

Energy Stores

Energy things to happen, it **does not make** things happen - just like money allows you to buy a packet of sweets, but it doesn't buy the sweets.

The energy of an object is stored in an _____ . Energy can be _____ from one energy store to another.

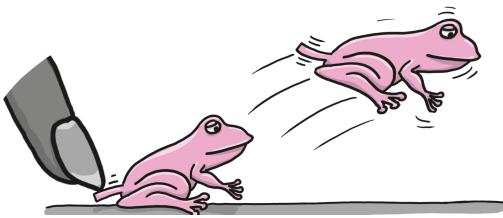
Energy has units of or J. Here are some energy stores:

Gravitational potential energy	Electrostatic energy
Elastic potential energy	Magnetic energy
Kinetic energy	Chemical energy
Nuclear energy	Thermal energy

- 2** Link each situation with the right energy store.

A nest in a tree	Gravitational potential energy
Two magnets close together	Magnetic energy
A charged battery	Chemical energy
A compressed spring	Elastic potential energy

- 3 Which energy store is the energy moved from and to which one(s) does it go to?
(a) A bird gliding down from the nest.



The **total energy** of a _____ is _____. Energy can not be _____ or _____. This is the **Law of conservation of energy**.

Total energy stored before = total energy stored after

- 4 A bank of batteries is used to power a hot plate to heat up cup of water. Every time the water's temperature increased by 1°C , the amount of energy left in the battery was measured. This was recorded in the table below.

Chemical energy left in batteries (J)	5000	4000	3000	2000	1000	0
Thermal energy of water (J)	1000	2000	3000	4000	5000	6000

- (a) How much chemical energy did the battery bank have at the start?

- (b) How much energy is needed to increase the water's temperature by $1\text{ }^{\circ}\text{C}$?
- (c) How much energy would you need to increase the water's temperature from $6\text{ }^{\circ}\text{C}$ to $10\text{ }^{\circ}\text{C}$, that is increase its thermal energy from 6000 J to 10000 J?
-
- 5 A ball rolls up a ramp and comes to a rest at the top. At the bottom of the ramp, it has a kinetic energy store of 1 J.
- (a) To what store has the energy transferred to?
- (b) How much is in the new energy store of the ball?
-
- 6 A toy train moves up a ramp. When it gets to the top of the ramp, it is still moving, and the chemical store is empty. The train's battery had 3 J at the start.
- (a) To what stores has the energy transferred to?
- (b) At the top of the ramp, the chemical energy store of the battery is empty. If 1 J of energy went to the potential energy store of the train, how much is in the other store?
-
- Energy can be _____ from the _____ to its surroundings. This energy is **dissipated**. It is stored in a _____ store.
- 7 The brakes stop the bicycle when the cyclist comes to a red light. Before putting on the breaks, they had 270 J.
- (a) How much energy is in the thermal energy store of the breaks once the bike has stopped?
- (b) Can this store usefully be used by the cyclist?
-
- 8 When a football is kicked, it changes shape and makes a noise, before moving away.
- (a) Which energy stores does the ball have when it is being kicked?
- (b) The foot has a kinetic energy of 100 J. One tenth of this is dissipated by sound waves and heat. How much of the useful kinetic energy store is left?