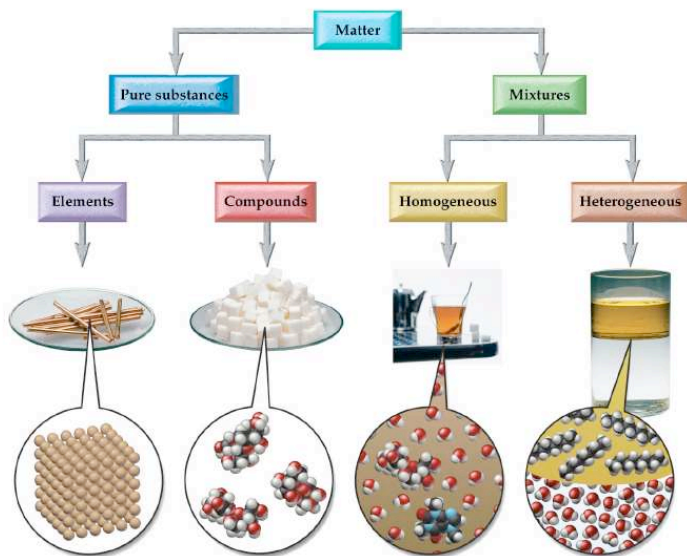


Matter has both mass and volume



Pure substances:

Mixtures:

Elements, compounds, and mixtures

Elements have only one type of:

Compounds: pure substances with more than one different element

Chemical formulas: show ratio of elements in a pure substance

NaCl:

H₂O:

Fe:

Br₂:

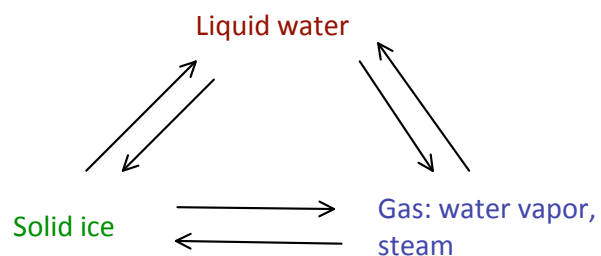
Homogeneous mixtures:

Heterogeneous mixtures:

Physical and chemical changes

Physical changes: change the form or appearance of substance, but still have...

Phase changes are physical changes (between solid, liquid, and gas)



Dissolving, mixing, grinding are physical changes

Filtration, distillation, and other methods of separating mixtures into their pure substances are also physical changes.

Chemical changes

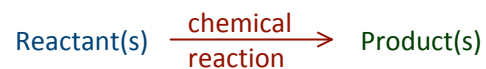
Chemical change:

- A new type of matter is formed
- A new chemical formula is written
- Also known as a chemical reaction

Clues that a chemical change has occurred (all of these are evidence that a new substance has formed)

- Color change
- Odor, gas evolved (but not just from boiling)
- Flame, burning
- Temperature change on its own

Chemical equation represents a chemical reaction:



Physical and chemical properties

Physical properties describe the physical form of a substance. They can involve physical changes

- Boiling point, freezing point, melting point
- Color, odor, taste, consistency
- Density

Chemical properties describe behavior of a substance in chemical changes (usually in presence of other chemicals or heat)

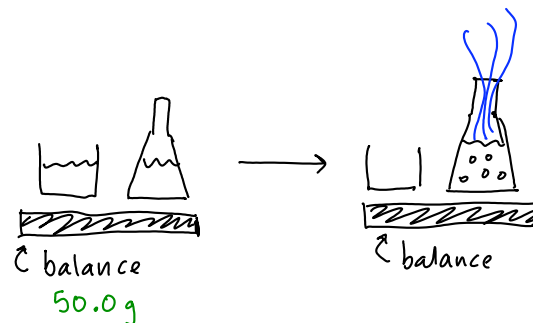
- Sodium fizzes and ignites in water
- Magnesium does not react with water

Identify the type of property:

- Baking soda will react with vinegar but not with water
- Baking soda is a fine, white powder
- Hydrogen is explosive

Law of conservation of mass

Law of conservation of mass: in a chemical reaction, matter can be neither...



Temperature

- Temperature:**
- measure of atomic or molecular motion
 - measured with...

<u>K</u>	<u>°C</u>	<u>°F</u>
Kelvin (SI unit)	degree Celsius	degree Fahrenheit
0	-273.15 °C	-459.67 °F
273.15	0 °C	32 °F
373.15	100 °C	212 °F

$$K = °C + 273.15 \quad \text{or} \quad °C = K - 273.15$$

$$38.0 \text{ °C} = ? \text{ K}$$

Fahrenheit/Celsius conversions

$$°F = \frac{9}{5} °C + 32 \quad \text{or} \quad °C = \frac{5}{9} (°F - 32)$$

$$82 \text{ °F} = ? \text{ °C}$$

$$82 \text{ °F} = ? \text{ K}$$