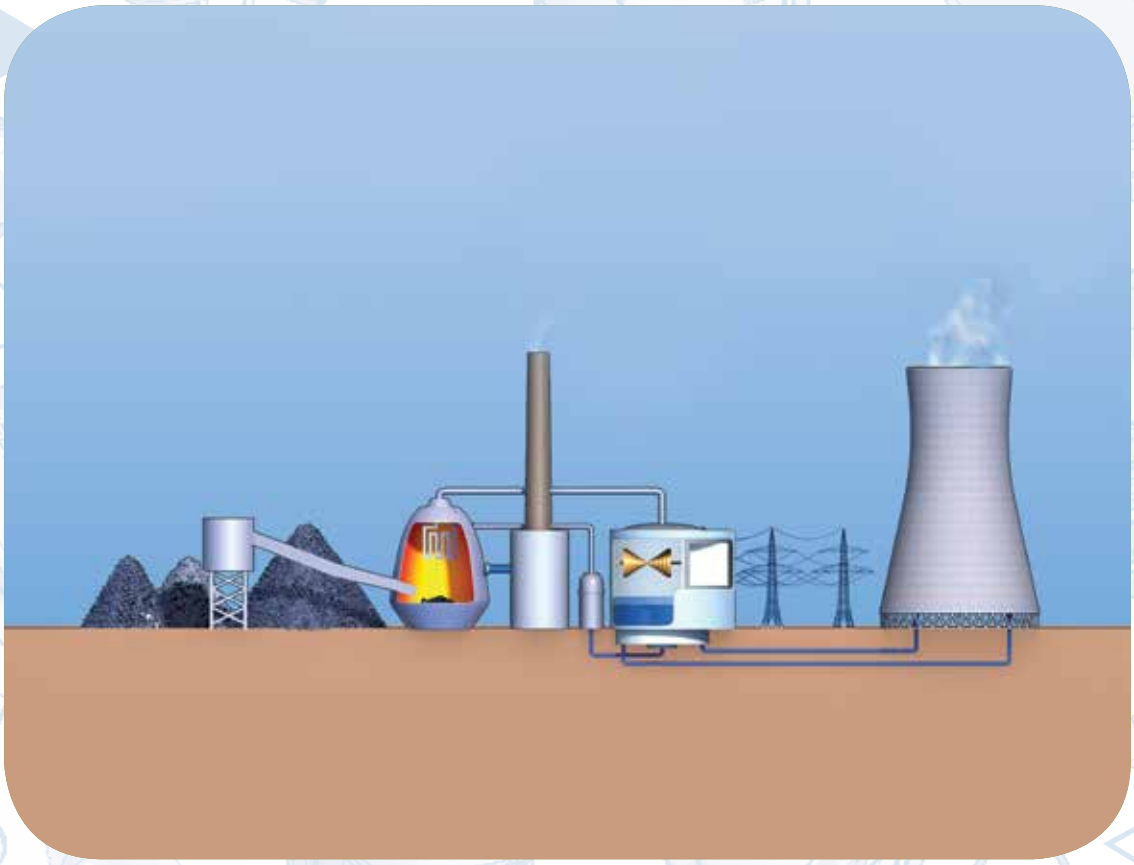
The value of our electricity

Intermediate Phase (Grade 6)

Learner activity sheet

English Home Language



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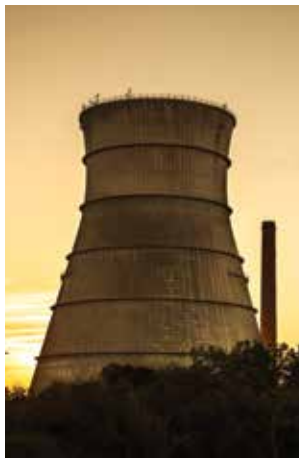


How to save energy

Dear Learner

Electricity is produced from fuel such as coal, water, diesel and uranium which are limited resources. Building new power stations to increase the supply of electricity is costly, time consuming and is only one of the possible solutions towards producing more electricity. Increased use of electricity means we use up our limited natural recources and means we pollute more.

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 1: Which lights should we use?

1. Study the two pictures showing how electricity is being used.

- Write down the differences between pictures A and B.
- Number your differences as 1, 2, 3…

Picture A

Picture B

Picture A	Picture B
1.	1.

2.1 How much is the electricity account in picture A?_____

2.2 How much is the electricity account in picture B? _____

2.3 Why do you think that the amounts on the electricity accounts are different?

3. Do you think it is right for the lady in Picture B to leave a light bulb on when it is already 08:00am and the sun could be providing light from outside?

