

### Matter and It's Properties

Matter → Anything that has mass & takes up space

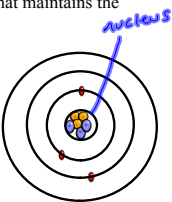
Mass → measurement of the amount of matter

Atom → The smallest unit of an element that maintains the properties of that element

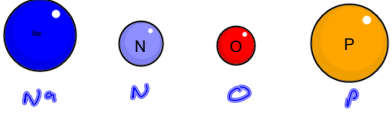
→ proton (+ charge)  $p^+$   
- found in nucleus

→ neutron (neutral charge)  $n$   
- found in nucleus

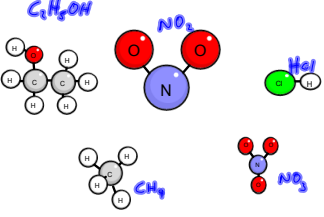
→ electron (- charge)  $e^-$   
- found in orbitals around nucleus



Element → A pure substance made up of only 1 type of atom



Compound → substance made of 2 or more types of atoms chemically bonded together



### Properties of Matter

**Intensive Properties** → A property that does not depend on the amount of a substance

- Density
- Boiling pt.
- Freezing pt.
- Ability to conduct heat & electricity
- Malleability
- ductility

**Extensive Properties** → A property that depends on the amount of a substance

- Weight
- Area
- Volume
- Mass
- Amount of energy
- Length

**Physical Property** → A characteristic that can be observed or measured without changing the identity of the substance.

- Texture
- Shape
- color
- Boiling pt / melting pt
- Density

**Chemical Property** → substance's ability to...

### Physical Change

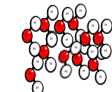
ANY CHANGE OF STATE

↓  
phase change

**Change of State**

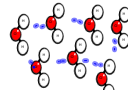
**Solid**

- Definite shape
- Definite volume



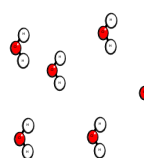
**Liquid**

- Definite volume
- Indefinite shape
- ↳ take shape of container that they are in



**Gas**

- Indefinite shape & volume



liquid → gas = evaporation  
 gas → liquid = condensation  
 solid → liquid = melting  
 liquid → solid = freezing  
 solid → gas = sublimation  
 gas → solid = deposition

Chemical Change → New substances

Also known as CHEMICAL REACTION

Reactants  
The substances that react in a chemical reaction  
Left of the arrow

Products  
The substance/substances that are created as a result of a chemical reaction

$KI + PbNO_3 \longrightarrow KNO_3 + PbI$

reactants                      products

Evidence of chemical change

- 1) color change
- 2) production of heat
- 3) production of a gas (bubbles)
- 4) formation of a precipitate  
↳ solid

Conservation of energy