

Work and Elastic Potential Energy

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Work Done

Whenever we use or supply energy we say that **energy is transferred**

An old fashioned way, that physicists still use is 'work done'.

We say work done = energy transferred

Work done can be found by:

$$\begin{array}{l} \text{work done, } W \\ \text{(joules, J)} \end{array} = \begin{array}{l} \text{force applied, } F \\ \text{(newtons, N)} \end{array} \times \begin{array}{l} \text{distance moved along the line} \\ \text{of action of the force, } s \\ \text{(metres, m)} \end{array}$$

An important example of work done is when friction happens. Friction crops up all over the place. Common examples are brakes on a bike, rubbing your hands together shooting stars.

Very often friction causes kinetic energy to be transferred into thermal energy - so breaks get hot as you slow down a car and your hands can warm up if you rub them vigorously.



Elastic Potential

This is the energy that goes into something that is stretched - like a spring or some elastic.

$$\begin{array}{l} \text{elastic potential energy, } E_e \\ \text{(joules, J)} \end{array} = \frac{1}{2} \times \begin{array}{l} \text{spring constant, } k \\ \text{(newtons per metre, N/m)} \end{array} \times \begin{array}{l} \text{extension}^2, e^2 \\ \text{(metres, m)}^2 \end{array}$$