

METRIC COMPARISON

Using the International System of Units



LENGTH AND DISTANCE

LENGTH AND DISTANCE

Length is the distance from one point to another. The basic SI unit of length and the base metric unit for length is the **meter** which is represented by a lowercase **m**.

Metric Units

1000 meters (m) = 1 Kilometer (km)

1 meter (m) = 100 centimeters (cm)

1 meter (m) = 1000 millimeters (mm)

Click the image to watch a short video about the meter.



Which is larger?

A. 1 meter or 105 centimeters

B. 4 kilometers or 4400 meters

C. 12 centimeters or 102 millimeters

D. 1200 millimeters or 1 meter

Length & Distance

- Millimeter –**
About the thickness of a dime
- Centimeter –**
About the width of little finger
- Meter –**
About the height of a Kindergartener
- Kilometer –**
*Little over a 1/2 mile -
About distance from LJHS to McDonalds on Maple.*

Metric Measure of Length

The **meter** is the basic unit of length.

A dime is about 1 millimeter thick.

Your little finger is about 1 centimeter wide.

Your pointer finger is about 1 decimeter long.

Many kindergarten children are about one meter tall.

It takes about 10 minutes to walk 1 kilometer.
It takes about 3½ minutes to ride a bike 1 kilometer.

millimeter (mm) = $\frac{1}{1000}$ m
centimeter (cm) = $\frac{1}{100}$ m
decimeter (dm) = $\frac{1}{10}$ m
METER (m)
dekameter (dam) = 10 m
hectometer (hm) = 100 m
kilometer (km) = 1000 m

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METRICS

LENGTH AND DISTANCE



Which is longer?

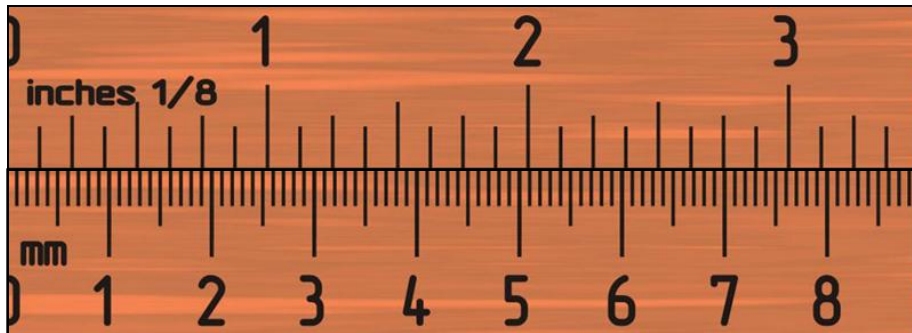
- A. 1 mile or 1 kilometer
- B. 1 yard or 1 meter
- C. 1 inch or 1 centimeter
- D. 1 inch or 22 millimeter