Explain why you think so? _____

4.1 Look at the expressions on the ladies' faces in both pictures. Which lady shows how you are using energy at home?

4.2 Write a paragraph on energy-saving lights (compact fluorescent lights – CFLs). Use the information from the table in which you have written the differences between the pictures of the 2 ladies. *[Your paragraph should not be more than 100 words].*

5.1 What do you think is the main idea in picture A?_____

5.2 What do you think is the main idea in picture B?_____

5.3 Use a mind-map to summarise the information given in picture A.

5.4 Write a paragraph on energy-saving.

5.5 Your teacher is going to call you to the front of the class to present an unprepared speech on energy-saving. Be wise and talk about all that you have learnt about energy-saving.

6.1 Do you think that the information in the pictures is useful?

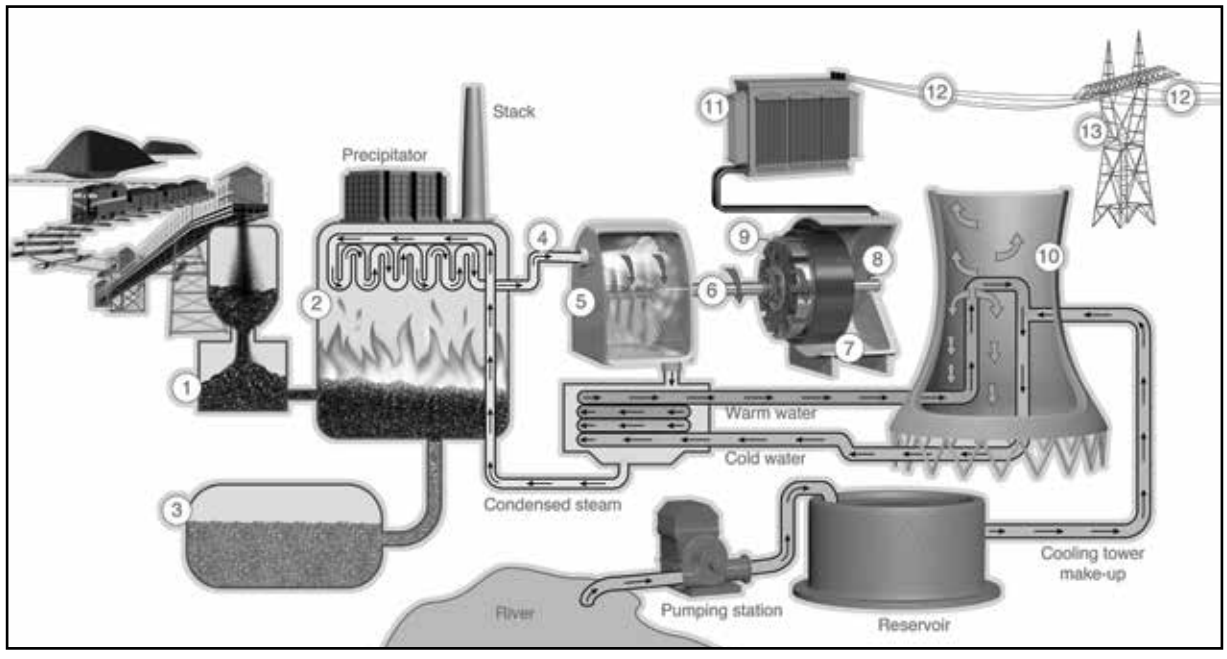
6.2 How can you use this information to change your daily life?

6.3 How can you use this information to inspire other people to change?

6.4 Design/write an A4 page leaflet on energy-saving lights – make the change!

Activity 2: Electricity generation in South Africa.

The diagram below shows how we get most of our electricity in South Africa. We use a natural resource namely coal to provide energy for the process through which we get our electricity. Other sources like hydro-electric power stations, nuclear power stations and wind turbines are also used to provide electricity to a lesser extent. The diagram below shows how we get most of our electricity in South Africa. We use a natural resource namely coal to provide energy for the process through which we get our electricity. Other sources like hydroelectric power stations, nuclear power stations, and wind turbines and solar panels are also used to provide electricity to a lesser extent.



1.1 Study the diagram. Discuss in your groups how we get most of our electricity in South Africa.

How electricity is generated

The generation of electricity is the conversion of other forms of energy into an electrical current.

Electricity from coal

In most modern power stations in South Africa, coal is burned to heat water and convert it into steam. The steam is directed onto the blades of a turbine to make it spin. This in turn spins the magnetic rotor inside the coil to generate electricity.

Once the steam has passed through the turbines, it must be cooled and condensed. The cooling process turns the steam back into water so that it can be pumped back to the boiler for reheating. In the boiler it will be turned into steam again and will restart the cycle.

Many coal-fired power stations are built right next to coal mines. The coal is transported from the mine to the power station on overland conveyor belts or by using trucks. This saves time and money and helps keep the cost of electricity down.

