



Energy Education

Intermediate Phase (Grade 4) (CAPS)

Learner activity sheets and resources

Natural Science & Technology



Energy Education



Dear Learner,

The demand for electricity is growing. Building new power stations to increase the supply of electricity is costly, time consuming and is one of the solutions.

An immediate solution is to change the way in which we use electricity – that is using electricity wisely without wasting.

Eskom kindly asks you, the learner, to please put into practice different ways of using electricity wisely. You are going to learn a lot in energy education. Some of the things you will learn are:

- the changes in technology (use energy-saving lights instead of the traditional old lights),
- how to use technology more wisely (using the switch to switch off remote controlled appliances instead of the remote),
- other energy-wise saving tips,
- and how using energy wisely helps to care for our environment – our earth.

Do not worry, the energy education will be part of your school work. Be alert and become an example of how to use energy wisely. Share all that you learn with your friends, family and community. Remember to be energy-wise wherever you are – at home, at school and in other places.

Thank you for taking care of our earth.

Activity I: Properties of materials – Light bulbs

We use different raw materials to manufacture things we use in our lives. Below is some information on raw and manufactured materials and on the properties of materials.

Raw and manufactured materials

Here are examples of some raw materials we use to make other useful materials:

- sand is used to make glass
- clay is used to make ceramics
- coal and oil are used to make plastics, paints and fabrics
- wood and fibre from plants are used to make paper
- animal wool and hide are used to make fabrics and leather
- some metals are also used in the manufacture of products

Properties of materials

Raw and manufactured materials have specific properties. These properties can include being:

- hard or soft
- stiff or flexible
- strong or weak
- light or heavy
- waterproof or absorbent

Some materials are transparent i.e. you can see through them.

Activity I: Properties of materials – Light bulbs

Light bulbs are used in our daily life. Over the years we have become more aware of using electricity in a wise way. Traditional incandescent bulbs (old light bulbs) are being replaced with an energy saving light called the compact fluorescent light (energy saving).



- I. Study the pictures of the lights and use all the information provided to answer the questions.

A



B



Traditional incandescent bulb	The compact fluorescent light (energy saving)
<ul style="list-style-type: none">• Has a thin stiff tungsten wire inside which conducts electricity• The wire has to heat up to 2000°C before heat energy is converted to light energy• Wastes energy	<ul style="list-style-type: none">• Has mercury vapour (gas)• Does not heat up as much• Saves energy

Activity I: Properties of materials – Light bulbs

I.1 Which is the energy saving light (A or B)? Give a reason for your answer.

I.2 Which is the old light (A or B)? Give a reason for your answer.

I.3 Complete the table for the materials used in the manufacture of the traditional incandescent bulbs.

Materials used	Specific properties (see under properties of materials)
I.	I.

Activity I: Properties of materials – Light bulbs

1.4 Complete the table for the materials used in the manufacture of compact fluorescent lights (energy saving).

Materials used	Specific properties (see under properties of materials)
1.	1.

1.5 List the common materials used in the manufacture of both traditional incandescent bulbs and the compact fluorescent lights (energy saving). Next to each material write down the raw material from which it was made.

Common materials used	Raw material from which it is made
1.	1.

Activity I: Properties of materials – Light bulbs

1.6 Why do you think plastic was not used to replace the wire inside the traditional bulb?

1.7 Which light must we use at home to save electricity?

Activity 2: Energy around us – Energy transfer and input and output energy

- We are aware that energy is around us, including movement, heat, light and sound.
- Energy is also stored in sources such as food, wood, coal, oil products and natural gas.
- Energy can be transferred from a source to where it is needed.

