

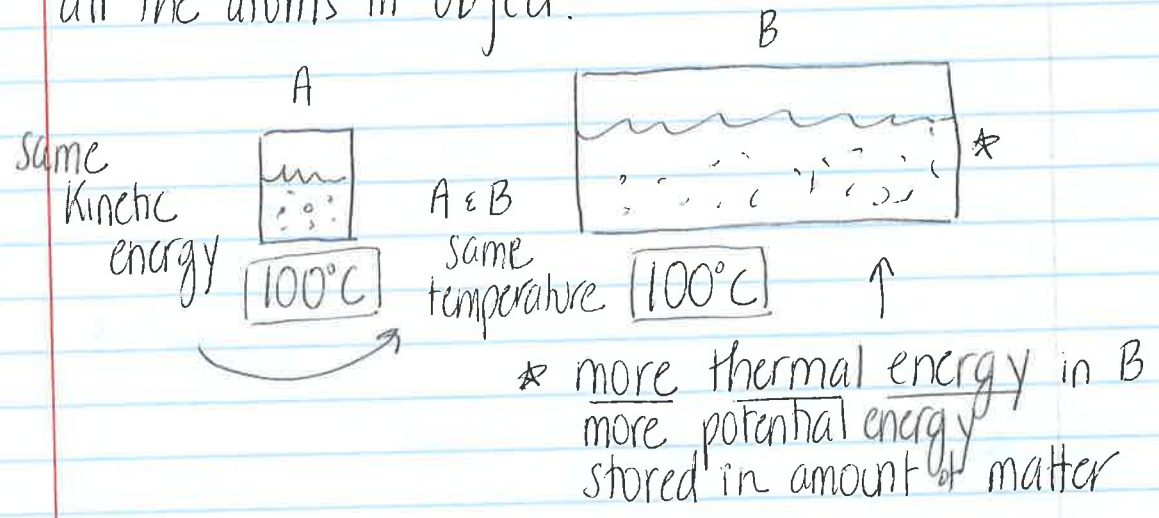
Chap 9: Heat

Heat is thermal energy that is moving.

Heat transfer - heat flows from systems with a high temperature to a lower temperature until equilibrium is reached.

The metric unit for measuring heat and energy is the Joule. Symbol = J

Thermal Energy - sum of kinetic (moving) energy and potential (stored) energy of all the atoms in object.



Specific Heat

The specific heat is a property of a substance that tells how much heat is needed to raise the temperature of 1 kg of the material by 1°C .

Thermal Energy Equation

$$Q = m c \Delta t$$

\uparrow thermal energy (J)
 \uparrow mass of substance (kg)
 \uparrow specific heat $\left(\frac{\text{J}}{\text{kg}^{\circ}\text{C}}\right)$
 (change in temperature) $(^{\circ}\text{C})$

9.2 Heat Transfer

READ

Thermal energy flows from higher temperature to lower temperature. This process is called heat transfer. Heat transfer can occur three different ways: heat conduction, convection, and thermal radiation. Using section 9.2 of your student text as a guide, define each method of heat transfer.

Heat conduction:

The transfer of heat by the direct contact of particles of matter.

Ex: hot cocoa transfers heat \rightarrow mug \rightarrow hand

Convection:

The transfer of heat through the motion of matter through air and liquid. (circulation of matter)

Ex: Warm air rises; warm water rises.

Thermal radiation:

Heat transfer by electromagnetic waves - includes visible light.

All objects with a temperature above 0K emit thermal radiation.

Ex: Sun's rays warm Earth.

high c_p = slow temp. change H_2O
 low c_p = rapid temp. change vs. Fe