

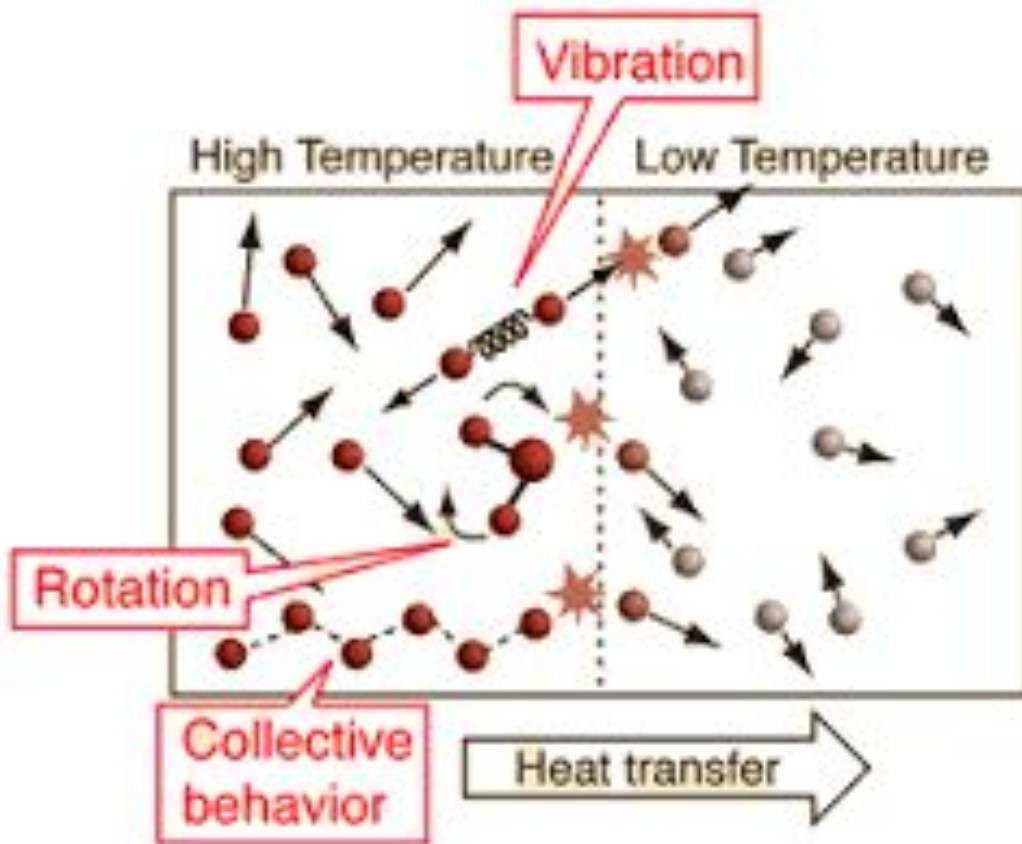


Temperature

Section 1

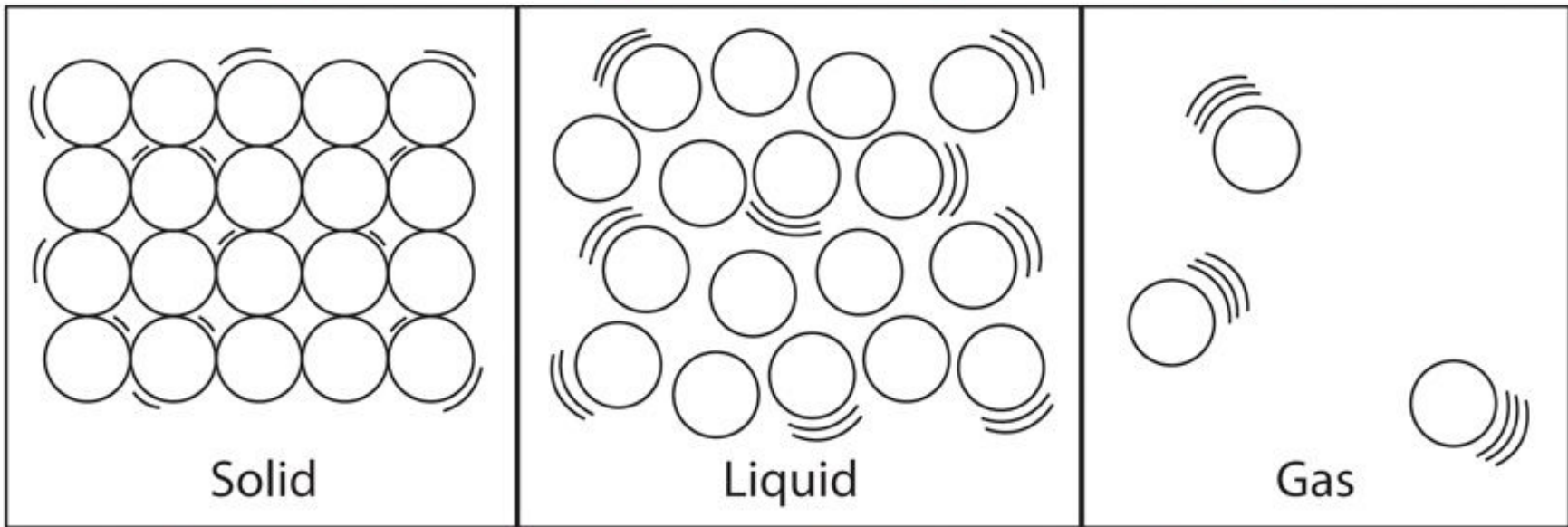
I. Temperature

	Definition:	This Means:
Temperature	The degree or intensity of heat present in a substance or object	How hot or cold something is
	In other words, The amount of energy in an object or system	Celsius to Fahrenheit $F = 9/5 (C) + 32$ Fahrenheit to Celsius $C = 5/9 (F - 32)$
	Tool used to measure temperature: Thermometer	Units: Fahrenheit (F) Celsius (C) Kelvin (K)



- Faster vibrating molecules mean higher energy.
- Slower vibrating molecules mean lower temperatures
- More vibrating molecules more heat
- Less vibrating molecules less heat

ADD ENERGY



REMOVE ENERGY



Celsius to Fahrenheit Conversion Example

Dry ice is $-78.5\text{ }^{\circ}\text{C}$. What is the temperature in Fahrenheit?