1 mile

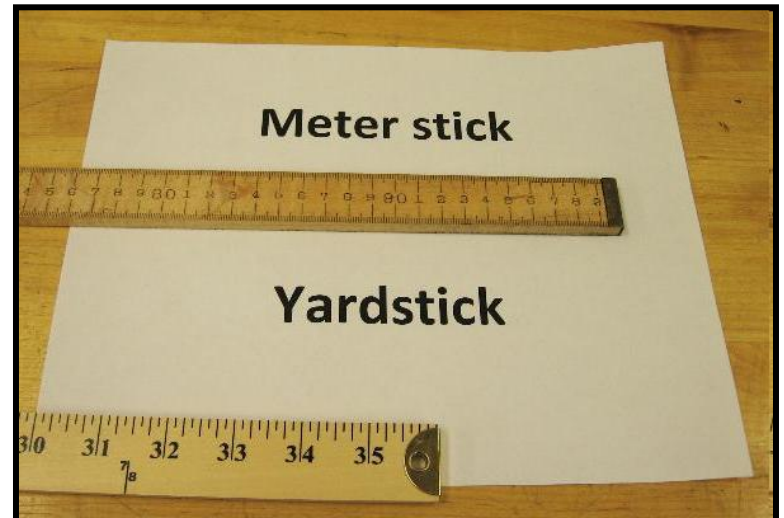
1 kilometer

0.6 kilometer

1.6 kilometers



1 inch = 2.54 centimeters



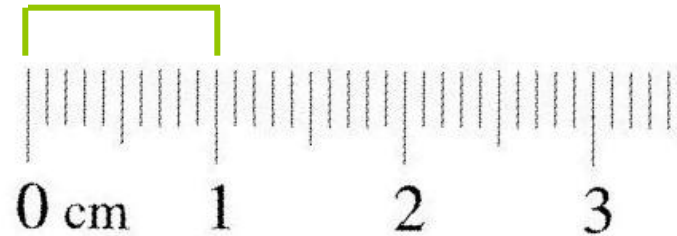
1 yard = 0.9444 meters

LENGTH AND DISTANCE

MEASURING LENGTH AND DISTANCE

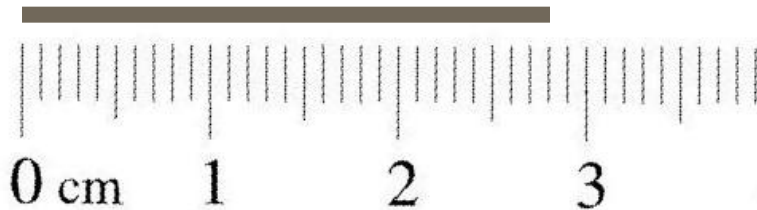
How many millimeters are in 1 centimeter?

1 centimeter = 10 millimeters



What is the length of the line in centimeters? 2.8 cm

What is the length of the line in millimeters? 28 mm





VOLUME

VOLUME

Volume is the amount of space an object takes up. The basic SI unit of volume and the base metric unit for volume is the **liter** which is represented by a capital **L**.

Metric Units

1000 liters (L) = 1 kiloliter (kL)

1 liter (L) = 1000 milliliters (mL)

Which is larger?

A. 1 liter or 1500 milliliters

B. 200 milliliters or 1.2 liters

C. 12 kiloliters or 1200 liters

Click the image to
watch a short video
about volume.



Volume

Milliliter –

About 2 drops
of water

Liter –

A bit smaller than
a quart.
Size of a large
reusable water
bottle.

Kiloliter –

About 5 bathtubs
 $\frac{1}{2}$ filled.

Metric Measure of Volume (Capacity)

The **liter** is the basic unit of volume or capacity.

milliliter (mL) = $\frac{1}{1000}$ L

centiliter (cL) = $\frac{1}{100}$ L

deciliter (dL) = $\frac{1}{10}$ L

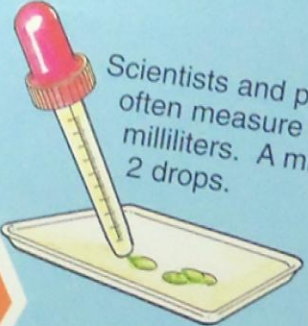
LITER (L)

dekaliter (daL) = 10 L

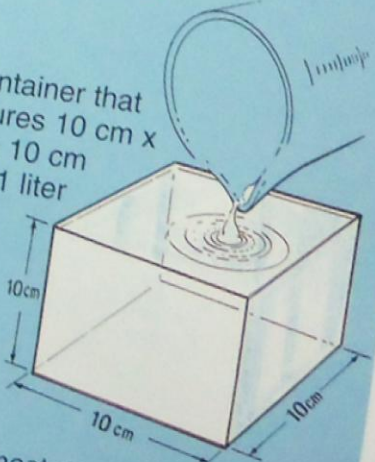
hectoliter (hL) = 100 L

kiloliter (kL) = 1000 L


Scientists and pharmacists often measure liquids in milliliters. A milliliter is about 2 drops.



A container that measures 10 cm x 10 cm x 10 cm will hold 1 liter of water.



In most countries, liquids are measured in liters. In the United States, however, labels on many liquids show both ounces and liters.



