



# **Energy Education**

Intermediate Phase (Grade 6) (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.

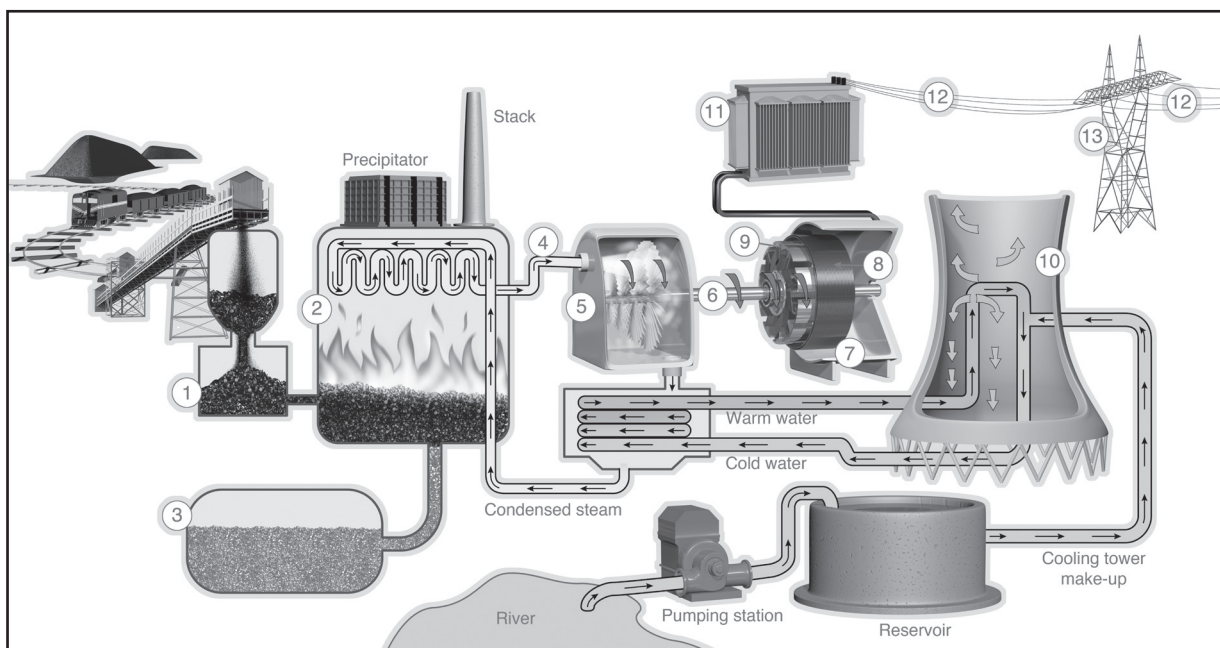
**Thank you for taking care of our earth.**

## Activity I: Energy – Mains electricity – The coal fired power station

### Fossil fuels and electricity

- Fossil fuels were formed in the Earth's crust millions of years ago from dead plants and animals.
- Coal, oil and natural gas are fossil fuels.
- In South Africa coal is the most used fuel in power stations.
- Coal was formed from fossilised plants which got their energy from the sun originally.
- In a coal fired power station coal is used as the fuel in the process of generating ("making") electricity.
- Fossil fuels are non-renewable resources.

- I. Study the diagram on how electricity is generated (made) using coal and answer the questions.

