

PHYSICS FOUNDATION – YEAR 10 – ENERGY

A ENERGY		
1	Stores	Thermal (heat) Kinetic (moving) Electrostatic Gravitational potential (GPE) Elastic potential Chemical (e.g. food, fuel), Magnetic Nuclear
2	Transfers	Waves, electric current, heating, Mechanically (with a force).
3	Conservation of energy	Energy is transferred usefully, stored or dissipated, never created or destroyed.
4	Joules (J)	The unit of energy; 1kJ = 1000J
5	Dissipated	When energy is transferred in a way that is not useful, e.g. to the thermal energy store of the surrounding air particles.

B ENERGY TRANSFERS		
1	Falling objects	GPE store decreases, kinetic energy increases.
2	Objects Colliding	Kinetic energy decreases and internal energy store of the surroundings increases.
3	Energy transfer in bungee jumping	When the cord tightens, kinetic energy decreases and the elastic potential energy of the rope increases.

C RENEWABLE RESOURCES		
1	Renewable	Will not run out.
2	Biofuel	Carbon neutral. Reliable. Use anywhere. Stores chemical energy. Dilute energy source.
3	Wind, wave and solar.	No greenhouse gases. Unreliable. Free energy sources.
4	Geothermal, hydroelectric and tidal.	No greenhouse gases. Reliable. Limited locations. Free energy sources.

D NON-RENEWABLE RESOURCES		
1	Non-renewable	Will run out.
2	Coal, oil and natural gas	Store chemical energy. Produce greenhouse gases. Reliable.
3	Nuclear	No greenhouse gases. Produce nuclear waste. Release lots of energy. Reliable.

E ENERGY EQUATIONS		
1	KE	$= 0.5 \times \text{mass} \times \{\text{velocity}\}^2$
2	GPE	$= \text{mass} \times \text{gravitational field strength} \times \text{height}$
3	EPE	$= 0.5 \times \text{spring constant} \times \{\text{extension}\}^2$
4	Spring constant	The stiffness of a spring or elastic object.
5	Energy transferred	$= \text{work done}$ $= \text{force} \times \text{distance}$
6	Efficiency (no unit)	$\frac{\text{Useful output}}{\text{Total input}}$