

**KNOWLEDGE ORGANISER****BIG IDEA: ENERGY AND WAVES****TOPIC: ENERGY TRANSFERS****Energy Stores**

Store	Definition
<b>Chemical energy store</b>	Emptied during chemical reactions when energy is transferred to surroundings, for example when you burn a fuel.
<b>Elastic potential energy store</b>	Filled when a material is stretched or compressed, for example when you stretch a spring.
<b>Gravitational potential energy store</b>	Filled when an object is raised, for example when climbing a ladder.
<b>Kinetic energy store</b>	Filled when an object speeds up, for example when a car accelerates.
<b>Thermal energy store</b>	Filled when an object is warmed up, such as when you heat water in a kettle.

**Key Terms**

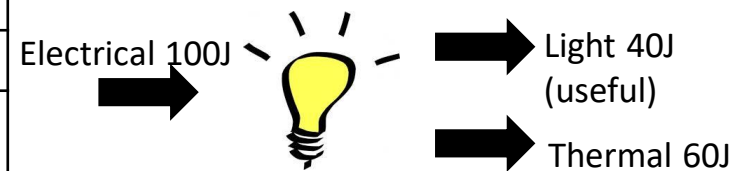
Term	Definition
<b>Dissipate</b>	Becoming spread out wastefully.
<b>law of conservation of energy</b>	Energy cannot be created or destroyed, only transferred between stores.
<b>System</b>	An object or group of objects that interact.
<b>Energy transfers</b>	Ways of transferring energy from one store to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

**Equations**

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

**Units**

Term	Unit
<b>Energy and Work done</b>	Joules (J)
<b>Velocity</b>	Metres per second (m/s)
<b>Spring constant</b>	Newton per metre (N/m)
<b>Extension</b>	Metres (m)
<b>Force</b>	Newton (N)
<b>Mass</b>	Kilogram (Kg)
<b>Gravitational field strength</b>	Newton per kilogram (N/Kg)
<b>Height</b>	Metres (m)

**Energy input****Energy output**

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

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