Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_\_

CHANGES OF STATE

What are Changes of State?



* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Changes
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ changes
* Examples:
	+ Melting
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ Sublimation
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ Vaporization

Energy, Temperature & Changes of State

* Energy is always involved in changes of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Matter either \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_energy when it changes state.
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** – the average kinetic energy of the particles of matter.

Changes between Liquids & Solids

* **Freezing** – liquid changing into a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Liquid particles lose energy until they no longer \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ each other.
* Once in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ position they become a solid
* **Freezing point** – the temperature at which a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_changes into a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ Example: Water 0°C (32°F)

Melting

* **Melting** – when \_\_\_\_\_\_\_\_\_\_\_\_\_\_ changes into a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **Melting point** – the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at which a solid changes to a liquid.
* Melting point is the same as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ point.
* **Heat of fusion** - the amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ required to change a substance from the solid phase to the liquid phase at its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Changes between Liquids and Gases

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**– liquid changes to a gas
	+ point at which the liquid breaks free of all attractive forces and changes into a \_\_\_\_\_\_\_\_\_\_\_\_\_
		- 2 ways
			* **evaporation** (happens at the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of the liquid) particles break away into the air without boiling
			* boiling (throughout \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_substance)
* **Boiling point**
	+ the temperature at which the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the liquid is equal to the external pressure acting on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of the liquid
* **Heat of vaporization**
	+ the amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_required for the liquid at its boiling point to become a \_\_\_\_\_\_\_\_\_\_

Condensation

* **Condensation** – gas changes to a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Water vapor cools, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, forms droplets
* Examples: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Changes between Solids and Gases

* **Sublimation** – solids change \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to a gas (without going through being a liquid)
* Example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Deposition

* **Deposition** – gas changes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to a solid without going through the liquid state.
* Example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Heat Curve or Phase Diagram



**Temperature remains constant during a change in state.**