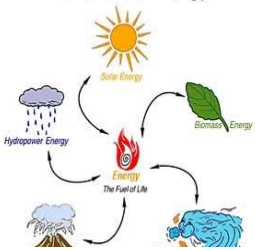
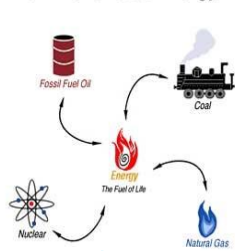


Renewable Energy



Non-Renewable Energy



START

Energy is not lost or gained, it is conserved and changed from one format to another

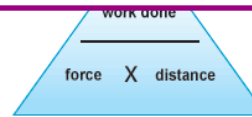
Types of energy:

1. Kinetic (movement)
2. Thermal (heat)
3. Light
4. Gravitational
5. Chemical
6. Sound
7. Elastic
8. Electrical
9. Nuclear

Y9 Physics 6.2

Work
Work done = force (N) x distance (m)

$W = f \times d$
The longer the distance the greater the work
The greater the force the greater the work

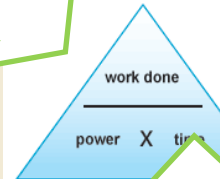


Power

Power (watts) = Energy (J) / time (s)

$$P = E / t$$

Power is defined as the rate at which energy is transferred or the rate at which work is done.



Electrical energy
100 J

Light energy
75 J

Heat energy
25 J

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

Key words:

1. **Energy:** Can be stored or transferred into different types
2. **Work done:** Product of the force and the distance over which the force is applied
3. **Power:** Measure in watts is how much energy is used per second
4. **Conservation of energy:** Energy is not lost or gained it is changed from one type to another
5. **Insulation:** Using a material to prevent heat loss
6. **Efficiency:** How much useful energy there is compare to total energy inputted
7. **Non-renewable energy:** Energy that cannot be made again for millions of year
8. **Renewable energy:** Energy that can be made again
9. **Fossil Fuels:** Coal, oil and gas, a non-renewable source of energy

Power

Power (watts) = work / time (s)
 $P = W / t$

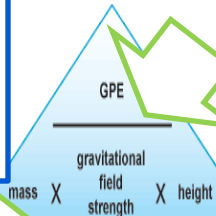
Kinetic energy

The energy of a moving object can be calculated using the equation below:
kinetic energy (joules) \approx $0.5 \times \text{mass (g)} \times \text{speed}^2_{\text{m/s}}$

Elastic potential energy

The amount of elastic potential stored in a stretched spring can be calculated using the equation below:

$$\text{elastic potential energy (joules)} = 0.5 \times \text{spring constant (N/m)} \times \text{extension}^2 \text{ (m)}$$



Gravitational potential energy

The amount of gravitational potential energy gained by an object raised above ground level can be calculated using the equation below:

$$\text{Gravitational potential energy (joules)} = \text{mass (g)} \times \text{gravitational field strength (N/kg)} \times \text{height (m)}.$$

How can we insulate our house

1. Double glazing
2. Loft insulation
3. Thick curtains
4. Cavity wall insulation
5. Draft proofing around doors and windows
6. Carpet

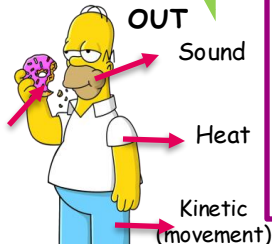
WHERE DOES THE HEAT GO?



IN

OUT

Chemical



Specific heat capacity

The amount of energy stored in or released from a system as its temperature changes can be calculated using the equation below:
change in thermal energy (Joules) = mass (kg) x specific heat capacity J/Kg °C x change in temperature (°C)

The specific heat capacity of a substance is the amount of energy needed to raise the temperature of one kilogram of the substance by one degree celsius.