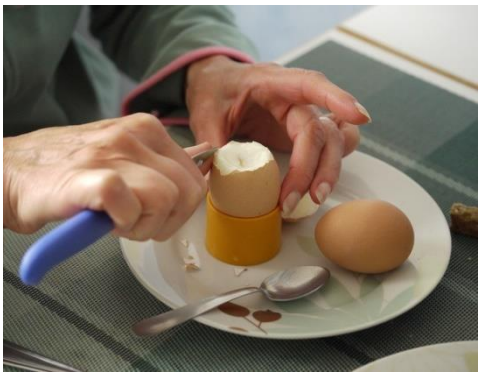
NST Grade 4 Term 3 Week 3

Stored energy

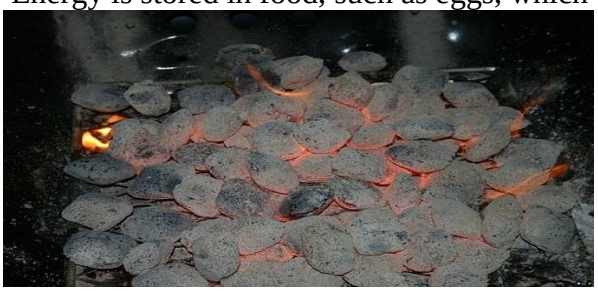
Energy is also stored in some sources. Stored energy is the energy that is stored in our food, in petrol, in wood, oil and other chemicals. Batteries also contain chemicals which are used to store energy. This stored energy can be used for different purposes.

Examples:

1. When we eat food, the stored energy in the food can be used by our bodies.
2. When we burn wood or coal, the stored energy is released as heat energy that we can use to keep us warm.
3. When we burn gas, we can use it to cook our food.
4. When we turn on a car, we use the energy in the petrol to give movement energy to the car.

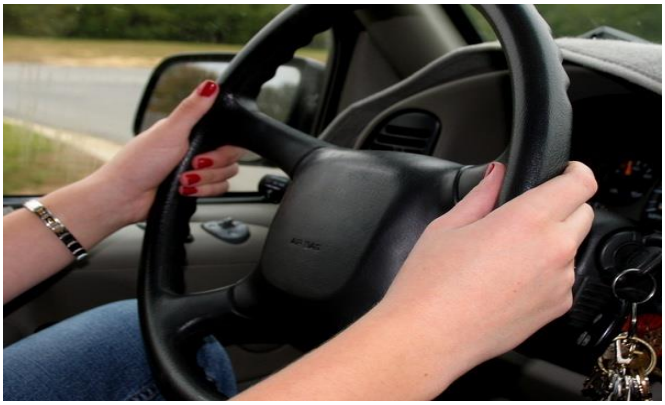


Energy is stored in food, such as eggs, which we eat for breakfast.



Burning coal releases the stored energy as heat and light.

Natural gas stores energy which is released as heat when it burns to cook our food.



When your parents or taxi driver turn on the ignition in their car, the energy stored in the petrol or diesel is released.

Transfer of energy

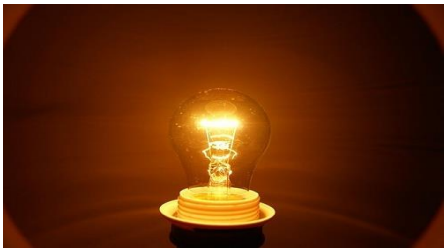
Energy can also be transferred (moved) from one part of a system to another part.

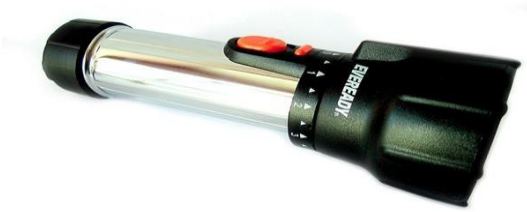
You must have heard of electricity before? We use electricity every day in our modern lives. Electrical energy can be transferred from a source to an appliance or light bulb.

A.1. Write down some things which you think need electricity in your life.

