Metric System

International System of Measurement, Metric Conversions, Length, Mass, Volume, Tools of Science

The Basics

- Scientists all over the world use the International System of Measurement.
- Since scientists everywhere use the same measurements, it helps eliminate confusion when scientists from different places share their data.

Metric Unit Conversion

- The metric system is based on multiples of 10. Prefixes are used to indicate the unit.

- king henry Died by drinking chocolate milk is a mnemonic to help remember the order of metric system.

Metric Unit Conversions

- To convert to a smaller unit, move the decimal point to the right**.** To convert to a larger unit, move the decimal to the left.

- Do the Practice Problems

Using a Metric Ruler

- Always use the centimeter side of the ruler.
- There are 30 centimeters on a standard metric ruler.
- Each centimeter is divided into 10 smaller parts called millimeters.

Using a Triple Beam Balance

- Always start with the value at zero.
- To find the correct mass, move the weights until the pointer is flat.

Using a Triple Beam Balance

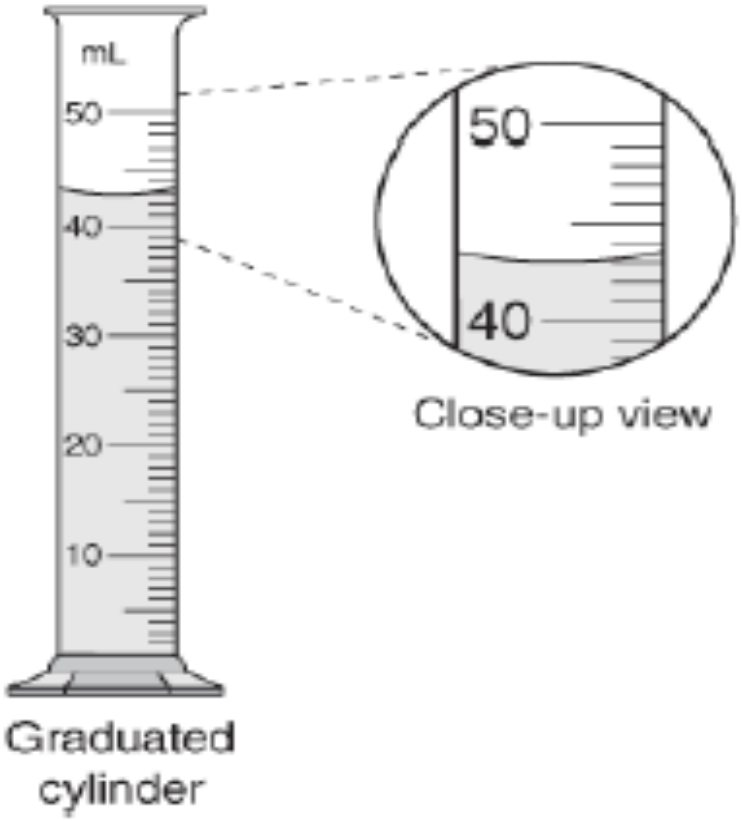
- To calculate the mass, add all three beams together. Be sure to line up the decimals!

- Triple Beam Balances typically measure using the unit of grams.

Using a Graduated Cylinder

- Graduated cylinders typically measure using the unit of milliliters.
- Liquid molecules “stick” to the side of a graduated cylinder causing the liquid to make a “dip” called the meniscus.
- To correctly read the volume, look at the bottom part of the meniscus.