$$^{\circ}\text{F} = 1.8^{\circ}\text{C} + 32$$

$$^{\circ}\text{F} = (1.8)(-78.5) + 32$$

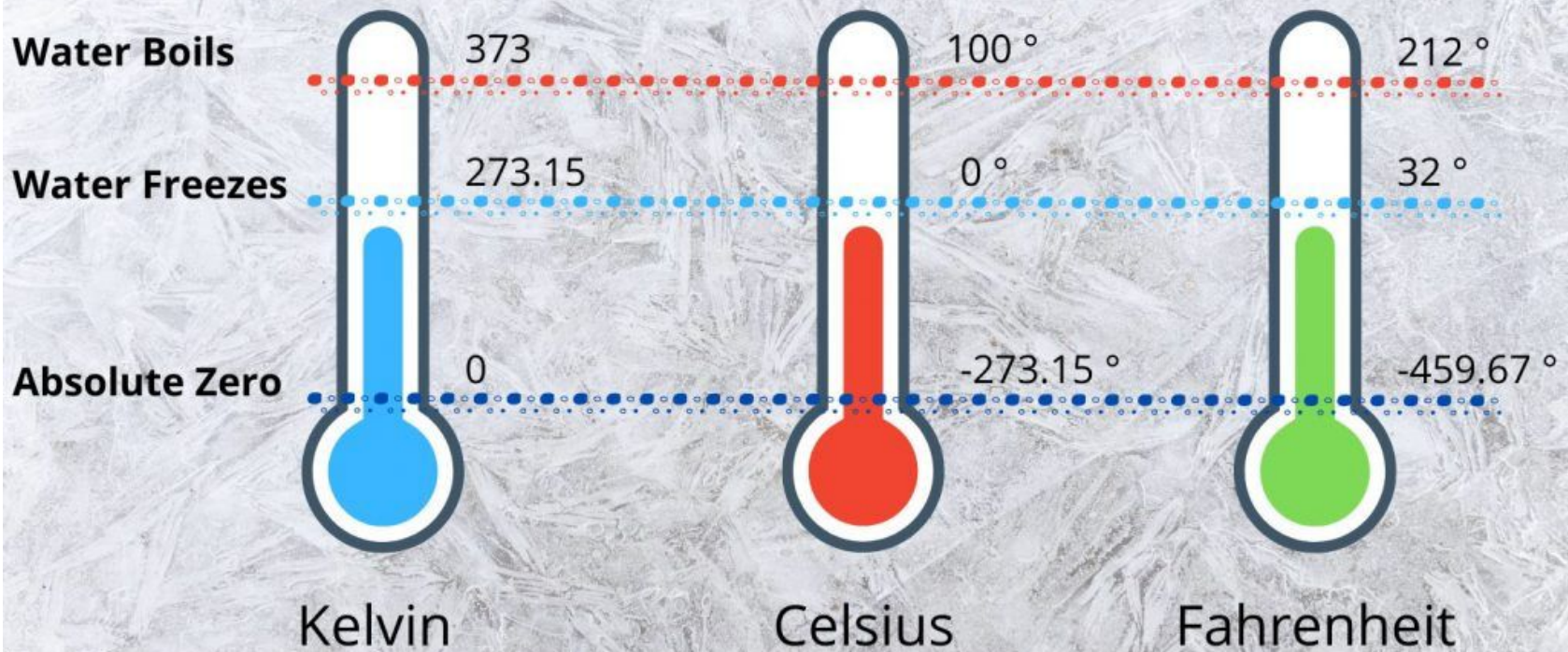
$$^{\circ}\text{F} = -141.3 + 32$$

$$^{\circ}\text{F} = -109.3$$



Absolute Zero

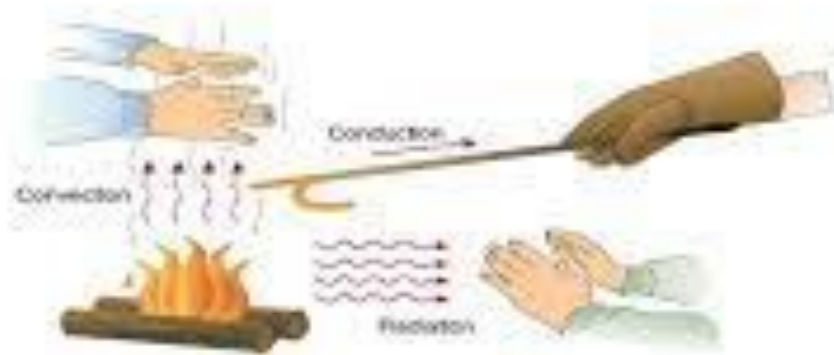
Kelvin, Celsius, and Fahrenheit



	Definition:	This Means:
Heat	Energy transferred from one object or system to another	Flow or movement of energy

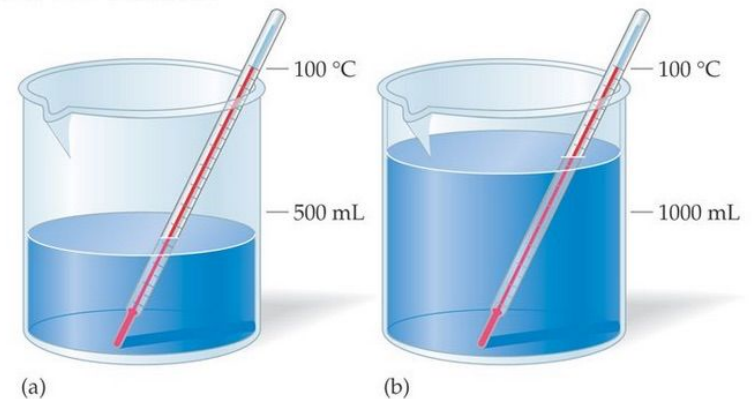
What is Heat?

Heat is the transfer of thermal energy from one object to another object, when the objects have different temperatures.



Heat vs. Temperature

- Although both beakers below have the same temperature ($100\text{ }^{\circ}\text{C}$), the beaker on the right has twice the amount of heat, because it has twice the amount of water.

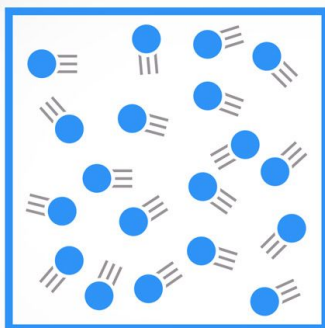


Heat and temperature are related by they are not the same. Temperature depends on how fast molecules vibrate and heat depends on how fast molecules vibrate and also the # of molecules.

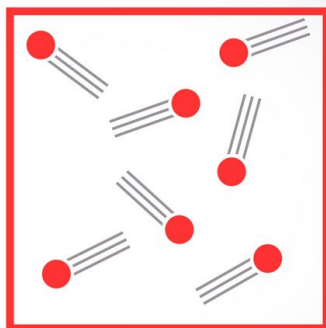
II. Heat & Density

Heating something up speeds up molecules making an object less dense. Cooling (removing heat or energy) slows down molecules making them more dense.

Molecule Energy



Cold Air



Hot Air

II. Heat & Heat Transfer

Definition:

Movement of energy from
one place to another

Example:

Holding a hot cup
Sunlight
microwaves
plate tectonics

Thermal Equilibrium=

No energy is transferred between two objects or systems

Whenever thermal equilibrium is reached, no movement occurs

Heat
Transfer

III. Thermal Expansion

	Definition:	Example:
Thermal Expansion	Increase in volume as temperature increases	Thermometers bridge expansion air in tires lids stuck on jar

Expansion

- When heated, the particles (atoms or molecules) in a substance vibrate more and **move apart** to occupy more space
- So the size and volume increases but *the size of the particles remains the same.*
- *When cooled, they contract.*

