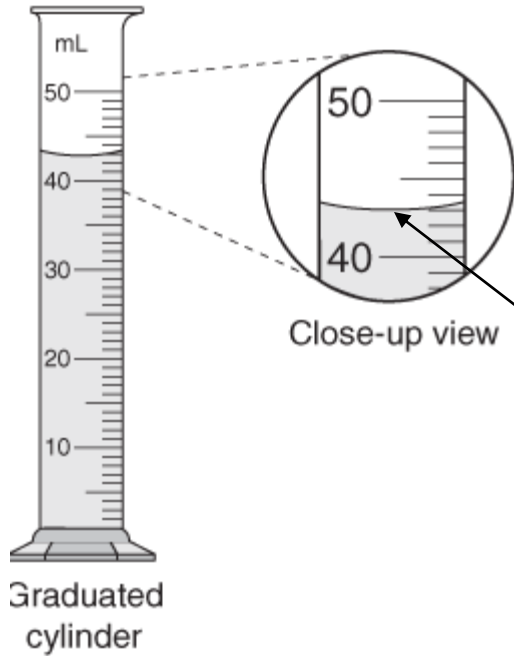
A liter is the volume of a cube 10 cm on each side.

10 cm

10 cm

10 cm

10x10x10=1,000

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

mL
50
40
30
20
10

Graduated
cylinder

Close-up view
50
40
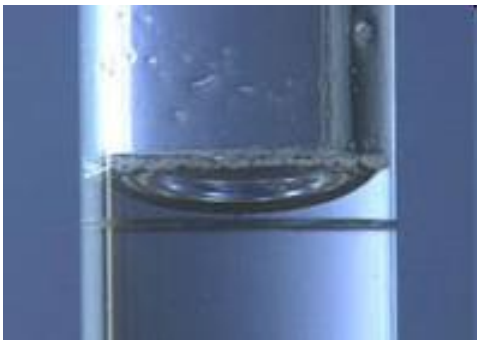
We will be using **graduated cylinders** to find the volume of liquids and other objects.

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.

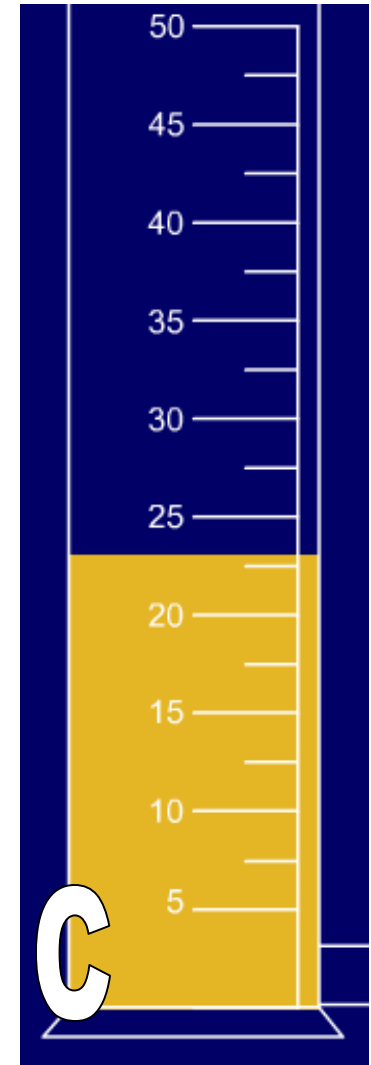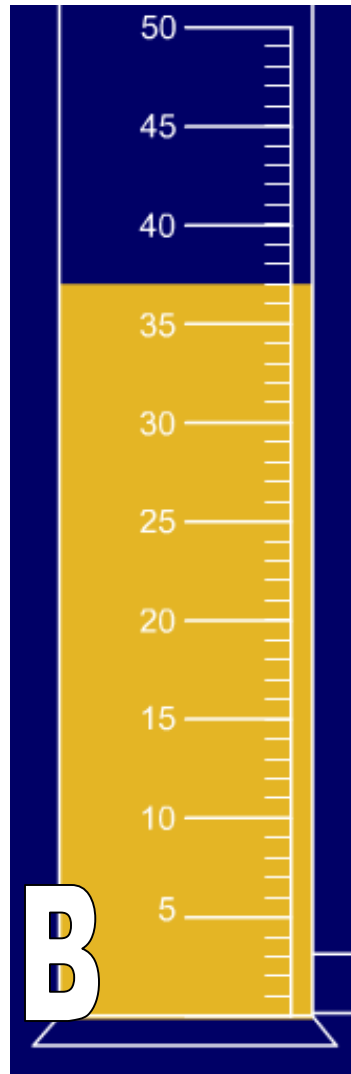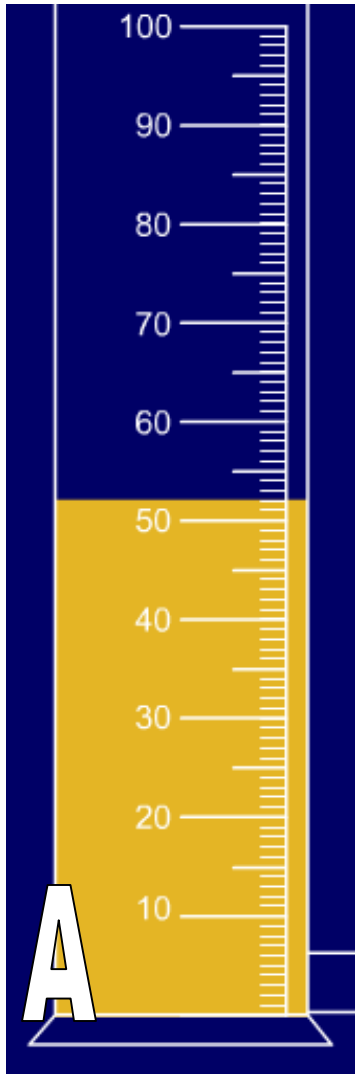What is the volume of water in the cylinder? _____mL

