Section 4\_2 Notes (adapted): Measuring Matter

Mass: The amount of stuff (matter) in an object. (note, weight depends on gravity, mass is independent of gravity)

Volume: The amount of space an object takes up (gas is more complicated … its volume depends on pressure, and maybe the volume of the container that it is in)

All matter has these two characteristics.

Measuring Mass

Use Kilograms (1000 grams) aka kg. 1 kg = 1000 g

“kilo” means “one thousand”

“milli” means “one one thousandth” notice the ‘th’ at the end? That means it is a smaller bit. “milligram” = 1/1000 of a gram. (0.001 g)

Measuring Volume

Use Litres (1L = 1000 cc or ‘cubic centimeters’ ) \*\*1 cc = the size of 1 die\*\*

Think of a 1 L milk container, that hold 1000 cc!! How many cc in 1 cubic meter??

1cc = 1 mL (1 cubic centimeter = 1 cubic millilitre

Volume = l \* w \* h

RULE:

When you plop a solid object into the water, if it floats, the amount of water (liquid) that is moved out of the way (displaced) will equal the mass of the object!

RULE:

When you plop an object into water, if it sinks, the amount of water it displaces will equal its VOLUME!

How do you take the mass of a chunk of stuff, that has a specific volume, and use this information to help identify it as a specific type of matter? You find its DENSITY:

D = m / v

Examples;

Pure water, mass of 1 kg, volume will be 1 L

D = m/v

= 1 / 1

D = 1

Pure water has a density of 1.

Any object with a density greater than 1 will sink in water. Any object with a density less than water (lower than 1) will float in water.

Does ice have a density greater than or less than 1? What about a chunk of limestone? Wood?

Density of gas works the same; the less dense gas will rise higher in another gas….