



videos

1.1 Energy stores and systems

Energy is stored in a number of ways:

- 1) When an object is lifted up – **gravitational potential energy**
- 2) In a moving object – **kinetic energy**
- 3) In chemicals – **chemical energy**
- 4) In the nucleus of atoms – **nuclear energy**
- 5) In the temperature of an object – **thermal energy**
- 6) When a material is stretched – **elastic energy**
- 7) When magnetic objects interact – **magnetic energy**

Some of the stores involve the interaction of different objects. In this case we talk about a 'system', which is a group of interacting objects. Consider lifting a stone upwards, away from the Earth's surface. In this case there are two objects interacting – the stone and the Earth. There is an increase in the gravitational potential energy store of Earth+stone system.

(1) Identify the store of energy (from the list above) in food.

(2) A petrol powered car is being driven up a hill. What energy store (from the list above) is losing energy?

(3) A petrol powered car is being driven up a hill. What energy store (from the list above) is gaining energy?

(4) An archer draws back the string on the bow. What energy store (from the list above) is losing energy?

(5) An archer draws back the string on the bow. What energy store (from the list above) is gaining energy?

(6) In a nuclear fission power station, the nuclei of a large atoms are split. This releases a lot of energy which can be used to heat water and turn it into steam. What energy store (from the list above) is losing energy?

(7)  In a nuclear fission power station, the nuclei of a large atoms are split. This releases a lot of energy which can be used to heat water and turn it into steam. What energy store (from the list above) is gaining energy?

Energy conservation

From the examples, above, we can see that energy can move from one store to another. An important physics law is that the total energy always remains the same. We call this 'conservation of energy'. Consider a ball being dropped from a height. The ball will start with a store of gravitational potential energy. As it falls, energy is transferred from its gravitational potential energy store to its kinetic energy store, as it speeds up.

(8)  Before it is dropped, a ball has 120J of energy in its gravitational potential energy store. How much energy does it have in its kinetic energy store just before it hits the ground?

(9)  In the previous question, explain why the answer you have given might not be correct!