ATHERTON HIGH SCHOOL

Science: Energy Part 1

1. Energy Stores

Chemical energy	Energy stored in the bonds in molecules and compounds
Elastic potential energy	Energy stored in an object that is stretched or compressed
Magnetic	Energy stored in the magnetic field around a magnet
Electrostatic	Energy stored I the electrostatic attraction and repulsion between ions
Nuclear	Energy released as waves such as light and gamma
Thermal energy	Energy stored or transferred as heat
Kinetic energy	Energy stored in an object that is moving
Gravitational potential energy	Energy stored in an object that is raised above the ground

2. Calculating energy

Gravitational potential	GPE = mass x gravitational field strength x height (J) (kg) (N/kg) (m)
Kinetic	KE = ½ x mass x velocity^2 *(velocity = speed) (J) (kg) (m/s)
Work done	Work done = force x distance (J) (N) (m)
Power	Power = Energy ÷ time OR Power = work done ÷ time (W) (J) (s) (W) (J) (s)
Efficiency	Efficiency = useful output energy ÷ total input energy

3. Conservation of energy and Energy transfers

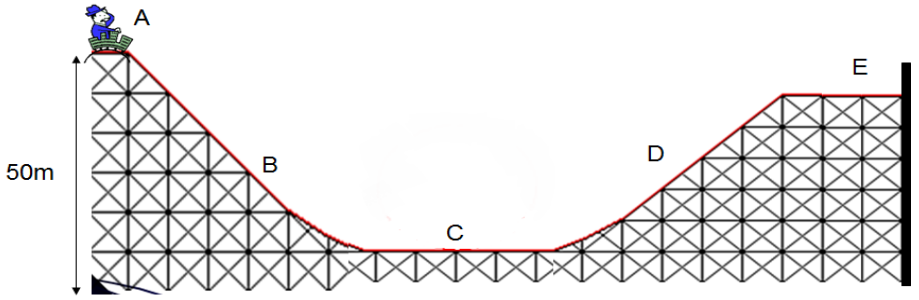
The Law of Conservation of Energy states that energy can neither be created nor destroyed only transferred between stores.

Energy transfers in a ball falling

Gravitational potential energy → Kinetic energy (useful)

Gravitational potential energy → Thermal energy (wasted)

A	Has the most GPE
B	GPE is transferred to kinetic energy and thermal energy is dissipated to the environment. The carriage speeds up.
D	Kinetic energy is transferred to GPE and thermal energy is dissipated to the environment. The carriage slows down.
E	There is no kinetic energy as the carriage has stopped.



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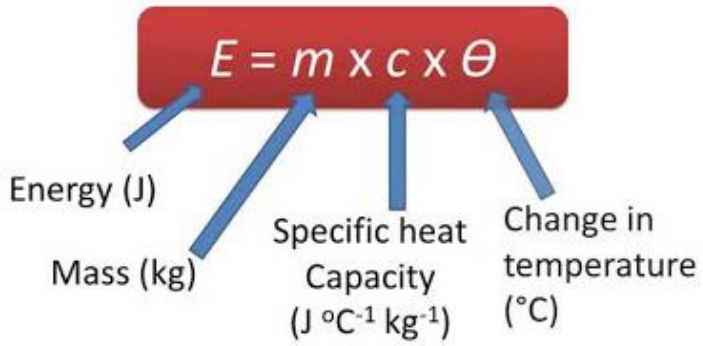
4. Specific Heat Capacity

The specific heat capacity is the amount of energy needed to increase the temperature of a 1kg mass by 1˚C



5. Units

Force	Newtons (N)
Power	Watts (W) OR kilowatts (kW)
Mass	Kilograms (kg)
Height	Metres (m)
Energy	Joules (J) OR kilojoules (kJ)
time	Seconds (s)