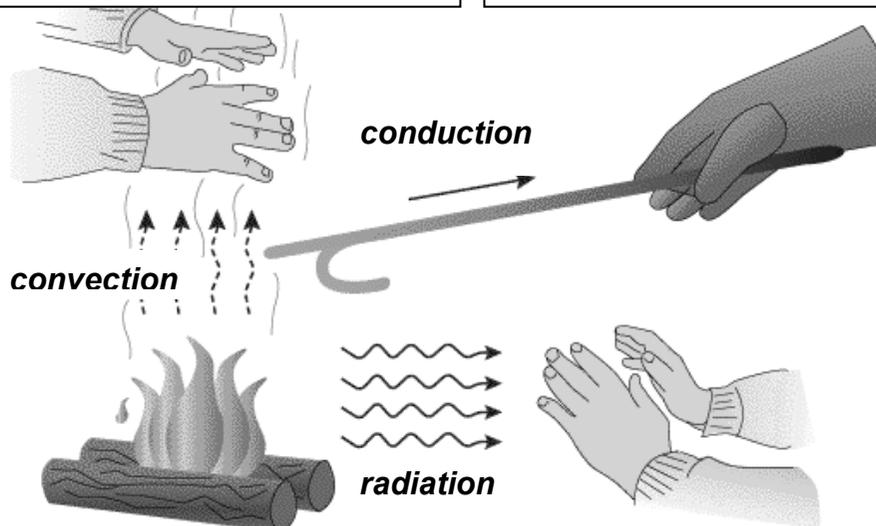


**HEAT** - Heat is the thermal energy transferred from one thing to another thing because of the temperature difference between them and that the direction of energy flow is *always* from a warmer thing to a cooler thing. The temperature of a sample of matter is a measure of the average kinetic energy of the molecules in that sample. A big block of metal and a small block of metal taken out of an oven have the same temperature, but the big block has more heat energy in it.

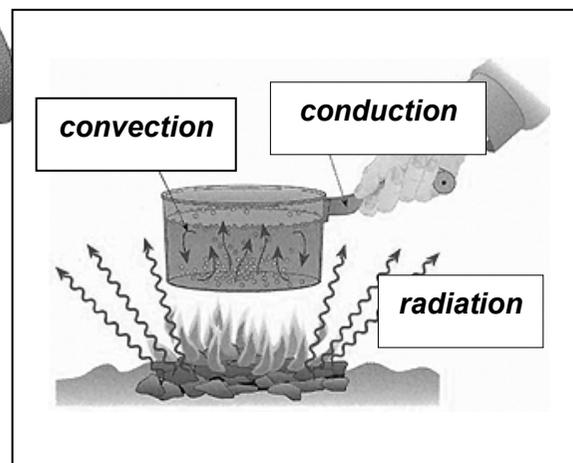
**CONVECTION** - Convection is name of the most important kind of heat transfer that happens in liquids and gases.

A convection current is a movement of part of a liquid or a gas when it is heated. Heat is carried by parts of the liquid or gas because it expands and becomes less dense. For example, the air in a room near a heater has hotter parts that are forced upwards by the surrounding air, which is cooler. As it goes up, the cooler parts move down. Don't say "HEAT RISES"!!

Demonstrate understanding of aspects of heat **AS 90939**  
Heat transfer via conduction, convection and radiation.



**CONDUCTION** - Conduction is the flow of heat through materials from where they are hot to where they are colder. Metals are good conductors of heat. Wood, glass, plastics, rubber, cotton and leather are bad conductors. Good conductors are bad insulators; bad conductors are good insulators. Everything conducts to some extent - Liquids and gases also conduct heat but only very slowly. Water is a very poor conductor. Metal objects feel cold if you touch them because they carry heat away from your hand. Air is a poor conductor and clothes which trap air eg fleeces are warm. Fibreglass is also a very bad conductor and is used as 'lagging' to insulate water pipes, ovens, fridges and the roofs and walls of houses.



**INSULATION** - insulation can reduce unwanted energy transfer. The main reason why any type of insulation works is because air is trapped in fibres, or within bubbles or similar cavities in a material like fibre glass or polystyrene. Air is a poor conductor of heat so little is stored in it and the layer of air is a barrier to the transfer of heat. Insulation in homes cuts down the loss of heat by reducing the effect of the three types of heat transfer - CONDUCTION, CONVECTION and RADIATION.

**RADIATION** - Radiation is totally different from conduction and convection. It does not need any matter to be present. It can travel through a vacuum, so it is the way heat reaches us from the sun. Some surfaces absorb radiation better than others, for example, Black, dull surfaces are better at absorbing radiation. White and shiny surfaces are poor absorbers, and instead of absorbing they make good reflectors of radiation. Some surfaces also give out, or emit, radiation better than others when they are hot. A dull black surface is a better emitter of radiation than the shiny one. Radiation is emitted by all objects. It is mostly infrared radiation. When radiation hits an object the bit of radiation that is absorbed raises the temperature of the object.