KNOWLEDGE ORGANISER
BIG IDEA: ENERGY AND WAVES
TOPIC: ENERGY TRANSFERS

Energy Stores

Store	Definition
chemical energy store	Emptied during chemical reactions when energy is transferred to surroundings, for example when you burn a fuel.
elastic potential energy store	Filled when a material is stretched or compressed, for example when you stretch a spring.
gravitational potential energy store	Filled when an object is raised, for example when climbing a ladder.
kinetic energy store	Filled when an object speeds up, for example when a car accelerates.
thermal energy store	Filled when an object is warmed up, such as when you heat water in a kettle.

Key Terms

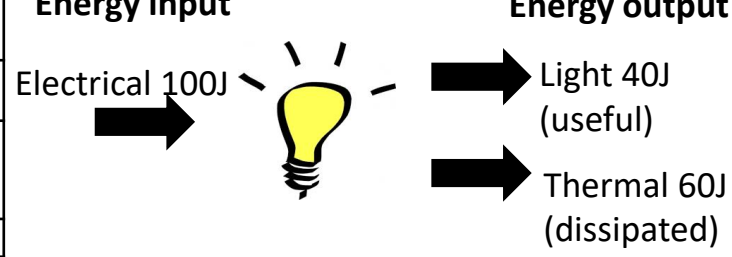
Term	Definition
dissipation	Becoming spread out wastefully.
law of conservation of energy	Energy cannot be created or destroyed, only transferred between stores.
system	An object or group of objects that interact.
energy transfers	Ways of transferring energy from one store to another are: light, sound, electricity, thermal, kinetic

Equations

Key Word	Definition	Equation
kinetic energy	The amount of energy stored in a moving object	Kinetic energy = o.5 x mass x velocity x velocity $E_k = 0.5 \times m \times v^2$
gravitational potential energy	The amount of energy stored in an object that has been raised off the ground.	Gravitational potential energy = mass x gravitational field strength x height $E_g = m \times g \times h$
elastic potential energy	The amount of energy stored in an object that has been stretched or compressed.	Elastic potential energy = 0.5 x spring constant x extension x extension $E_e = 0.5 \times k \times e^2$
work done	Doing work transfers energy from one form to another	Work done = force x distance in the direction of the force $W = F \times d$
efficiency	The amount of energy transferred usefully compared to the total energy inputted.	Efficiency = $\frac{\text{useful energy output}}{\text{total energy input}}$ **Efficiency (%) = $\frac{\text{useful energy output}}{\text{total energy input}}$ x 100**

Units

Term	Unit
energy and work done	Joules (J)
velocity	Metres per second (m/s)
spring constant	Newton per metre (N/m)
extension	Metres (m)
force	Newton (N)
mass	Kilogram (Kg)
gravitational field strength	Newton per kilogram (N/Kg)
height	Metres (m)



Efficiency (%) = $\frac{\text{useful energy output}}{\text{total energy input}}$ x 100

Efficiency (%) = $\frac{40J}{100J}$ x 100 = 0.4 x 100 = 40%