Notes: Chapter 1 Describing Matter

matter	anything that has mass and takes up space the amount of matter in an object - measure as weight volume
different types of matter	substance - matter that has same make up and properties

Notes: Chapter 1 Describing Matter

matter has 2 kinds of properties

Physical Properties

a characteristic that can be observed without changing the substance

Chemical Properties

describes the ability of a substance to change into another substance.

atoms

All matter is made up of tiny particles called atoms

Notes: Chapter 1 Describing Matter

Atoms	made of protons, neutrons and electrons Protons -> positive charge neutrons -> neutral charge electrons -> negative charge
Elements	• matter made up of only one type of atom • simplest substances - cannot be broken down into any other substance • about 100 elements on earth - make up all matter on Earth and in universe

Notes: Chapter 1 Describing Matter

Elements	examples: • gold • helium • oxygen • copper
Combining atoms	atoms have the ability to combine to form new substances atoms combine with chemical bond force of attraction between 2 atoms
molecules	groups of 2 or more atoms held together by chemical bonds molecules have different properties than the elements that make them up

Notes: Chapter 1 Describing Matter

molecules	Examples: water: H_2O - hydrogen + oxygen carbon dioxide: CO_2 - carbon + oxygen
compound	• a pure substance made of 2 or more elements, chemically combined in a set ratio • compounds formed only with a chemical reaction - bond formed • compounds have different properties than the elements that form them • cannot be separated unless chemical bond is broken

Notes: Chapter 1 Describing Matter

chemical formula	formula that shows the elements in a compound and the number of each type of atom in that compound
mixtures	• mixture is made of two or more substances that are together, but not chemically combined • each substance keeps individual properties • substances NOT combined in a set ratio • mixtures can be separated easily, without breaking chemical bonds

H_2O

H_2O_2

H_3O_7

Notes: Chapter 1 Describing Matter

Heterogeneous Mixtures	Heterogeneous mixture - different parts of mixtures able to be seen - not evenly mixed ex. salad, chex mix
Homogeneous Mixtures	Homogeneous mixture - evenly mixed - can't see the different parts ex. lemonade, brass, pop

2 types of mixtures

Physical Change

A change in form or appearance but the substance stays the same

Changes of state

solid -> liquid = melting
liquid -> solid = freezing
liquid -> gas = evaporation
gas -> liquid = condensation

Changes in shape or form

physical change - changes appearance:
ripping, tearing, dissolving, crushing, grinding, bending

Chemical Change

chemical change changes the substance into 1 or more new substances with different properties

Signs of a physical change

- no new substance
- change in appearance - size, shape, state of matter

Examples of Chemical Change

1) combustion -
burning

2) Electrolysis
breaking apart or putting together substances using electricity

3) tarnishing -
substance reacts with another substance:
silver + sulfur in air-> tarnish
copper -> tarnishes

4) oxidizing
substance reacts with oxygen: rusting

Indication of Chemical Change

- New substance is made
- color change
- gas released (bubbles)
- odor
- light released
- heat released (feels hot)
- heat absorbed (feels cold)

Law of Conservation of Mass/Matter
Matter cannot be created or destroyed

-> it only changes form

33.59 – Poly B
56.4g – Poly A
54.4 – Total after

Energy - the ability to do work

Energy - all physical and chemical changes require a change in energy

Thermal energy always flows from warmer matter to cooler matter

Endothermic change	Exothermic change
Energy is taken in	Energy is given off
○ feels cold	○ feels hot
○ ex: ice melting	○ ex: fire burning

Ch. 2-1: States of Matter - Notes p. 42-47

visual

state of matter	properties
Solids definition: have a definite shape and volume	Particles in a solid: tightly packed in a fixed position 2 types of solids: 1. crystalline - particles form regular - repeating pattern 2. amorphous - particles do not form a regular, repeating pattern
Liquids definition: have a definite volume but not a definite shape	particles in a liquid: tightly packed but move freely properties of a liquid: surface tension: inward pull of molecules viscosity: resistance to flowing high viscosity - flow slowly low viscosity - flow fast
Gases definition: have no definite shape or volume	As gas particles move, they - spread apart to fill the space they are in

2-2: Changes of State

Changes in state occur when thermal energy increases or decreases.

List the states in order from least energy to most energy:

solid → (Increase in energy) → liquid → (Increase in energy) → gas

Label the states of matter and the changes that occur between states:

solid —melting→ liquid —vaporization, boiling, evaporation→ gas

solid ←freezing— liquid ←condensation— gas

solid —sublimation→ gas

reset page

Melting point - the temperature at which a solid becomes a liquid

Boiling point - the temperature at which a substance boils