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Volume

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

3.79 liters

=

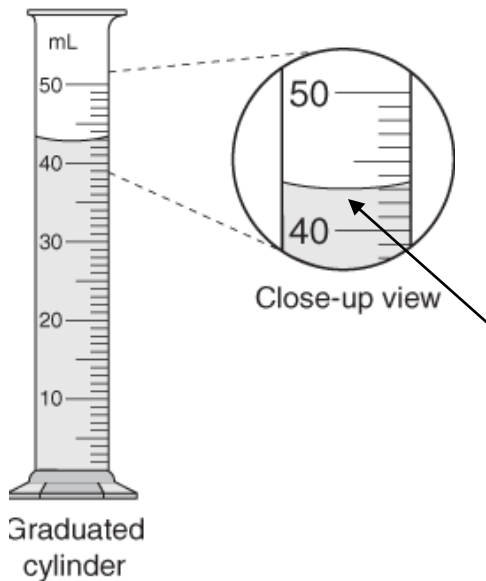
1 gallon



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

VOLUME

MEASURING VOLUME



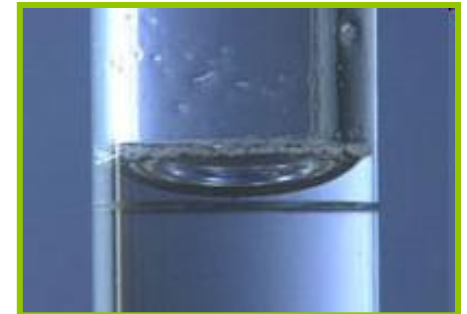
We will be using **graduated cylinders** to find the volume of liquids.

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? 43 mL

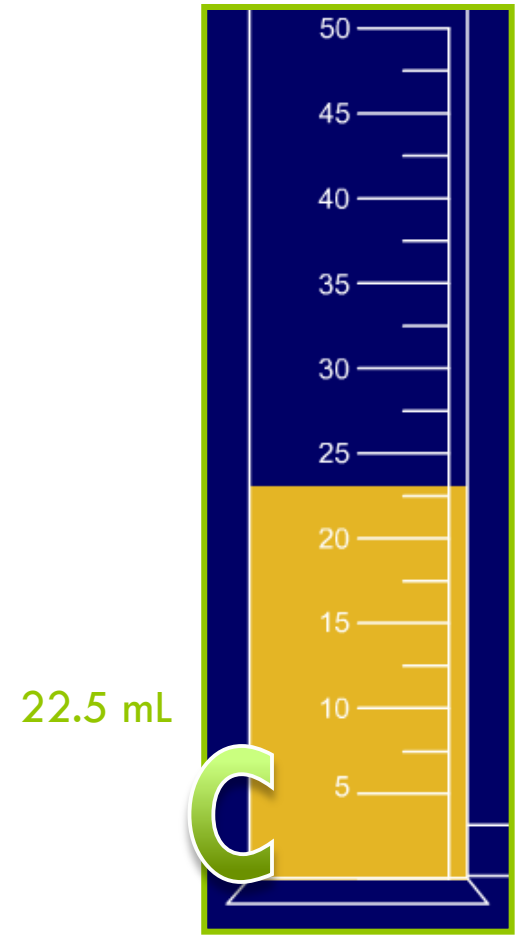
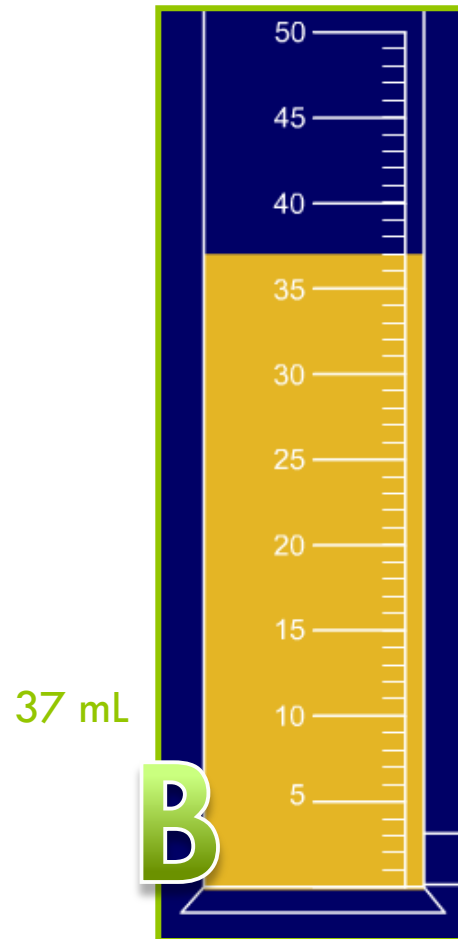
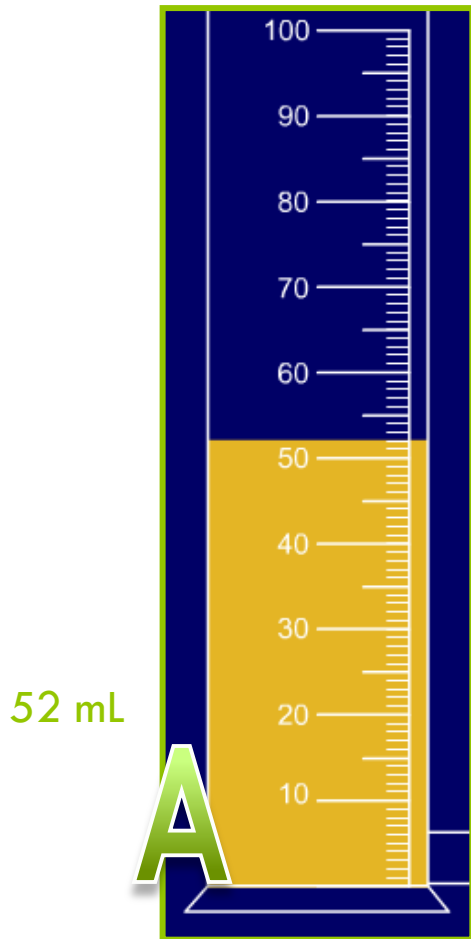
What causes the meniscus?

