Vocabulary: Phases & Changes of Matter, Part 1

solid: A state of matter that has a definite shape and a definite volume.

- The particles of a solid vibrate in place (sort like when we jog in place)
- The particles of a solid are packed very closely together.
- There are two types of solids:
  - crystalline solids: The particles form a regular, repeating pattern which create crystals (e.g., salt, sugar, snow)—melts at a specific temperature.
  - amorphous solids: The particles are not arranged in a regular pattern (e.g., plastics, rubber, glass)—does not melt at a specific temperature.

liquid: A state of matter that has no definite shape, but has a definite volume.

- Particles in a liquid are spaced almost as closely as in a solid, but the particles in a liquid move around one another freely—they slide around one another, but stay in contact.
- Since a liquid's freely moving particles allow it to flow from place to place, it is also called a fluid, meaning "a substance that flows."
- Properties of liquids:
  - Surface tension – the result of an inward pull among the molecules of a liquid that brings the molecules on the surface closer together and causes the surface to act as if it has a thin skin
  - Viscosity – a liquid's resistance to flowing

gas: A state of matter that has no definite shape or volume.

- Like a liquid, a gas is a fluid, but they change volume much more easily

melting: The change in state from a solid to a liquid.

- In most pure substances, melting occurs at a specific temperature, called the melting point.
- As a solid is heated, the added thermal energy makes the molecules vibrate faster, raising their temperature. At its melting point, the particles of a solid substance are vibrating so fast that they break free from their fixed positions—the solid becomes a liquid.
- ***Freezing*** is the opposite of melting

vaporization: The change in state from a liquid to a gas—takes place when the particles of a liquid gain enough energy to form a gas.

- There are two main types of vaporization:
  - Evaporation – vaporization that takes place only on the surface of a liquid
  - Boiling – vaporization that takes place inside the liquid as well as on the surface
    - The temperature at which a liquid boils is called its boiling point
- ***Condensation*** is the opposite of vaporization

sublimation: The change in state from a solid directly to a gas without passing through the liquid state.

- Dry ice (solid carbon dioxide) is an example of a substance that changes from a solid directly into a gas
- ***Deposition*** is the opposite of sublimation