

P1. 2.1 Forms of Energy

Year 9

Week commencing 16th April 2012

Title: Forms of energy

Objective: Be able to list the main forms of energy and describe how energy forms can be changed.

I must be able to list the main forms of energy and apply these to real life situations

I should be able to identify where energy changes have taken place

I could describe in detail the energy transfer that takes place when an object falls to the ground

Starter

- Watch the movie clip about Fireworks Man - <http://videos.howstuffworks.com/science/fireworks-man-videos-playlist.htm#video-40994>
- While you are watching – write down the forms of energy that are involved.

Energy types involved in fireworks man

- Chemical (energy stored as fuel and released from chemical reactions)
- Kinetic (movement)
- Heat (thermal)
- Light
- Sound
- Gravitational Potential (potential energy of an object due to the force of gravity)

Now draw a mind map or list in your book about energy

You have 3 minutes to write down everything you can remember from previous learningGO!

Can you think of any other types of energy not involved with our firework example?

Other energy types not mentioned

- Electrical energy (energy electrons have as they flow around a circuit)
- Elastic energy
- Nuclear energy

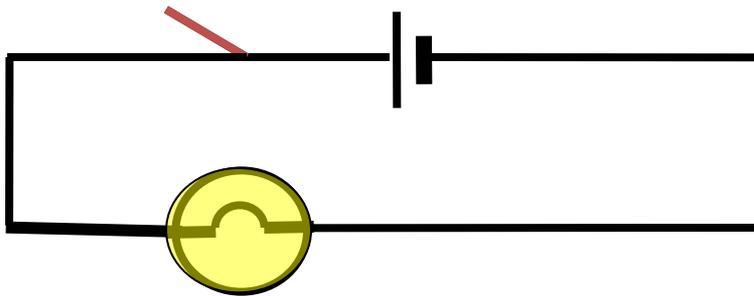
We will now look at some of the energy types in more detail

Make some notes about these and add them to your mind map or list

Electrical energy

This is the energy electrons have as they flow around a circuit.

Electricity is so useful because it is such a convenient way to transfer energy to a desired location or to a desired device.



What happens when the switch is closed?

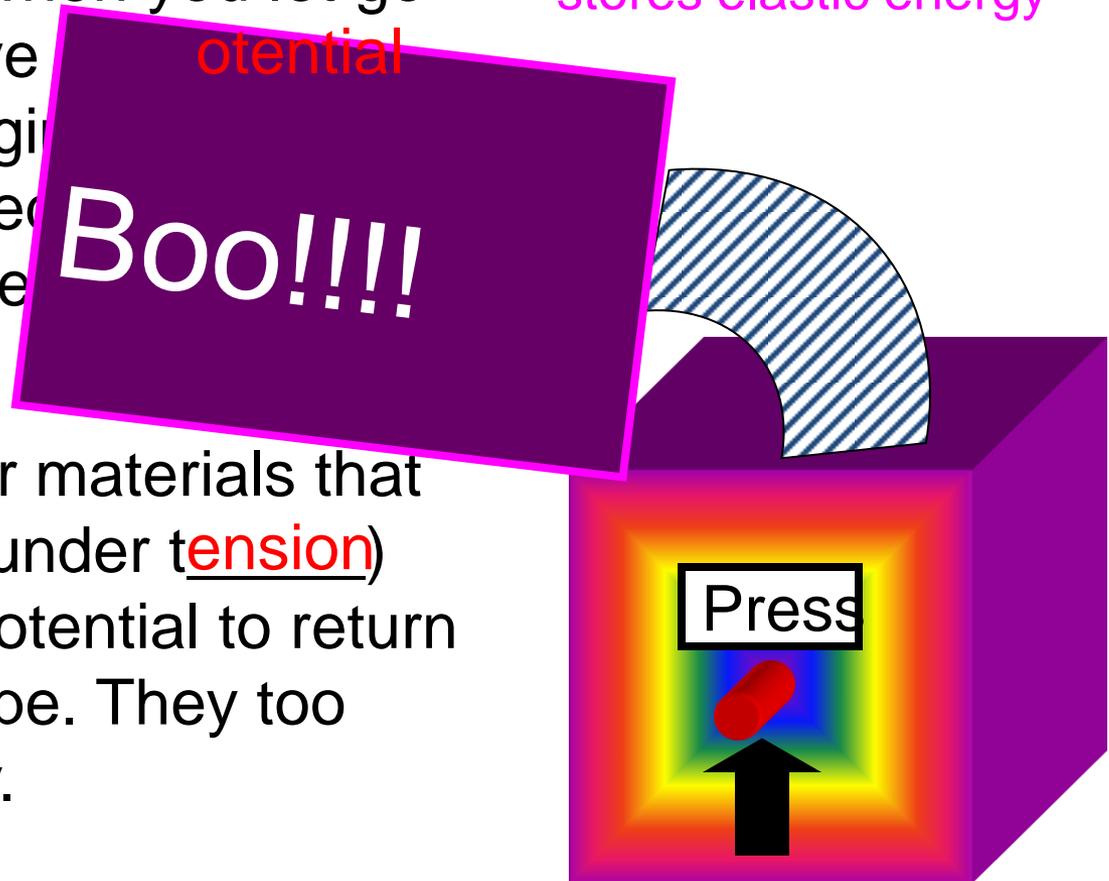
Electricity flows and the bulb lights.

