

Matter

Physical Science 1.2

Objectives

- Students will
 - Explain what matter is
 - Describe how to measure the mass of matter
 - Describe how to measure the volume of matter
 - Identify the smallest particles of matter
 - Describe how atoms combine into molecules
 - Describe how atoms and molecules move

The Universe is made up of Matter

Matter: anything that has mass and takes up space (volume).

- Matter makes up all the objects and living things.
- Light and sound are not matter

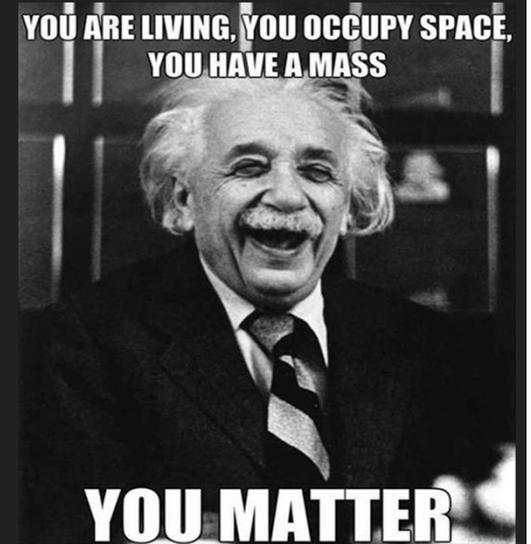
Mass vs Weight: Mass (remember) is the amount of matter in an object

- Weight: the downward pull of an object due to gravity.

- measured using a scale; spring

scale

- scientific unit = newton (N)



Matter is made up of Atoms

Atom: is the smallest basic unit of matter.

(teaspoon of water contains 500,000,000,000,000,000, 000 atoms)

- 2 or more atoms bond to form molecules. (can be same or different atoms)
- Ex. H₂O, H₂

Molecule: smallest amount of a substance made of combined atoms that is considered to be that substance. (break water down = individual atoms -different than molecule H₂O)

Molecules cont.

Molecules are made of different numbers of the same atom are different substances.

- Ex. O₂, O₃
- Properties unique to molecule

Atoms & Molecules are always in motion!

- Food coloring spreading through water, boiling water.
- Atoms in solids move less freely but still moving.

Matter is made up of atoms (smallest unit of matter)

Elements: made up of the same atoms; cannot be broken down into other substances by chemical means Ex. Iron (Fe), Aluminum (Al), Oxygen (O), Hydrogen (H)

Compounds: substance composed of given combination of elements that can be broken down into elements by chemical means. Ex Water (H₂O), Carbon Dioxide (CO₂)

Mixtures: something with variable composition

Homogeneous (pure substance)
uniform composition ex. Saline
Solution, brass (Cu & Zn)

Solution

Heterogeneous: mixture
containing regions of varying
compositions. Ex sand & water,
trail mix

Suspension

Solution vs.
Heterogeneous Mixture



Salt water
solution
homogeneous
stable



Chocolate milk
h. mixture
heterogeneous
will settle

Solutions are made up of two parts :

-Solvent: the substance in larger amount;
what
does the dissolving.

- Solute: the substance being dissolved.

-*Soluble*: Able to dissolve and form a solution.
Only 1 phase in solutions
Ex. Salt Water (water=solvent; salt=solute)

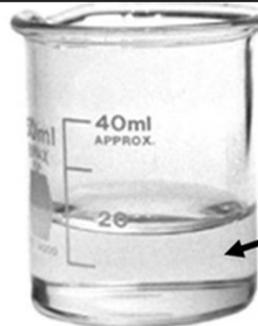
“Like dissolves Like”

Polar solvents dissolve
polar solutes- not
nonpolar.

Nonpolar dissolves
nonpolar.



Solute



+ solvent

water

→

solution

solution

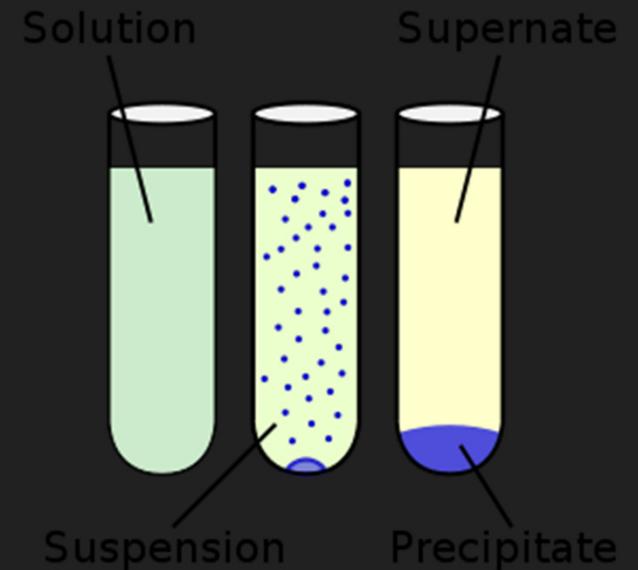
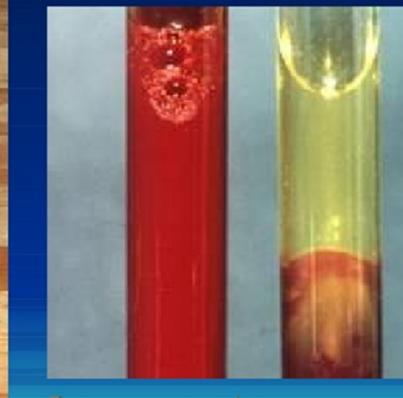


Suspensions

A **suspension** is a heterogeneous mixture in which solute-like particles settle out of a solvent-like phase some time after their introduction; insoluble particles suspended by liquid or gas

- 2 phases

- “Liquids that need to be shaken first before use”



Vocab Quiz Tomorrow

Matter, atom, element, compound, mixture, solution, suspension, 3 states of matter, heterogeneous, homogeneous.