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.
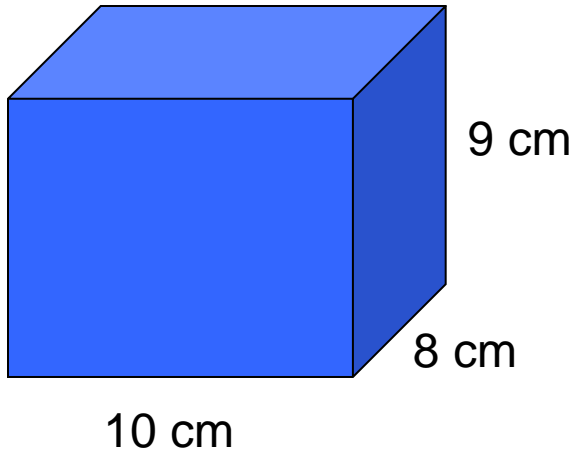
Measuring Liquid Volume

What is the volume of water in each cylinder?

A — 100, 90, 80, 70, 60, 50, 40, 30, 20, 10

B — 50, 45, 40, 35, 30, 25, 20, 15, 10, 5

C — 50, 45, 40, 35, 30, 25, 20, 15, 10, 5

Pay attention to the scales for each cylinder.

Measuring Solid Volume

9 cm

8 cm

10 cm

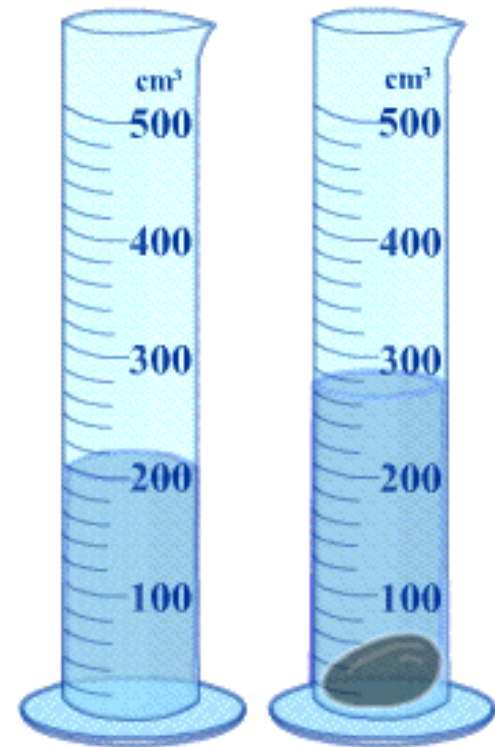We can measure the volume of regular object using the formula **length x width x height**.

_____ 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 = _____

cm³
500
400
300
200
100

cm³
500
400
300
200
100