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



VOLUME

What is the volume of water in each cylinder? (Pay attention to the scales!)





MASS

MASS

Mass refers to the amount of matter in an object. The basic SI unit of mass is the kilogram which is represented by a lowercase **kg**. The base metric unit for mass is the **gram** which is represented by a lowercase **g**.

Metric Units

1000 grams (g) = 1 kilogram (kg)

1 gram (g) = 1000 milligrams (mg)

Click the image to
watch a short video
about volume.



Which is larger?

A. 1 kilogram or 1500 grams

B. 1200 milligrams or 1 gram

C. 12 milligrams or 12 kilograms

D. 4 kilograms or 4500 grams

Mass

Milligram –

Used to measure the chemicals in medicine.

Gram –

About the mass of a paperclip.

Kilogram –

About the mass of a grapefruit. A little less than a pound.

Metric Measure of Mass

The **gram** is used to measure mass.

Doctors and pharmacists use milligrams to measure chemicals or minerals in medicines.

GRAM (g)

milligram (mg) = $\frac{1}{1000}$ g

centigram (cg) = $\frac{1}{100}$ g

decigram (dg) = $\frac{1}{10}$ g

dekagram (dag) = 10 g

hectogram (hg) = 100 g

kilogram (kg) = 1000 g

Calcium Supplement 250mg

Vitamins 500mg

The water in this container has a mass of 1 gram.

The mass of a standard paper clip is about 1 gram.

A grapefruit's mass is about 1 kilogram.

The mass of some types of cars is about 1000 kilograms.

MASS

Which is larger?

1. 1 Pound or 100 Grams
2. 1 Kilogram or 1 Pound
3. 1 Ounce or 1000 Milligrams



1 pound = 453.6 grams



1 ounce of gold =
28,349.5 milligrams



1 kilogram = 2.2 pounds

100 kilograms =
220 pounds

MASS

MEASURING MASS

We will be using **electronic balances** to find the mass of solid objects.

Read the measurement on the digital screen.

What is the mass of DVD? 99.5 g

