Conduction, Convection and Radiation Figure 2--Conduction, Convection, and R





Thermal Energy Transfer

Thermal energy transfer is heat moving from a warmer object to a cooler object. This is known as thermal energy transfer.



How is Heat Transferred?

There are THREE ways heat can move.



CONDUCTION

- Heat is transferred from one particle of matter to another in an object without the movement of the object.
- Conduction = CONTA

Have you ever...

Touched a metal spoon sitting in a pan of boiling water only to be surprised by HOW hot it is??





Think back to what you know about metals and nonmetals. What conducts heat better, metal or nonmetal? Why?

- Think of a metal spoon in a Example of pot of water being heated. Conduction
 - The fast-moving particles of the fire collide with the slow-moving particles of the cool pot.
- Because of these collisions, the slower particles move faster and heat is transferred.
- Then the particles of the pot collide with the particles in the water, which collide with the particles at one end of the spoon.
- As the particles move faster, the metal spoon



EXAMPLE OF CONDUCTION

A piece of cheese melts as heat is transferred from the meat to the cheese (Contact)



CONVECTION

- Convection is the movement that transfers heat within fluids and air (gas)
- Heat is transferred by currents within the fluid or gas
- Convection = VENTS (through air and liquid particles)
- Convection moves in a circular pattern



Examples of Convection:

- Have you ever noticed that the air near the ceiling is warmer than the air near the floor? Or that water in a pool is cooler at the deep end?
- Examples: air movement in a home, pot of heating water.
- Pick one of these examples and draw the circular pattern in your notes.



RADIATION

- Radiation is the transfer of energy by electromagnetic waves
- Radiation does NOT require matter to transfer thermal energy
- Radiation = Radiates (heat escaping the sun)



Radiation May Come From Other Sources Have you ever sat too close to a campfire

while cooking marshmallows? You're enjoying the warmth only to notice that your skin is really warm?



Examples of RADIATION

- 1. Fire
- 2. Heat Lamps
- 3. Sun



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*Transferred in rays or waves	*Transfer of heat (energy) that happens when molecules bump	*Transfer of heat by the flow of material	
*Enerav from the	into each other	*In warm air, the molecules move apart,	
Sun warms the Earth	*Objects must be touching	so it is less dense and rises	
	*"Conduction is touchin'"	*In cooler air, the molecules move closer together, so it is more	
<u>Exampl</u>	<u>Exampl</u>	dense and sinks <u>Exampl</u>	
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