Fireflies produce light using chemical energy from their food! The light they give off is actually more efficient than that of a light bulb.

Look at this picture of the light bulb below. Electrical energy is transferred from a source to the light bulb to make it glow.





A light bulb gives off light energy and heat energy.
In a torch, energy is transferred from the batteries to the bulb.

Have you ever used a torch before? How do you think the bulb lights up in the torch? The batteries are the source of energy in the torch. When the torch is turned on, the energy is transferred from the batteries to the bulb to make it light up so you can see in the dark.

This brings us to the next section. We can think of the energy in the batteries of the torch as being the input energy and the light energy that is given off by the bulb as the output energy.

Input and output energy

- input energy
- output energy
- transferred

Whenever anything happens, energy is transferred from one component into another. People, machines and appliances need an energy input to work. They also have an energy output that may be useful.

Let's look at some examples.

Example 1:

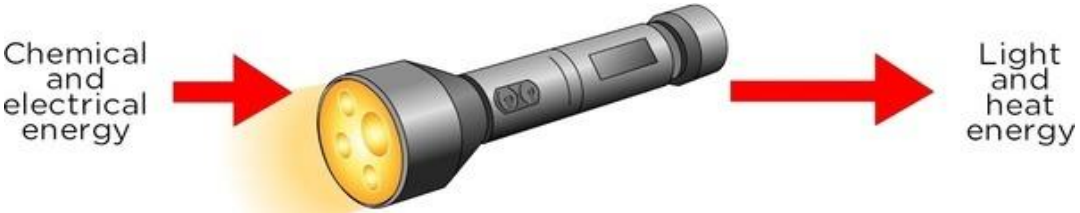
A girl is running a race. In order for the girl to have energy, she needs energy from somewhere. Her input energy is the chemical energy from the food that she ate. By running the race, she is giving out energy in the form of movement energy and heat.

Example 2:

A TV will only work if it is plugged in. It needs energy to work. While watching TV, electrical energy is the input and light and sound is the output.

Example 3:

A torch will not work when you turn it on unless it has batteries. The input energy for the torch to work comes from the chemical energy in the batteries which is changed to electrical energy. The output energy from the torch is light and heat energy.



Machines and appliances

We use lots of appliances in our lives. These machines and appliances need input energy to make them work. This is usually electrical energy. The output energy (the work the appliance or machine does) is something that is useful to us.

Let's look at some examples.

Investigating the input and output energy of appliances

After going through this activity to identify what the output energy is (and there are often more than one), go through the appliances in which there are output energies which are incidental and not the main purpose of the appliance. For example in a lamp, the main purpose is to get light energy, but heat energy is also given off. Heat energy is the incidental energy. This activity presents an ideal opportunity to start learning about some of these appliances. Once you have gone through all the appliances, it is easy to understand, what the essential output energy is that you want from the appliance and which are the incidental ones which also occur. For example, with a drill the main, essential output is movement, and the related, incidental output energies are sound and heat energy.

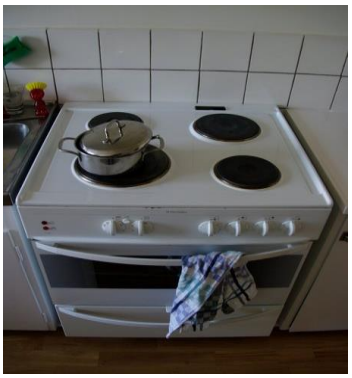
INSTRUCTIONS:

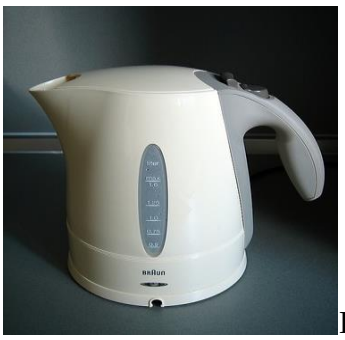
B.1.Below are pictures of different appliances.

B.2. Each one has input energy (electricity) and output energy which is transferred to the surroundings, such as heat, sound, light or movement.

B.3. Look at each image and write down the type of output energy that it transfers to the environment.