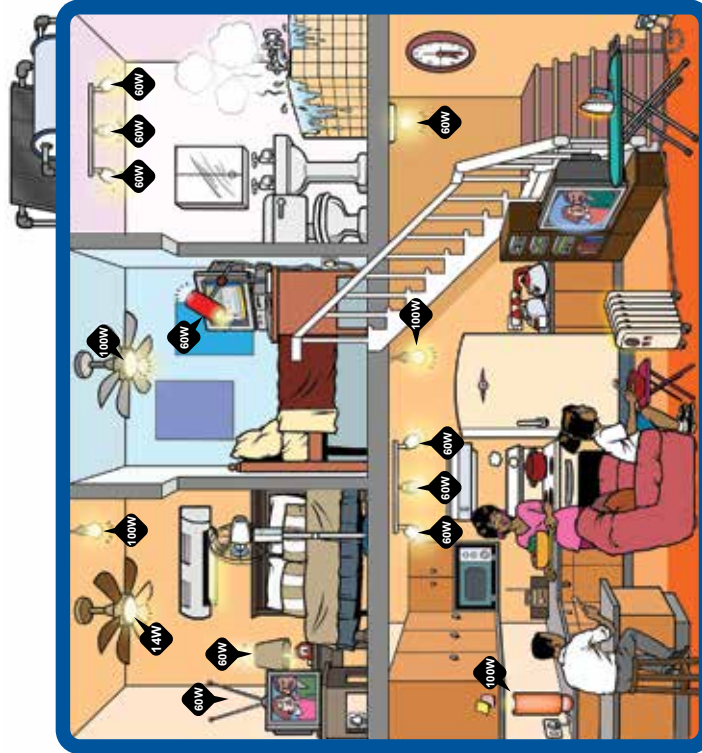
Input and output energy

- Machines and appliances need an input of energy to make them work.
- Machines and appliances provide an output of energy (work) useful to us.

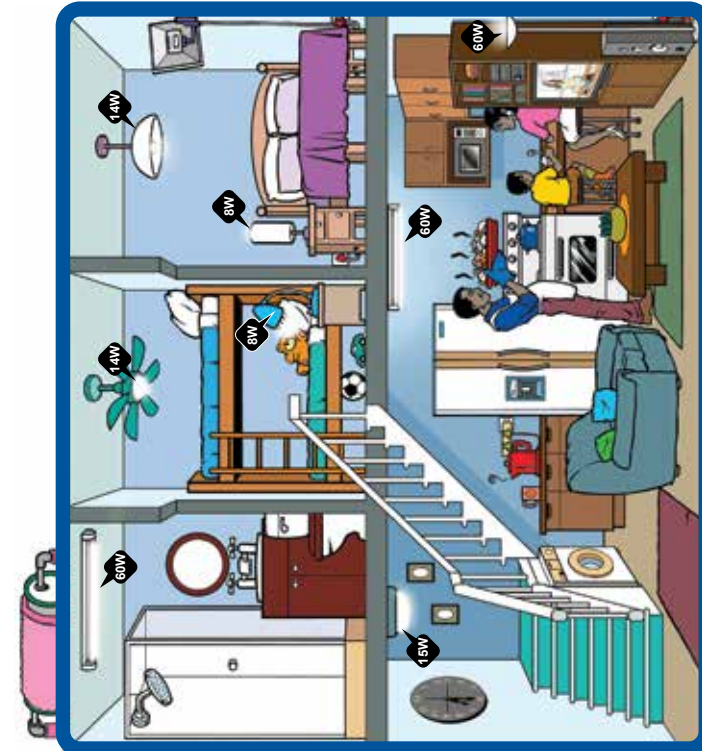
Activity 2: Energy around us – Energy transfer and input and output energy

Study the picture of the two families (the Watt Family and the Kilowatt family) and answer the questions.

Kilowatt family



Watt family



Activity 2: Energy around us – Energy transfer and input and output energy



1.1 What is the main source of energy used by the Watt family?

1.2 What sources of energy is the Kilowatt family using? Give a reason for your answer?

2. Give examples of appliances from the pictures for the following energy transfer.

		Appliances
1.	Heat	
2.	Sound	
3.	Light	
4.	Movement	

3. Select one of the appliances from downstairs and draw a flow diagram to show the input energy and the output energy.

Activity 2: Energy around us – Energy transfer and input and output energy

4. Find the following appliances used by the Watt family.

- Remote television/s
- Stove
- Geyser
- Refrigerator (fridge)

4.1 Which appliance do you think uses the most amount of energy in a house? Explain why you have chosen that appliance.

4.2 While there is some energy loss (wasted energy) like in the heating of the fridge motor, list some of the ways in which the Kilowatt family is wasting energy.

5. Based on what you have learnt about energy transfer, what advice would you give the Watt and Kilowatt families for them to save energy.

6. Using what you have learnt about energy write down an energy saving behaviour you will put into practice at home or school from today. Write down the behaviour on a piece of paper/cardboard and keep it in a place where it will serve as a reminder to you every day.

For example:

I will switch off lights that I am not using.
