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The Principle of Conservation of Energy

Energy can be changed from one form into another but *it cannot be created or destroyed*. Energy *is always conserved*.

As energy transforms from one form into another, some energy may be lost. For example in a light bulb the main energy change is electrical into light however some of the energy is lost in the form of heat.

Transformations

- Light bulb — electrical energy → light + (heat)
- Hoover — electrical energy → kinetic + (sound)
- Cooker — electrical energy → heat + (light)

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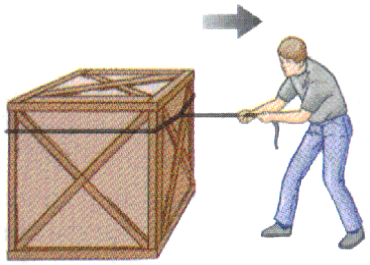
Work Done

When an object is moved from one place to another, energy has to be transformed to do this. We studied this concept in Unit 1.



To pull this box along the ground Joey transfers his chemical energy into work done.

The amount of energy transferred (work done) will depend on:

- The force applied to the box.
- The distance the box has been pulled from its original position (displacement)

Work done has the symbol E_w and is measured in joules, J

Force has the symbol F and is measured in Newtons, N.

Displacement has the symbol s and is measured in metres, m.

Work done = force x displacement $\qquad$ **$E_w = F \times s$**

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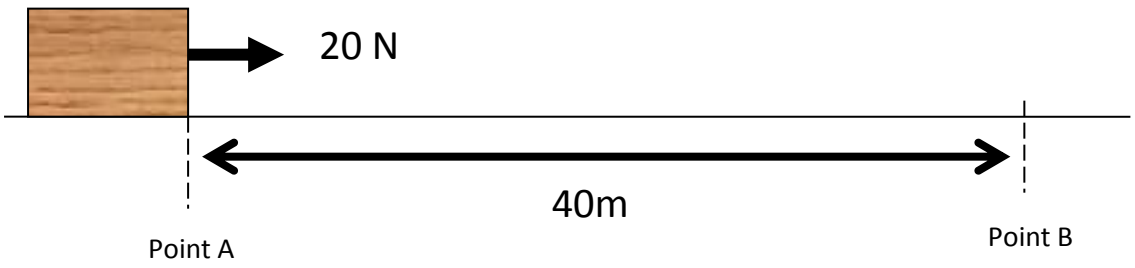
Carry out calculation using Ew = F x s

Example

Calculate the work done is pulling the 2 kg box from point A to B.



E_w = ?

F = 20 N

s = 40 m

Ew = F x s

Ew = 20 x 40

Ew = 800J