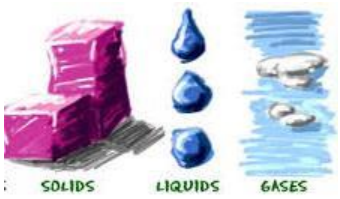
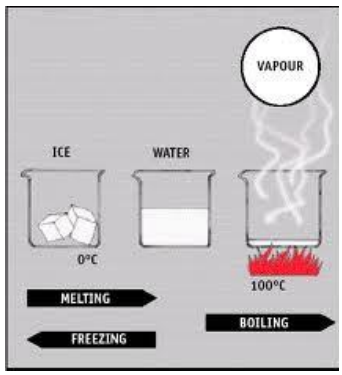
Week 9 – SCIENCE NOTE PAGE
Physical Properties and Changes

Physical Properties of Matter

- **Physical properties:** the properties of a substance that can be measured or observed **without** changing the chemical makeup of the substance.
  - In other words, no chemical _____ are made or broken.
  - The original matter may change shape or form, but the matter **remains** the _____ substance.
  - Physical properties are constant for any type of matter and can be used to _____ the matter.
    - **Examples** of **physical** properties include:



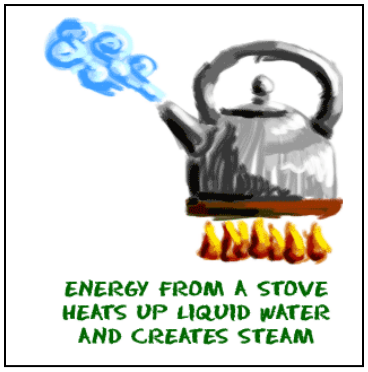


  - **State of Matter:** solid, liquid, gas
  - **Mass**: measures the amount of _____ in an object
    - Measured in grams (g), kilograms (kg)
  - **Volume**: measures the amount of _____ an object takes up
    - Measured in liters (L), milliliters (mL), centimeters cubed (cm^3)
  - **Melting point**: temperature at which a solid becomes a _____
    - Melting points are constant for any given type of matter
      - Example: Water melts above 0°C (32°F)
  - **Boiling point**: temperature at which a liquid becomes a _____
    - Boiling points are constant for any given type of matter
      - Example: Water boils at 100°C (212°F)
  - **Density**: mass per unit of volume or the amount of matter in a given space
    - Measured in grams/milliliter (g/mL) or grams/centimeter cubed (g/cm^3)
  - Sometimes, **physical characteristics** can be physical properties – but sometimes physical characteristics change and are _____ reliable in identifying a substance.
    - **Examples** of physical characteristics include, but are not limited to:

○ Shape ○ Color ○ Size ○ Texture

Physical Changes

- **Physical changes** occur when only the **speed** or **spacing** of molecules and/or atoms changes – **because _____ is added or removed** (adding or removing heat)!
  - the compounds or elements present remain the _____
- **Examples:** *melting, boiling, folding, and cutting*
  - SPECIFIC Examples of physical changes:
    - **Dropping a glass:** the glass breaks, but the broken pieces are still made of glass
    - **Ice melting:** the molecules are still water molecules – they just move more freely in liquid form than in ice
    - **Sugar in Water:** Sugar dissolves, but no bonds of sugar molecules are broken – the molecules just spread out through the water



PREVIEW:

- **Chemical Changes** – occur when atoms **form or break bonds** with each other
- **Nuclear Changes** – occur when the nucleus of an atom changes and produces **new elements**