Elastic energy

If you squash or compress an object or material, when you let go some materials have the potential to return to their original shape. We call the energy stored in a squashed or compressed material elastic energy.

The same is true for materials that are stretched (put under tension) they too have the potential to return to their original shape. They too store elastic energy.

A Jack-in-the-box stores elastic energy

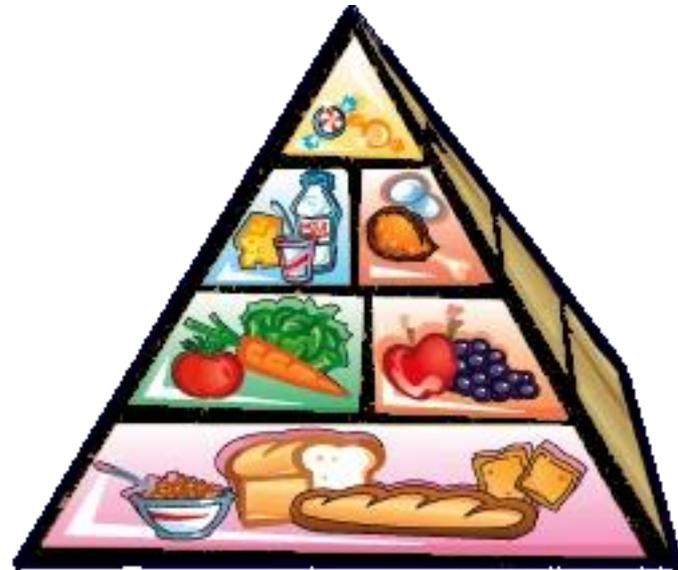


Chemical energy

When chemical bonds are broken they can release energy. The energy stored in these chemical bonds is referred to as chemical energy.

The three sources of chemical energy you need to know about are:

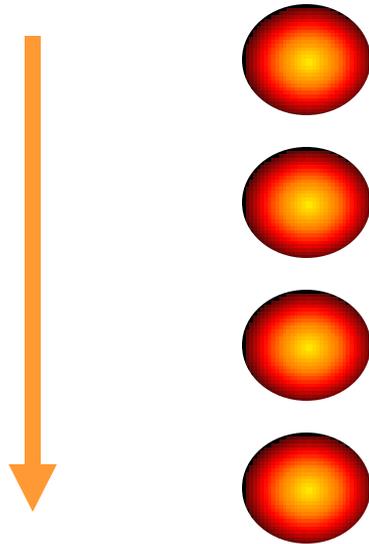
1. Batteries
2. Fuels
3. Food



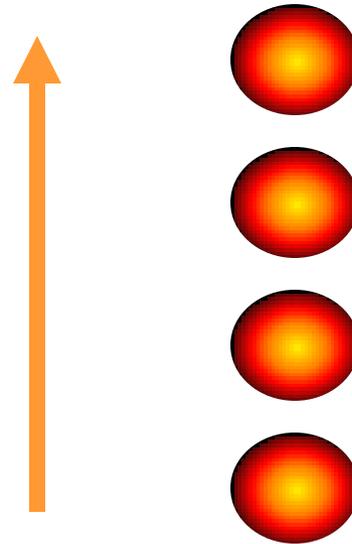
Changes in gravitational potential energy

For an object in Earth's gravitational field:

If an object falls will it gain or **lose** gravitational potential energy?



If an object moves up will it **gain** or lose gravitational potential energy?



The gravitational potential energy is transferred into kinetic energy or vice versa. In which situation is which?

