

Methods of Heat Transfer

There are 3 methods of heat transfer:

① CONDUCTION :

- transfer of heat from a warmer substance to a cooler substance
- through direct contact.

* when 2 substances come into contact



* particles collide



* energy from faster-moving particles is transferred to slower-moving particles



* until particles in both substances are moving at the same speed & temperature has equalized.

② CONVECTION :

• transfer of heat in a fluid through currents

• fluids = gases OR liquids

* fluid heats up



* molecules become less dense as they spread out



* molecules rise & displace cold



* cold sinks

warmer rises

cool water sinks

CONVECTION CURRENT

(movement of water that results)

3. RADIATION

- transfer of energy as electromagnetic waves.
- DOES NOT need collision or movement of particles
- can occur through empty space.

Insulators & Conductors Readings

Thermal Conductor: material that allows energy in the form of heat to be transferred within the material, without any movement of material itself.

- MAXIMIZES thermal energy transfer.

Thermal Insulator: material that prevents ~~heat~~ from being transferred.

- MINIMIZES thermal energy transfer.

- * Difference is how easy it is to make the particles of the material vibrate.
- * Metals are good @ transferring thermal energy (as are many liquids)
→ metals are usually good conductors

- The best insulator is a completely empty space - often called a vacuum - that has no air in it.
→ no particles → no vibrations

* gases are often good insulators because particles are farther apart.

Ex: air bubbles
(honeycomb design)
dry wood.