

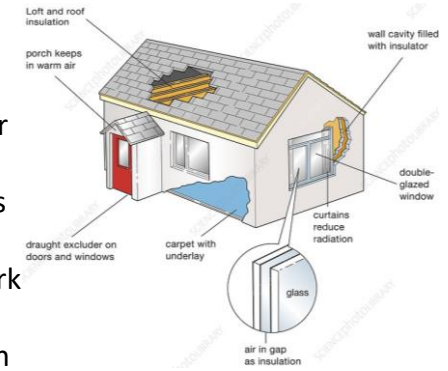
Keywords

Thermal conductor	Material that allows heat to move quickly through it.
Thermal insulator	Material that only allows heat to travel slowly through it.
Temperature	A measure of the motion and energy of the particles.
Thermal energy	The quantity of energy stored in a substance due to the vibration of its particles.
Conduction	Transfer of thermal energy by the vibration of particles.
Convection	Transfer of thermal energy when particles in a heated fluid rise.
Radiation	Transfer of thermal energy as a wave.

Heating, cooling & work done

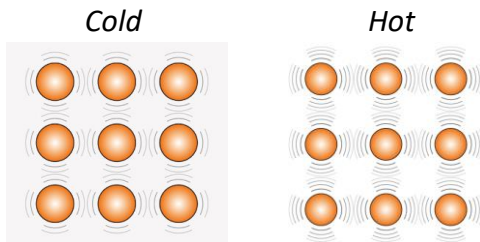
4. Reducing energy loss (insulators)

An insulator is a material that does not transfer heat well. Insulators in homes slow down the transfer of heat from the warmer internal rooms the cooler outside. The way insulators work is by preventing conduction, convection and radiation.



1. Conduction

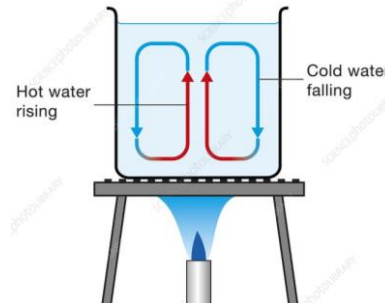
This method of energy transfer occurs in solids. As you heat up a solid, the particles gain kinetic energy and vibrate more.



In metals, there are free electrons that can carry a current. It is why metals are good conductors.

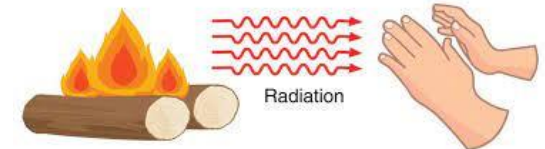
2. Convection

This method of energy transfer occurs in fluids (liquids and gases). When the particles are heated, they gain kinetic energy and move faster. This makes the fluid expand, become less dense and rise.



3. Radiation

Thermal energy is transferred by infrared (thermal) radiation. It travels in waves just like light and does not require particles. The hotter the object, the more radiation it emits. A darker object absorbs radiation and a lighter object reflects radiation.



Keywords

Work	The transfer of energy when a force moves an object, in joules.
Machine	Apparatus using mechanical power.
Lever	A type of machine which is a rigid bar that pivots about a point.
Input force	The force you apply to a machine.
Output force	The force that is applied to the object moved by the machine.
Displacement	The distance an object moves from its original position.
Deformation	When an elastic object is stretched or squashed, which requires work.
Fulcrum	The point or support on which a lever pivots.

5. Work

Energy can be transferred from store to store by forces moving. When this happens, mechanical work is done.

We can work out how much work has been done by using this formula:

Work done (J) = force (N) x distance (m)

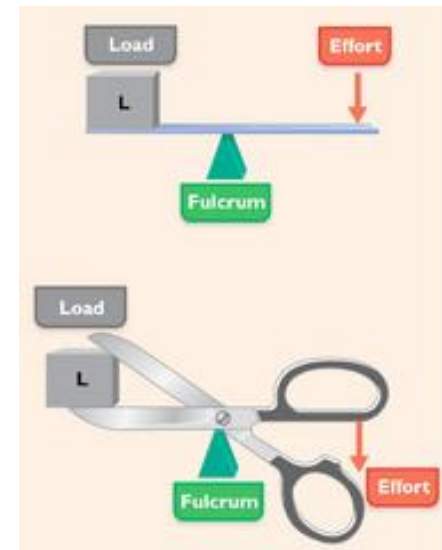


Heating, cooling & work done

6. Levers

Levers are simple machines that allow us to multiply the force applied. A lever can be used to lift heavy objects.

The input force (effort) is much less than the output force.



A wheel is another example of a simple machine. It does not change the size of the force but it does reduce friction.

