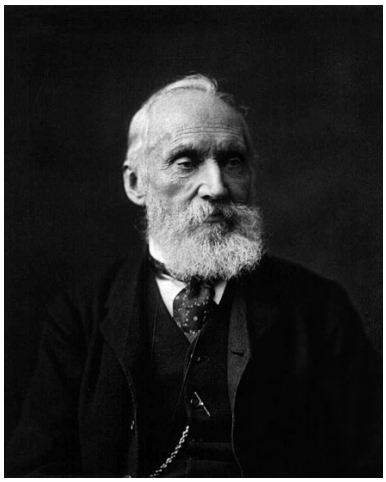
Lord Kelvin and kinetic energy



One of Scotland's most famous scientists, engineers and mathematicians was William Thomson, 1st Baron Kelvin. William had been born in Belfast and moved to Glasgow when his father was appointed as professor of mathematics at the university. At the age of 10, he began his own studies at the university.

He was prolific in his inventions and discoveries. Among other things, the Kelvin Scale of absolute temperature is named after Lord Kelvin. He contributed to the laws of thermodynamics.

He is credited as being the first scientist to coin the term 'kinetic energy'.

Kinetic energy: the energy an object or particle has by reason of its motion

$$\text{Kinetic Energy (Joules)} = \tfrac{1}{2} \times \text{Mass (kg)} \times \text{Velocity}^2 (m/s^2)$$

$$E^K = \tfrac{1}{2} MV^2$$

Question:

What is the kinetic energy of a car that travels at a speed of 20 m/s and has a mass of 1500 kg?

Example:

What is the kinetic energy of a car that travels at a speed of 20 m/s and has a mass of 1500 kg?

$$\text{Kinetic Energy} = \tfrac{1}{2} \times \text{Mass} \times \text{Velocity}^2$$

$$= 0.5 \times 1500 \times 20^2$$
$$= 300{,}000 \text{ J} = 300 \text{ kJ}$$

Practice questions

1. What is the kinetic energy of a runner with a mass of 62 kg running at a speed of 0.8 m/s?

2. What is the velocity of a bus travelling through town with a mass of 5040kg and kinetic energy of 493900J?

3. What is the velocity of a hot air balloon with a kinetic energy of 76550J and a mass of 1890kg?

4. Calculate the mass of a wind turbine blade with a kinetic energy of 104040J turning at 6m/s.

Energy stores

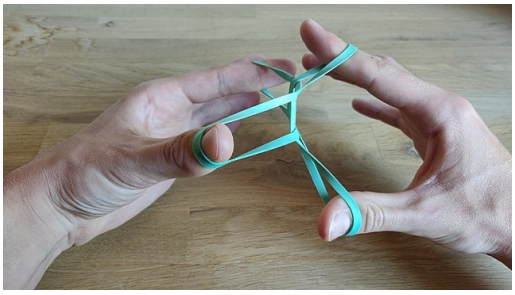
Read the statements in the table and match them with one of these energy stores

A. Kinetic

B. Gravitational

C. Thermal

D. Elastic



E. Chemical

Definitions of different energy stores	A - E
Energy stored in an object as a result of its height	
A force acting on an object that may cause the shape of the object to change	
The energy that an object or particle has because it moves	
This energy is stored in the bonds of atoms and molecules	
Energy that is contained in a system responsible for its temperature	