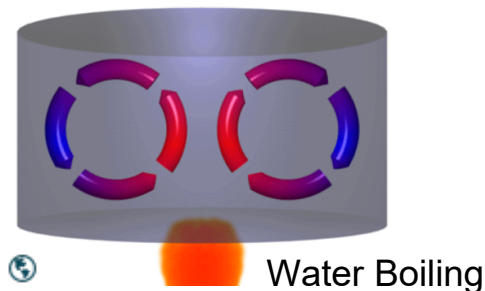


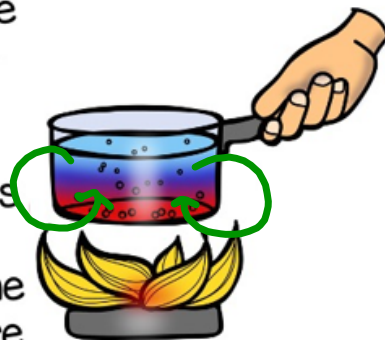
Convection - is the movement of heat because of the movement of warm matter (Liquid or gases). Warmer molecules move away from the heat source and gets replace by the colder ones. (Heated by a heat source)

For example, atmospheric circulation moves warm air to cool places, causing wind. Wind, in turn, can enter and cool a room if the window is open. The movement of the clouds, the ocean currents and many types of heaters are examples of convection.



Water Boiling

Convection takes place when warm particles move in currents, or waves. For example, when a pot of water is boiled, the water particles closest to the bottom of the pot are heated the most.



The cooler water particles drop to the bottom of the pot and take the place of the heated ones. So, the heat transfer is taking place because of the movement of the warm particles.



Radiation -is heat that is moved from one place to another by electromagnetic radiation waves or rays. It may be felt as heat or

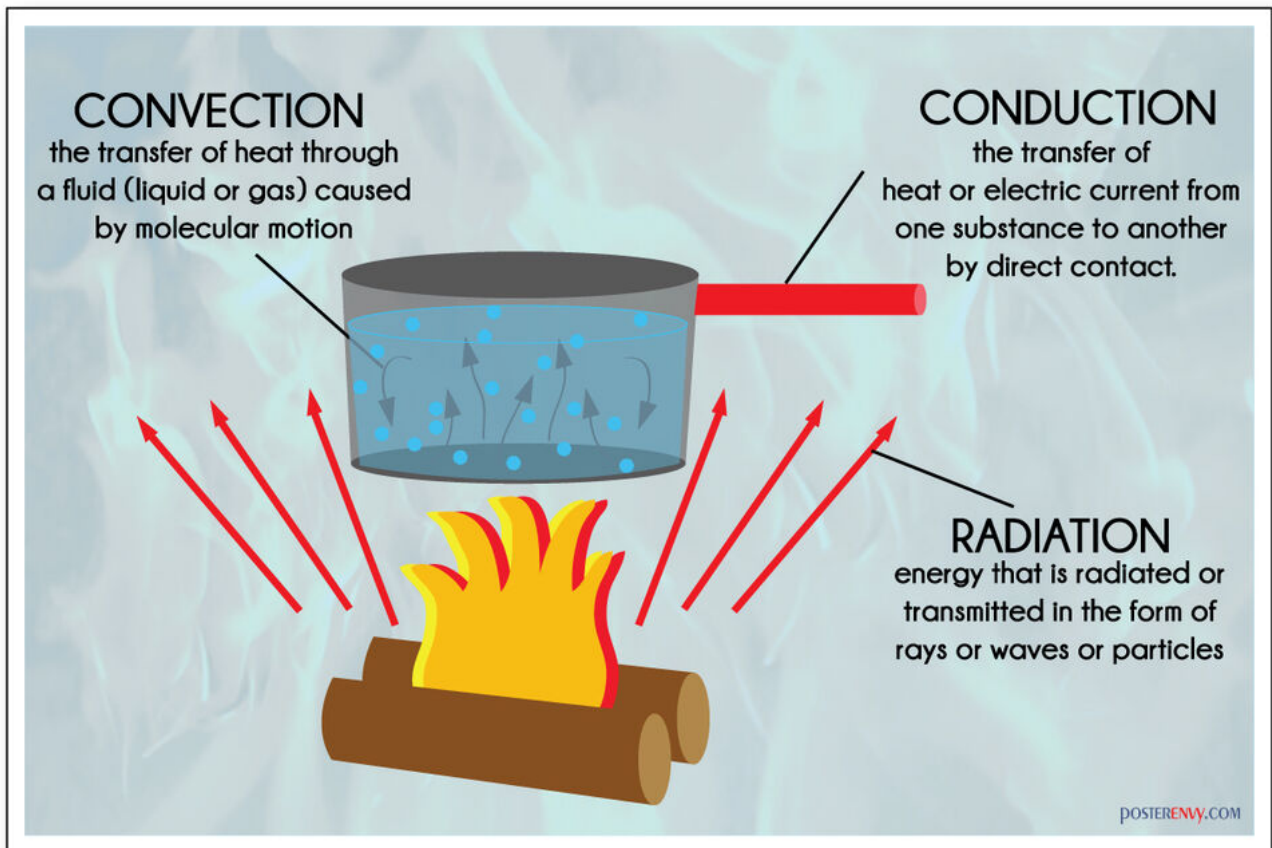
seen as light. It does not require to be transfer through something.

