

Energy

Know the facts		Key words	
1	Work is done and energy is transferred when a force moves an object.	1	Work: The transfer of energy when a force moves an object, measured in Joules.
2	The bigger the force or distance, the greater the work done.	2	Lever: A type of machine which is a rigid bar that pivots about a point.
3	Machines make work easier by reducing the force needed by using levers (increasing the distance) and pulleys (reducing friction).	3	Input force: The force you apply to a machine.
4	There is energy in chemical stores associated with fuels.	4	Output force: The force that is applied to the object moved by the machine.
5	Temperature is measured using a thermometer. The temperature depends on the amount of energy stored in that objects.	5	Displacement: The distance an object moves from its original position.
6	To calculate the work done by an object moving horizontally, use: Work done (J) = Force (N) x distance moved (m)	6	Deformation: When an elastic object is stretched or squashed, this requires work.
7	When energy is transferred, the total energy is conserved, but some energy is dissipated, reducing the useful energy.	7	Infra-red radiation: Radiation given off by the Sun and other objects that brings about energy transfer.
8	The energy of an object depends on its speed, temperature, height or whether it is stretched or compressed.	8	Thermal energy store: Filled when an object is warmed up.
9	Energy cannot be lost or gained; it can only be transferred from one form to another.	9	Chemical energy store: Emptied during chemical reactions when energy is transferred to surroundings.
10	To calculate the percentage of energy that is wasted you would use the equation: wasted energy (J) / total energy input (J) x 100	10	Gravitational potential energy store: Filled when an object is raised.
11	The greater the temperature, the greater the thermal energy store.	11	Elastic energy store: Filled when a material is stretched or compressed.
12	Energy cannot be created or destroyed; it can only be transferred between stores.	12	Dissipated: Become spread out wastefully.
13	To calculate power, use the equation: Power = energy / time P = E/t	13	Conduction: The way in which energy is transferred through solids.
14	Electrical power is also calculated using: Power (W) = potential difference(v) x current (A) P = V x I	14	Convection: The transfer of energy by the movement of particles of gases and liquids.

There are different forms of energy stores, including:

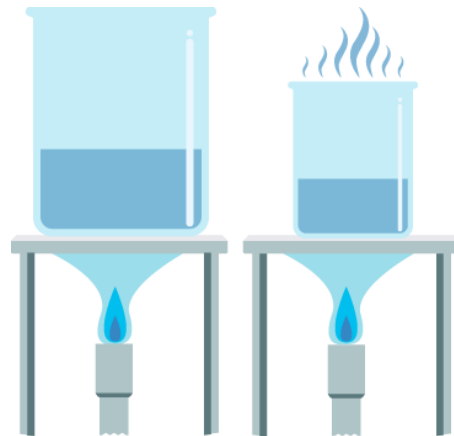
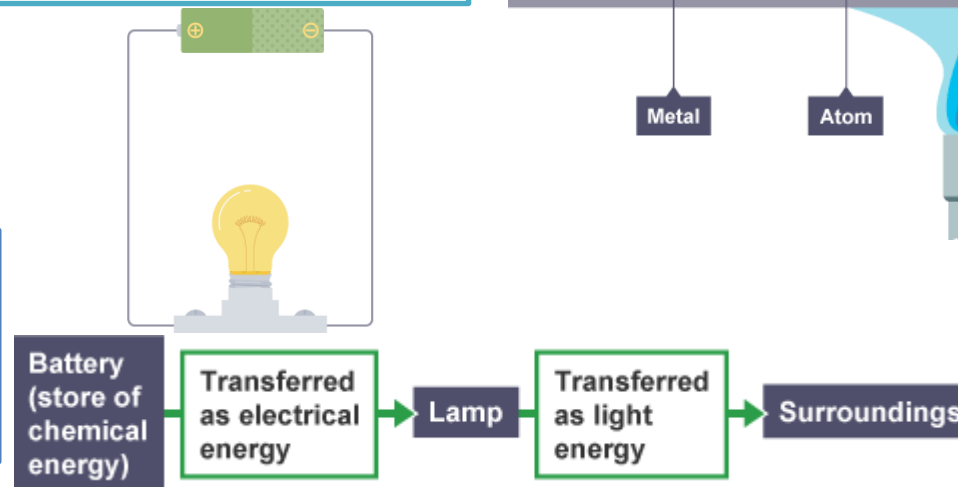
- kinetic energy
- internal energy
- elastic potential energy
- gravitational potential energy
- electrical energy

Energy stored in food can be released by combustion (burning) or by respiration in our cells. The labels on packets of food show how much energy is available from the food.



A food label on a packet of naan bread. 215 calories is the same as 900 kJ.

Energy transfer diagrams may be used to show the locations of energy stores and energy transfers.



To boil water we must increase its temperature to 100°C. It takes longer to boil a large beaker of water than a small beaker. This is because the large beaker contains more water and needs to gain more internal energy to reach 100°C.

Conduction

When a substance is heated, its particles gain internal energy and move more vigorously. The particles bump into nearby particles and make them vibrate more.