Reading the Meniscus



Volume is <u>43 ml</u>

SCIENCE TOOLS

- **To become a successful scientists, we must be able to identify and use scientific instruments or tools.**
- **These tools are for collecting data, taking measurements, and recording observations.**
- **Scientists use a variety of tools to do investigations.**

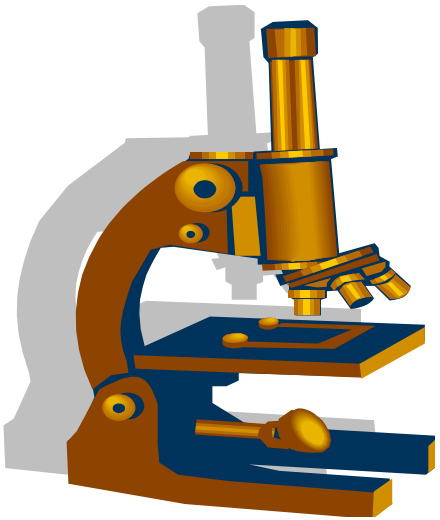
Computer

- An electronic tool that is used to help scientists
  - Complete research
  - Analyze results of an experiment
  - Graph data
  - Communicate results to other scientists

Calculators

- **An electronic device for solving mathematics problems**

Microscope



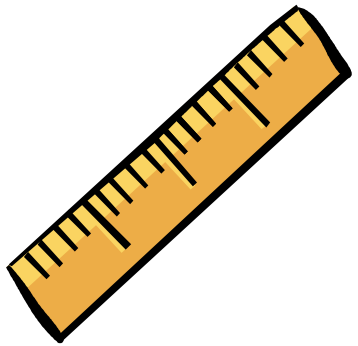
- ‘micro’ means small while ‘scope’ means to see
- Magnifies smaller objects
- Utilizes slides that are used by scientists to view thin sections of objects or cells

Telescope

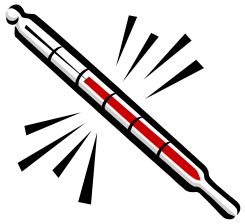
- A tool used to see objects in the sky.
- It magnifies or makes objects in the sky larger.

Meter Stick

- **A meter tool that is used to measure distance and the length of objects.**
- **Can measure an object using decimeters, centimeters, or millimeters**



Thermometer



- A tool used to measure temperature.
- It measures the temperature of air and most liquids.
- The Greek prefix "therm" means "heat".

Stopwatch

- A tool used to measure time.
- Measures time in seconds (s).

Balance

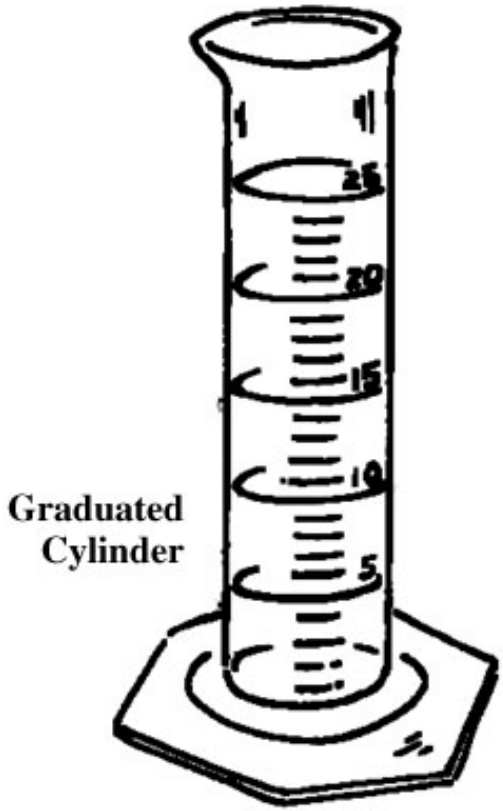
- A tool used to measure the mass of an object.
- A balance tells the amount of matter an object contains.

Test Tube

- Is open at one end and closed at the other.
- It is cylindrical in shape.
- Hold fluids needed in a lab experiment

Graduated Cylinder

- Is used to measure the volume of a liquid.
- The volume is read by reading the bottom of the meniscus.



Graduated Cylinder

Spring Scale

- Can be used to measure the mass of an object
  - Has a spring at one end and a hook on the other.
  - The object is hung from the hook.