Electricity can also be generated from water, gas and atoms (nuclear energy)

1.2 The following words are associated with the generation of electricity. The terms teach you about sources of energy and how electricity is generated:

1. Given by nature
2. Tall structure for support
3. Things around us
4. To continue or can be made again or can be replaced (no limit)
5. Cannot be made again or cannot be replaced (limited)
6. To make dirty
7. Things we need to live
8. Motor or engine that turns e.g. by using the flow of water or gas9.
9. Machine that can produce or create a form of energy e.g. electricity by turning

1. Pylon _____

2. Renewable _____

3. Non-renewable _____

4. Pollution _____

5. Natural _____

6. Resource _____

7. Environment _____

8. Turbine _____

9. Generator _____

1.3 In your book write down the steps on how we get electricity. Use the diagram on page 6, the words from (1.2) and your group discussion to help you. Do this question on your own.

Effects of burning coal

Electricity is an energy source that needs to be produced. To make electricity you first need some form of fuel to create the energy that is converted to electricity. Most power stations in the world still use coal as their key source of fuel. Coal is also known as a fossil fuel.

The coal is burnt which heats up water which in turn creates steam. This steam is then used to drive a steam turbine which drives a generator that produces electricity. Coal can be transported relatively easily and so it allows us to generate electricity where it is needed. Coal is also readily available but the supply is not going to last forever.

One of the biggest worries for communities and governments is what burning coal does to our health and the health of our environment. Burning fossil fuels results in large amounts of carbon dioxide, which is a by-product of burning fossil fuels, being released into the air and the atmosphere.

It is calculated that the total release of CO2 (carbon dioxide) into the atmosphere from the world's electrical power industry is around 10 billion tons ever year. This means that the amount of carbon dioxide in the air is increasing rapidly. This has led to what is known as the greenhouse effect. Heat is trapped inside the atmosphere and increasing the temperature, making it hotter and hotter. This in turn has led to what is known as global warming.

There are also a number of other gases that are released into the ozone layer when we burn fossil fuels like coal. These other gases like sulfur and nitrogen oxides contribute to smog (the haziness we see in the air over cities) and acid rain.

Power companies have tried to manage this problem by building very tall chimneys, also called gas-stacks. The gases enter the exhaust stack, which contains equipment that filters out any dust and ash before venting into the atmosphere. The exhaust stacks of coal power stations are built tall so that the exhaust smoke can break up before it touches the ground. This ensures that it does not affect the quality of the air around the station. Although this helps the immediate environment around the power station, it does not help the global problem.

There are things we can do to reduce the negative effects of power stations. These include fitting equipment that filters the smoke and reduces the emissions.

The other result of generating electricity in this manner is the impact it has on our water supplies and the animal and plant life around us.

Each one of us can make a difference by not using too much electricity and by not wasting electricity. Our responsible behaviour with electricity can ensure that the greenhouse effect is reduced and that climate change is brought under control.

If we all use less, we all win.

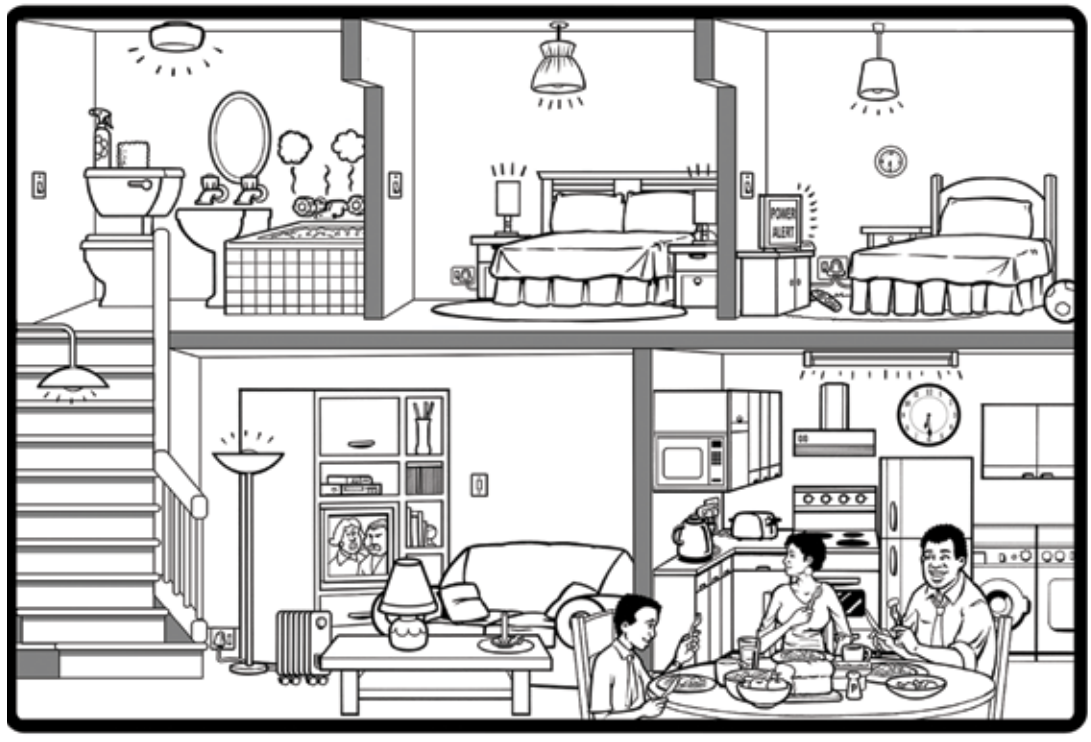
1.4 Think about some of the environmental problems that can be caused when coal is used to generate electricity. Write down the key words of your thoughts.

