SCIENCE

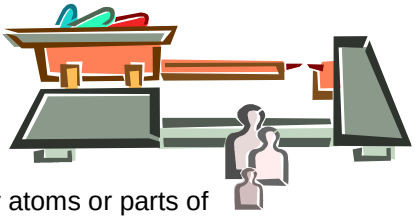
NAME: PERIOD: DATE:

Matter, Mass, Weight, and Density Notes

Matter – is the atoms or parts of atoms that make up all solids, liquids, gases, and plasmas.

Ex. a brick (a solid,) water (a liquid,) air (a gas,) or the surface or the sun (plasma)

Mass – is a measurement of the amount of matter that makes up an object.



Metric mass units: any kind of gram

English mass units: pounds, tons, ounces

An objects mass does not change with gravity. Mass is based on how many atoms or parts of atoms an object is made out of, and that doesn't change with gravity.

Weight – is the measurement of gravity's pull on an object.

On the Earth, an object's mass and weight are the same since we take Earth's gravity for granted.

Since an object's mass and weight are the same on Earth, we use the same units for both.

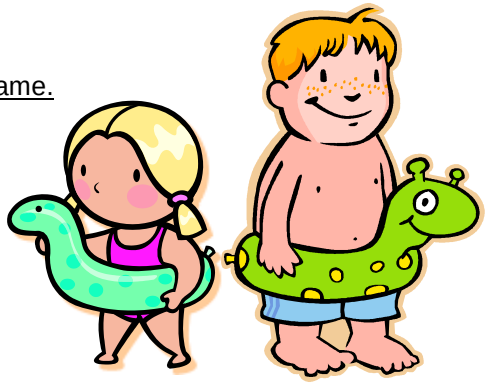
An object's weight can change if the force of gravity on it changes. For example, if you go to the Moon, your weight would be less since the gravity of the Moon is less than Earth's.

Density – is a ratio (a comparison) of an object's mass and volume

Mathematically: $\textbf{Density} = \frac{\textbf{Mass}}{\textbf{Volume}}$ (That's Mass divided by Volume)

Units for density are: grams/milliliter (g/mL) or grams/cm^3 (g/cm^3)

No matter what size sample of a material you have, the density is the same.



The density of water is 1 g/ml.

Objects with a density of greater than 1 g/ml will sink in water.

Objects with a density of less than 1 g/ml will float in water.

In general:

- if an object or substance is in a liquid or gas that is less dense than itself then it will sink in that liquid or gas.

- if an object or substance is in a liquid or gas that is more dense than itself then it will float in that liquid or gas