Section 2.2

Properties of Matter

EQ: Why are color, volume, and density classified as physical properties?

§ 2.2: PROPERTIES OF MATTER

- Physical Properties:
  - Characteristics that can be observed without changing the identity of the substance.
  - Ex: color (yellow), mass (58.5 grams), volume (cm^3), shape (round), odor (new tennis ball smell), texture (fuzzy), state of matter (solid)

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EQ: Why are color, volume, and density classified as physical properties?

PHYSICAL PROPERTIES OF MATTER

- Physical Properties:
  - Can help identify substances
    - Ex: color, odor, texture, melting point, boiling point, mass, density (mass/volume)
  - Can be observed and measured
    - Ex: melting point, boiling point, mass, **density** (mass/volume), strength, hardness, strength, magnetism
  - Help determine uses
    - Ex: Aluminum is lightweight, flexible, & durable

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EQ: Why are color, volume, and density classified as physical properties?

DENSITY IS A PHYSICAL PROPERTY

- A measurement of how much matter is contained in a certain volume of a substance.
- Density = $\frac{\text{mass}}{\text{volume}}$
- Liquids or Solids: expressed in g / cm^3.
- 1 cubic centimeter = 1 milliliter
- Density of water = 1 g / cm^3

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EQ: Why are color, volume, and density classified as physical properties?

DENSITY IS DIFFERENT FROM WEIGHT

- When comparing objects of the <u>same volume</u>, more dense objects feel heavier than less dense objects do.
- When comparing objects of the <u>same mass</u>, less dense objects take up more space than more dense objects do.
- However, when comparing different volumes or mass, there is no relationship between the two.

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EQ: Why are flammability and reactivity classified as chemical properties?

CHEMICAL PROPERTIES OF MATTER

- Chemical Properties:
  - Describes how a substance changes into a new substance, either by combining with other elements or breaking apart into new substances.
  - Ex: Flammability, reactivity with water, acids, bases, or heat

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EQ: Why are flammability and reactivity classified as chemical properties?

PHYSICAL AND CHEMICAL PROPERTIES ARE DIFFERENT

- Physical Properties:
  - Can be observed without changing the identity of the substance.
- Chemical Properties:
  - Can only be observed when the identity of the substance changes.

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