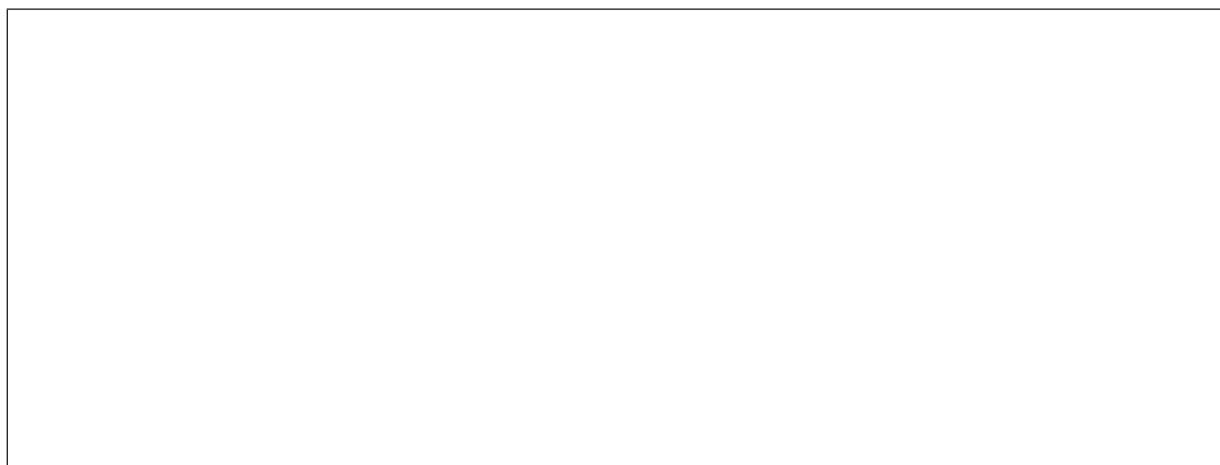


## Activity 1: Energy – Mains electricity – The coal fired power station

1.1 Provide labels for numbers 1 to 13 on the diagram.

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	

1.2 Draw a flow diagram to trace right back where the electricity for lights in a home come from.



## **Activity I: Energy – Mains electricity – The coal fired power station**

2. Fossil fuels are non-renewable resources. Non-renewable resources are not limitless – these resources get used up. Fossil fuels can take millions of years to form.

2.1 Is coal a renewable or non-renewable resource? Give reasons for your answer.

---

---

---

2.2 Which resource is used as the main fuel in the process of generating (making) most of the electricity in South Africa?

---

2.3 Why is it a disadvantage to use coal as a resource in the process of generating (making) electricity?

---

---

---

2.4 Explain why it is necessary to use electricity wisely?

---

---

---

## **Activity 1: Energy – Mains electricity – The coal fired power station**

3. People are looking for ways to use renewable resources to generate electricity.
- 3.1 Write down which are the renewable sources of energy from the following list: wind/wood/water/coal/natural gas/oil/solar energy/nuclear energy/steam

- 3.2 Select which resource is better to use in South Africa: solar energy or wind. Explain why you chose that resource.

---

---

---

---

## Activity 2: Energy – Cost of and saving electricity

### Cost of electricity

- Electricity is costly because it requires infrastructure which include coal mines, transport, power stations, pylons, substations, cables and wiring and persons to construct and maintain the services.
  - Some electrical appliances require more electricity than others (heating appliances use the most electricity).
  - The more electricity we use the more we pay and the more coal is used up.
  - We can save energy in many ways.
1. The labels on appliances usually tell you the power rating of an appliance e.g. kettle – 2000W or television – 300W. Sometimes this information is given in advertisements.

Find advertisements showing the following appliances and write down the power ratings. If you have these appliances at home ask an adult to help you get their ratings. Please be careful when checking appliances. Make certain the switch is off.

Appliance	Power in Watts	Power in watts (appliance in an advertisement or in your home)
Television	300W	
Energy saving light (Compact Fluorescent Light - CFL)	11W	
Electric kettle	1850W	
Old light bulb (incandescent)	60W	
Iron	1400W	

## Activity 2: Energy – Cost of and saving electricity

- 1.1 From the information given in the table write down the amount of electricity the appliances use in order from lowest to highest. Let us assume that all the appliances are switched on at the same time for the same period (e.g. for 2 hours). The power ratings will indicate which uses the lowest and the highest electricity. Do the same for what you have found at home.

	Power in Watts (lowest to highest)	Appliance
1.		
2.		
3.		
4.		
5.		

- 1.2 Write down how one can use each appliance in a way that will save electricity. First discuss the energy saving tips with your friends.

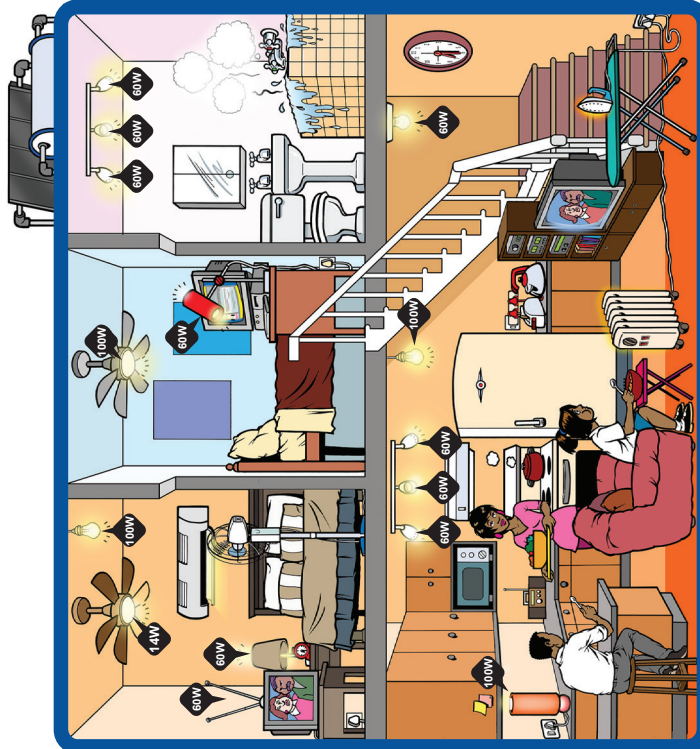
	Appliance	Energy saving ways to use the appliance
1.		
2.		
3.		
4.		
5.		