Dark, dull surfaces give out more thermal radiation while bright and shiny surfaces give out comparatively less thermal radiation. Those surfaces which give out thermal radiation well also absorb thermal radiation well. For example a person in front of a fire can warm up because of the light of the fire, even if the air is cold.

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Another example of thermal radiation is the heat that comes from the Sun to the Earth.





## What are the following?

1. When the water vapor fogs the glass of a bath, by the hot temperature of the water when bathing



- 2) When you pour hot cocoa into a cool mug, heat moves from the cocoa into the mug.



- 3) When you stick a fork into a hot food, heat moves from the food into the fork.



- 4 ) Heating food in a microwave



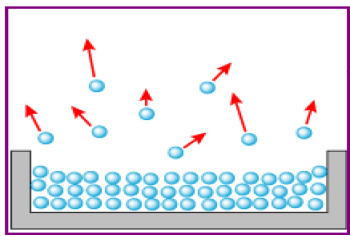
# HEAT TRANSFER

**CONVECTION:** *How does a glider fly?*  
 Convection is the method of heat transfer through **FLUIDS (liquids & gases)**  
 The particles in the fluid gain energy, **move faster** and **spread apart**  
 This causes the warmer parts of the fluid to **expand** and **become less dense**  
 The **warmer fluid rises** and cooler fluid takes its place  
 The process repeats and we now have a **convection current** flowing

**CONDUCTION:** *Why do we make our cooking pans out of metal?*  
 Conduction is the method of heat transfer through **SOLIDS**  
 Metals are much better at conducting heat because they contain **free electrons**  
 This is because the ions and free electrons **gain kinetic energy** from the heat source  
 The free electrons transfer energy by **collisions** with ions. Energy is also transferred by collisions between neighbouring vibrating ions

**RADIATION:** *How does the Sun's energy reach us?*  
**ALL** objects **emit** infra-red radiation  
 The **hotter** the object the **more** radiation it gives off  
 Infra-red radiation is a wave found in the **electromagnetic spectrum** and can travel through a **vacuum**

**TOP TIP:**  
**Dark, matt** surfaces are **good absorbers** and **good emitters** of infra-red radiation whereas **light, shiny** surfaces are **good reflectors**



**EVAPORATION:** *Why does your skin feel cold when a liquid evaporates off it?*  
 The particles with the **most energy** will be able to break away from the other particles  
 These particles **escape** from the surface of the liquid  
 So the **average energy** of the remaining particles goes down  
 And the **lower the average energy** of molecules the **lower the temperature** of the liquid

**KEY WORDS:**  
**CONDUCTION, CONVECTION, RADIATION, FREE ELECTRONS, INSULATORS, EMITTERS, ABSORBERS, REFLECTOR, DENSE, FLUID, CONVECTION CURRENT, EVAPORATION**