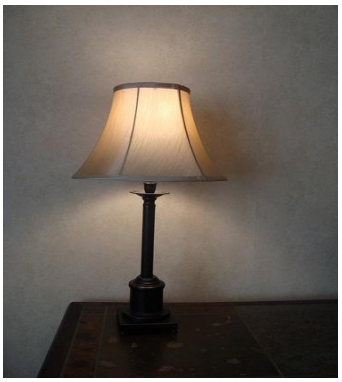
B.4. Some of the appliances may transfer more than one type of energy to the surroundings!

Appliance	**Output energy transferred to surroundings**
 Stove	B.3.1. _____



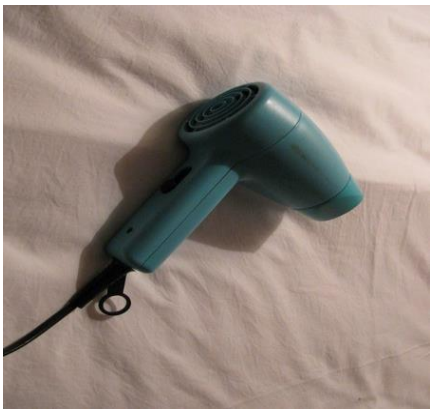
Kettle

B.3.2. _____



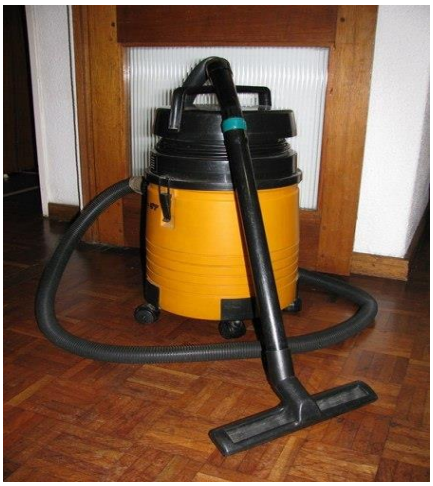
Lamp

B.3.3. _____



Hair dryer

B.3.4. _____

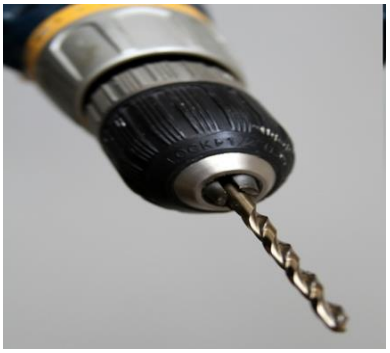


B.3.5. _____

Vacuum

B.3.6. _____

Electric fan



B.3.7. _____

Drill

In summary, we can say that in appliances and machines, the input is normally electrical energy and the output depends on the appliance:

- Heat energy - from a geyser, stove, kettle, hair dryer
- Sound energy - from a drill, vacuum cleaner, hair dryer
- Light energy - from a lamp, torch
- Movement - from an electric fan, drill

- Energy is all around us.
- Energy can be moving in the form of light, heat, sound and moving objects.
- Energy can be stored in food, wood, coal, oil and natural gas.

In the table, fill in examples of different sources of energy.

Light energy source	**Heat energy source**	**Sound energy source**	**Stored energy source**

There are many correct answers for this table.

C.1. Which sense organ do you use to detect sound?

C1. _____

A hearing-impaired person cannot hear music. How do you think someone who is hearing impaired could still dance to the music?

C.2. _____

C.3. Which sense organ do you use to detect light?

C.3. _____

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For each of the following appliances, decide what is the input energy and identify the output energy.

Appliance	**Input Energy**	**Output Energy**
Radio		
Hair dryer		
Car moving		
Riding a bicycle		
Playing drums		
Lights in your home		
Plants growing		

C.4. What does "energy is transferred" mean?

The word **transfer** means `to move from one person, place, or object, to another'. Therefore, `energy transfer' means that energy has moved from one object to another, for example, from a battery to a torch bulb.

C.5. List three substances that contain stored energy that we can use.