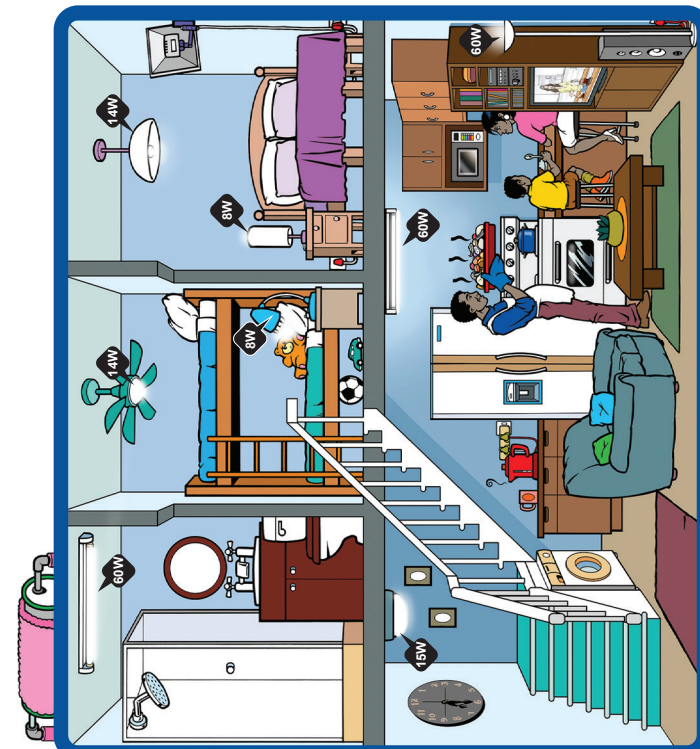
## Activity 2: Energy – Cost of and saving electricity

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

Kilowatt family



Watt family



## Activity 2: Energy – Cost of and saving electricity

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

---

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

---

---

---

2.3 Do you think the Watt and Kilowatt families are using electricity wisely? Are they wasting or saving energy? Give reasons for your answer.

---

---

---

---

2.4 Why should both families save electricity?

---

---

---

2.5 List ways in which these two families can save electricity.

---

---

---

---

2.6 Write down other ways in which one can save energy.

---

---

---

2.7 In order to use our coal resources wisely and save electricity, what do you think should be the golden rule for the use of electricity? [Complete the rule]. **Switch it off ...**

### Activity 3: Energy and electricity – Saving electricity

Study pictures A and B answer the questions.



A



B

2.1 List the differences between picture A and picture B.

Picture A	Picture B
1.	1.

2.2 What shows you that the old light bulb gives off a lot of heat?

### Activity 3: Energy and electricity – Saving electricity

2.3 The lady in picture B decided that she could make some money by selling electricity to people living in an old building in a piece of vacant land next to her house. She got a friend (who was not an electrician) to make the electrical connection to the building next door. The cables or wires that connected the two buildings were not properly covered. Children usually played in the vacant land.

2.3.1 Did the lady in picture B do the right or wrong thing?

---

---

---

2.3.2 What are your reasons for saying yes or no in 2.3.1?

---

---

---

---

2.3.3 What are the consequences of what the lady in picture B did?

---

---

---

---

2.3.4 Do you think it would be alright if she got a qualified electrician to make the connection? What is the reason for your answer?

---

---

---

---

### **Activity 3: Energy and electricity – Saving electricity**

2.4 List ways in which the lady in picture A is saving electricity.

---

---

---

---

---

---

---

2.5 How can the lady in picture B save electricity and bring her electricity account down?

---

---

---

---

---

---

---