LO: Students will understand the relationship between energy and changing states of matter.

DOL: Students will successfully explain specific heat, fusion, and vaporization concepts at least 4/5 times.

Feb 8-9:17 AM

Changes in State of Matter Vocabulary

**phase** - any part of a system that has uniform composition and properties

**condensation** - gas to a liquid

**equilibrium** - a dynamic condition in which two opposing changes occur at equal rates in a closed system

**equilibrium vapor pressure** - pressure exerted by a vapor in equilibrium with its corresponding liquid at a given temperature

an increase in temperature will increase the equilibrium vapor pressure

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**volatile liquid** - liquids that evaporate readily

**boiling** - conversion of liquid to vapor both within the liquid and at the surface

boiling doesn't always mean hot,

https://www.youtube.com/watch?v=Sx_8dJ633wg

**boiling point** - the temperature at which the equilibrium vapor pressure of the liquid equals the atmospheric pressure

**molar enthalpy of vaporization** - amount of energy as heat that is needed to vaporize one mole of liquid at the liquid's boiling point at constant pressure

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**freezing** - liquid to a solid

**freezing point** - temperature at which the solid and liquid are in equilibrium at 1 atm

**molar enthalpy of fusion** - amount of energy as heat required to melt one mole of solid at the solid's melting point

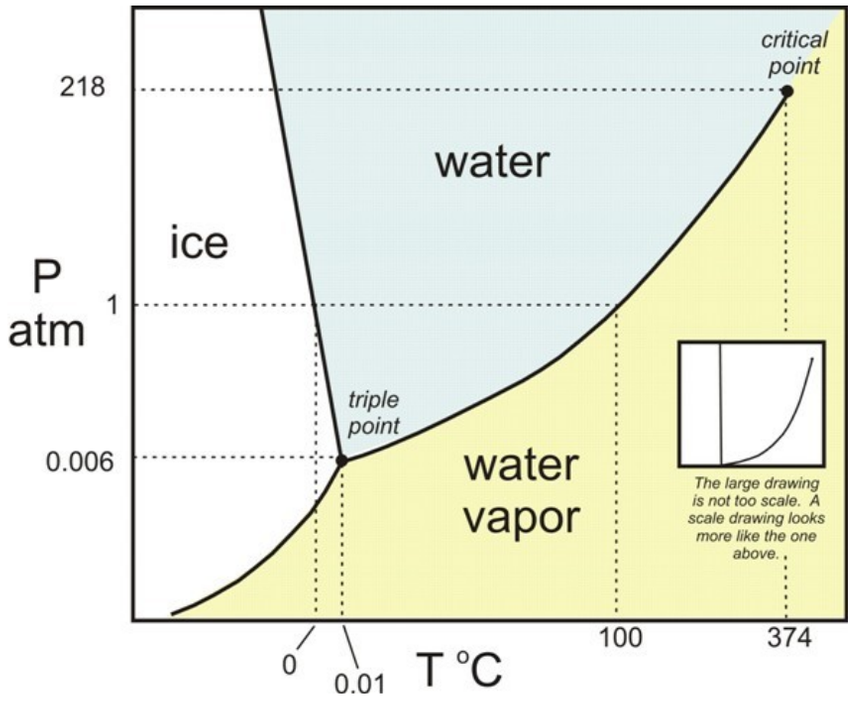
**sublimation** - solid to gas

**deposition** - gas to solid

**triple point** - solid, liquid, and gas coexist at the same temp / pressure

**Specific Heat (c)**
the heat required to raise the temperature of the unit mass of a given substance by a given amount (usually one degree).

Feb 8-9:27 AM




Feb 8-9:34 AM

# The triple-point of water:

https://www.youtube.com/watch?v=r3zP9Rj7Inc

Energy for changing water -

Molar enthalpy of fusion = 6.02 kJ / mol

Molar enthalpy of vaporization = 40.7 kJ / mol

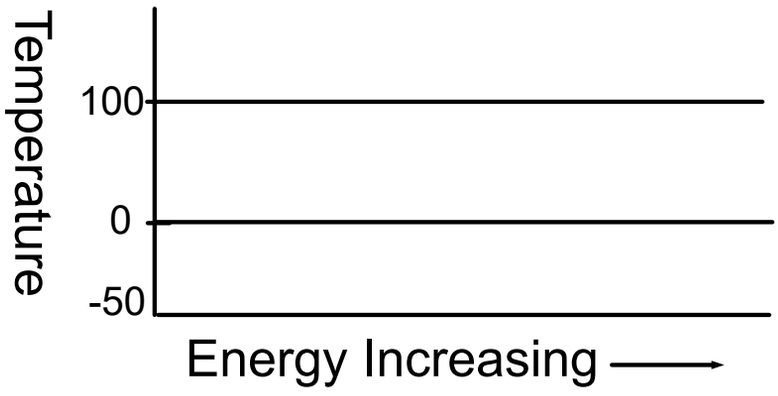
Specific Heat liquid = 4.18 J / (g(K))

Specific Heat gas = 1.87 J / (g(K))

Specific Heat solid = 2.06 J / (g(K))

Feb 8-9:44 AM

Graphic Analysis of Heating up water (we will fill this graph in during class).



Based on the graph on the previous slide, why do steam burns hurt more than boiling water splashing on you?

Determining Specific Heat from experimental data.

$Q = mc\Delta T$ where m is the mass

$\Delta T$ is the change in temp,

Q is heat energy

and c is specific heat

Feb 11-7:02 AM