Using your key words write a paragraph (about 100 words) on some of the environmental problems we face by using coal as a resource to get our electricity.

1.5 Imagine that you are a presenter on television. Draw a plan in the form of a mind map to show how you are you going to present information to the public on the following topic: How is electricity generated?

Activity 3: Story

Story : Good Habits



My name is Max and this is what happened at dinner last night. Dad sat down to have dinner with mum and I. Mum had cooked a delicious dinner. Mum watched a programme on television while at the table.

Dad very politely told mum to switch off the TV. Then I shouted out, "Oh no dad, my programme is going to start now."

Dad replied in a soft but clear voice, "Sssshhhhh. Enjoy the food and not the bad thoughts that are coming from the TV. Besides it is unkind to ignore each other at the table."

"Max," said dad, "I noticed that you had left all the lights on upstairs. I kindly ask that you switch the lights off upstairs." "But why dad?," I asked.

He smiled and replied, "Every time we put something on we are using energy. We are downstairs so there is no need for the lights upstairs to be on. Nobody is watching the television upstairs. Right now we are wasting energy. Whenever we use energy and even if we are wasting energy, I have to pay for it. Besides do you know that coal is burnt to make or generate electricity? Wasting means that we are polluting the air and using up a natural resource."

"Do not waste food; do not waste water; do not waste energy; do not waste money and do not waste time. Use what we have wisely - it is the right thing to do."

"I listened to my dad and so did my mum. Although we did wrong, dad was patient and explained very clearly that saving and using energy wisely is a good habit.

1. Answer the questions on the story: Good Habits

1.1 Who is telling the story? _____

_____

1.2 Who are the people at the dinner table? _____

_____

1.3 Why do you think Max was ashamed of himself? _____

_____

1.4 What did mum do wrong? _____

_____

_____

1.5 What are the things that Max did wrong?

_____

_____

_____

_____

1.6 Which of your responsibilities can you recognise in the story?

_____

_____

_____

_____

1.7 Why is it not a good practice to waste energy?

_____

_____

_____

_____

1.8 What responsibilities did dad teach the family about energy?

1.9 List 3 other responsibilities that dad taught the family?

1.10 Was dad angry?

1.11 What makes you think so?

1.12 What did you like most about the story?

2. Read the story on your own. Retell the story in about five sentences. Write down your sentences. Your sentences should
(a) be in the correct tense (b) have the correct conjunctions and
(c) have the correct pronouns.

3. In your book write a letter to your friend telling her/him about what you have learnt from the story. First plan your letter.

4. What do you think is the biggest mistake Max made? Explain your answer.

5. Max's father thinks that "Max is a good boy." What do you think?

6. There is probably a bit of Max in all of us. Write down three values that you have learnt from the story.

Activity 3.2: Interview – Eskom TV

You are required to re-read the story of Max and his parents having dinner. Use the information provided to prepare Max for a TV interview.

- This activity is a role-play about a talk show on Eskom TV.
- The show is called - Be energy-wise.
- You are going to work in pairs for this activity.
- One of you is to be the interviewer (the one who asks the questions) and the other learner is to be Max, the guest answering the questions. The interviewer should introduce the show.
- Write down the questions that you would like to ask Max.
- Your teacher will call both of you to the front of the class to conduct the interview.

Activity 4: Story Writing

Write a story using the picture of the family - "Use energy wisely".

- Keep the following checklist in mind when writing the story.
- Tick (√) the checklist when you have completed writing the story.

Checklist for my story		
		Tick (√)
1.	My story is related to the picture and energy use.	
2.	I have planned my story.	
3.	My story is not more than 220 words.	
4.	My story has a title.	
5.	My story has an introduction.	
6.	My story has a body.	
7.	My story has a conclusion.	
8.	I have written complete sentences.	
9.	I have written in paragraphs.	
10.	I have checked my spelling.	
11.	I have checked all punctuation marks.	
12.	I have read my story two times (twice) to check for and correct any mistakes.	

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