

Weight, Mass , and Volume Measurement Information

Matter: Anything that has mass and volume.

Weight: The amount that **gravity** pulls on objects. Measured with a scale of some type, that either stretches or compresses a spring. Metric unit is the Newton.

Mass: The amount of matter something has. Measured with a balance, which functions as a lever. An objects mass on one side of the lever must equal the mass or torque on the other side of the balance. Metric unit is the gram or kilogram.

Volume: The amount of space something takes up or occupies. Measured in a variety of ways depending on materials state of matter and/or shape. Metric units are the liter, ml, and cm^3 .

Solids:

For regularly shaped solids like cubes, rectangular prisms, cylinders and spheres you use a formula. Units are in cm^3 ($1 \text{ cm}^3 = 1 \text{ ml}$)

Always estimate measurements carefully!

Cube: $V = s^3$

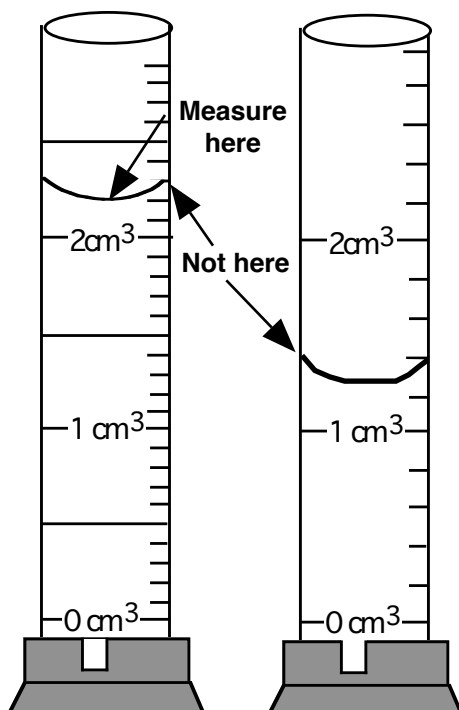
Rectangular Prism: $V = L \times W \times H$

Cylinder: $V = \pi r^2 h$

Sphere: $V = \frac{4}{3} \pi r^3$

For irregularly shaped solids, like a rock, use liquid displacement in a liquid that doesn't dissolve the solid or allow it to float. Place object into a measured amount of liquid, and the amount that the liquid goes up by, is equal to the volume of the object.

Liquids:



Use a graduated cylinder. Determine how much each of the smallest divisions equals and estimate the volume carefully! Do this for the two graduated cylinders to the left.

- 1- Place cylinder on a flat and level surface.
- 2-Get eye level with the surface of the liquid .
- 3-Measure the liquid from the center/bottom of the meniscus.