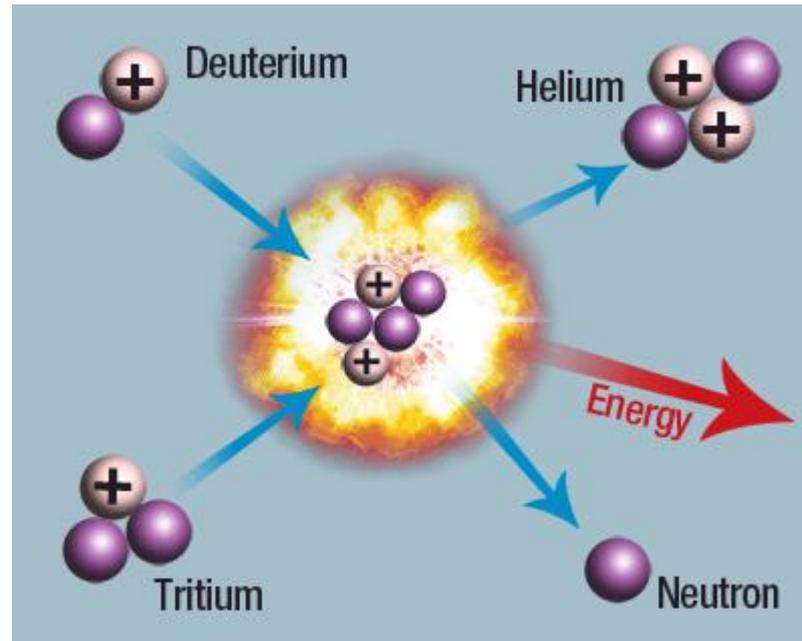
Some students tend to think of 'potential' as a form of energy all on its own and not just a way of describing stored energy, e.g. 'strain' and 'chemical' are both potential energy. This misconception should be corrected at this point.

Do a demo. Drop something large to ensure it makes a loud noise shows the energy transfer from gravitational potential to sound and thermal, use questioning to get the students to think about the type of energy involved and the energy transformations that are taking place. Introduce students to simple energy transfer diagrams and have them try to draw a couple of examples in their books, for the examples, you could clap your hands, or drop an apple or pencil case, turn on a light, try to make them relatively simple transformations for now as sankey diagrams will be introduced later.

Nuclear energy

This is the energy stored in the nuclei of atoms.

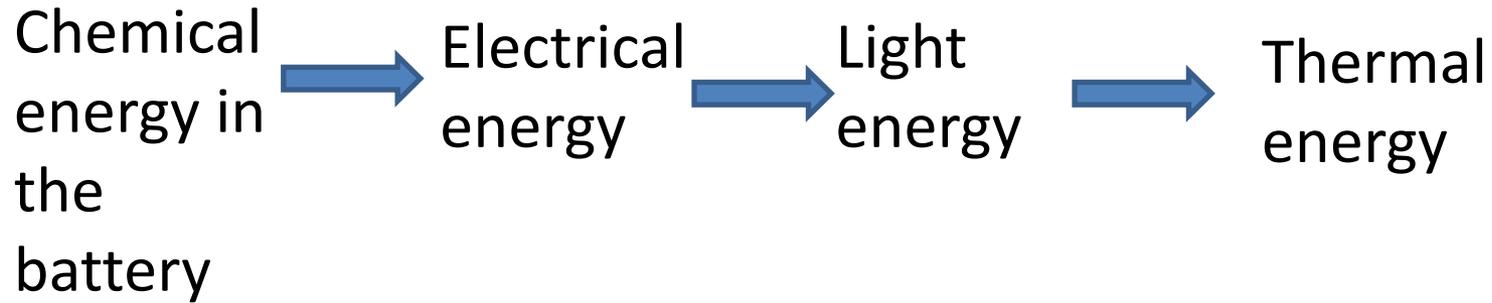
When nuclei are joined together or split apart, large amounts of energy are released.



- - It happens naturally in the sun and stars

Energy is often transferred from one form to another

For example in a torch:



Practical

- On the side there are a number of objects – walk around each one and note down which type of energy has transferred into which
- In you books make a table with 3 columns

Object	Starting energy type	Energy type transferred into

Plenary

- Pick 3 objects we use regularly in this room and note down the energy transfers that take place
- **MBA question.** What is the complete energy transfer sequence starting at the sun and ending with someone clapping their hands:

