Density Notes

Mathematical Definition: $D = \frac{m}{V}$
- Amount of mass in a given volume

Particle Definition:
- A measure of how tightly packed matter is

Example Calculation:

If you were given a rock with a mass of 243.5g and a volume of 94.3 cm^3, what would be the rock's density?

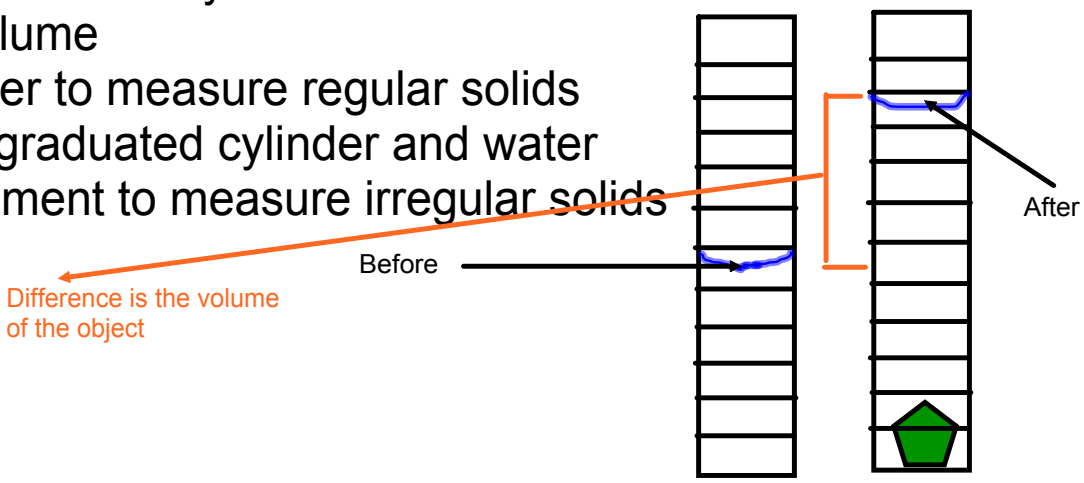
$$D = \frac{m}{V} = \frac{243.5g}{94.3\ cm^3} = 2.6\ \frac{g}{cm^3}$$

Dont forget the units
They need to be a
mass over a volume

Quick Measurement Reminder:

Mass- Amount of matter in an object
- measured in the base unit of grams (g)
- use a tbb (tripple beam balance) to measure

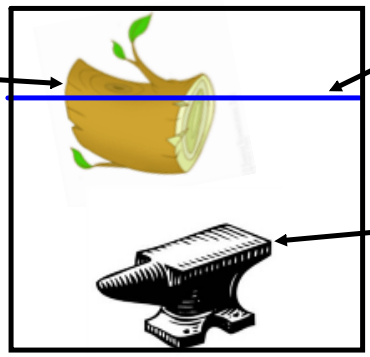
Volume- Amount of space an object occupies
- Measured in base units of liters (liquids- ml) and length cubed (solids- cm^3)
- Use graduated cylinder to measure liquid volume
- use ruler to measure regular solids
- Use a graduated cylinder and water displacement to measure irregular solids



Density Notes continued

Why Objects Float/ Sink:

- **NOT** because they are "Light", or "Heavy"
- because they are more dense (sink), or less dense (float) then the liquid they are in.



Wood
Density: ~0.7 g/cm^3

Pure Water
Density: 1.0 g/ml

Iron
Density: ~7.9 g/cm^3

Note:
- Object that is MORE dense than the liquid SINKS
- Object that is LESS dense than the liquid FLOATS

- Sinking and floating does not have to do with only wood and iron
- Liquids sink and float also

Olive Oil
Density: 0.9 g/ml

All the delicious things that make up Italian dressing
Density: More than 0.9 g/ml

Density Notes continued

Buoyancy

- floating objects are often called buoyant
- simply relating the density of one object to another

Very Simple- The more there is a difference between the density of an object and the density of the liquid it is floating in, the more buoyant that object.

Confused yet? See the example below