

Energy Transfer & Conservation

Hot Objects Expand



When something gets hotter it will expand, or get bigger. At the same time, when something gets colder it will shrink. This property is used to make mercury thermometers. The line in the thermometer is actually liquid mercury. As the liquid gets hotter, it will expand and rise in the thermometer to show a higher temperature. It's the expansion and contraction due to temperature that allows the thermometer to work.

Matter Changing State



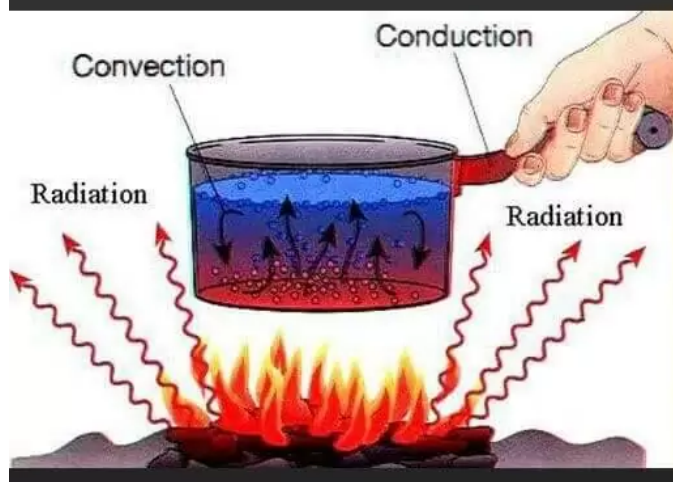
Heat has an impact on the state of matter. Matter can change state based on heat or temperature. There are three states that matter can take depending on its temperature: solid, liquid, and gas.

For example, if water is cold and its molecules are moving very slow, it will be a solid (ice). If it warms up some, the ice will melt and water becomes a liquid. If you add a lot of heat to water, the molecules will move very fast and it will become a gas (steam).

HEAT

VS

TEMPERATURE



[Heat transfer Facts for Kids \(kiddle.co\)](http://kiddle.co)

Heat moves from the hotter body (higher temperature) to the colder one (lower temperature). The bodies in question may be in a [solid](#) state, a [liquid](#) state or a

There are three modes of heat transfer:
[conduction, convection and Radiation](#)

Conduction -(or thermal conduction) is the movement of heat from one object to another one that has different temperature when they are touching each other. (Physical contact)

For example, we can warm our hands by touching hot-water bottles. When the cold hands touch the hot-water bottle, heat flows from the hotter object (hot-water bottle) to the colder one (hand).



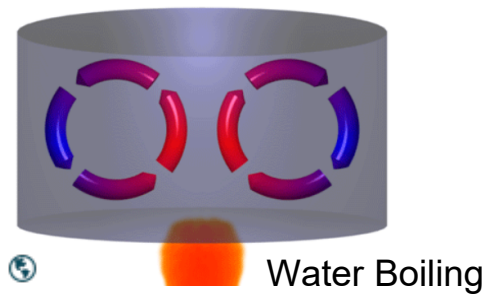
Metal conduct heat more than wood.

(Think of touching a metal spoon vs wooden spoon when stirring a pot on the stove.)



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.



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.