



**Energy Education**  
Intermediate Phase (Grade 5) (CAPS)  
Learner activity sheets and resources  
Mathematics



# Energy Education



Dear Learner,

The demand for electricity is growing. Building new power stations to increase the supply of electricity is costly, takes time and is only 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 control 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: Comparing the use of energy



- Write down the differences between pictures A and B.



**A**



**B**

Picture A	Picture B
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.

## Activity 1: Comparing the use of energy



- 2.1 What is the electricity account in picture A? \_\_\_\_\_
- 2.2 What is the electricity account in picture B? \_\_\_\_\_
- 2.3 Work out the difference in the electricity accounts?  
\_\_\_\_\_  
\_\_\_\_\_
- 2.4 Give reasons why the amounts on the electricity account are different? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. Do you think the lady in picture B is doing the right thing by leaving the lights on until 8.00am? Give reasons for your answer. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. Give 2 differences between the energy saving light (compact fluorescent light – CFL) and the old light bulb (incandescent light).



**A**



**B**

Energy saving light (compact fluorescent light – CFL)	Old light bulb (incandescent light).
1.	1.
2.	2.

## Activity 2: The cost of using energy saving or old lights



**A**



**B**



1. Study picture A and picture B of the 2 ladies.
- 1.1 If the lady's electricity account in picture A is R5 using 1 energy saving light for the month, complete table 1 to show her electricity account if she uses:

	Number of energy-saving lights used for the month	Electricity account
	1 energy-saving light (CFL)	R5
1.	2 energy-saving lights (CFLs)	
2.	3 energy-saving lights (CFLs)	
3.	4 energy-saving lights (CFLs)	
4.	5 energy-saving lights (CFLs)	
5.	6 energy-saving lights (CFLs)	

*Table 1. Energy saving lights*

## Activity 2: The cost of using energy saving or old lights

- 1.2 If the lady's electricity account in picture B is R10 using 1 old bulb for the month, complete table 2 to show her electricity account if she uses:

	Number of old lights used for the month	Electricity account
	1 old bulb	R10
1.	2 old bulbs	
2.	3 old bulbs	
3.	4 old bulbs	
4.	5 old bulbs	
5.	6 old bulbs	

Table 2. Old lights

## Activity 2: The cost of using energy saving or old lights



- 2.1 Draw a pictograph to show the information in table 1. One picture should represent one unit of money in the pictograph.

Number of energy saving lights						
Cost						
Cost of using energy saving lights - R5						



- 2.2 Draw a bar graph to show the information in the table 1. Label your graph. [Y axis – cost in rand/X axis – number of energy saving lights]

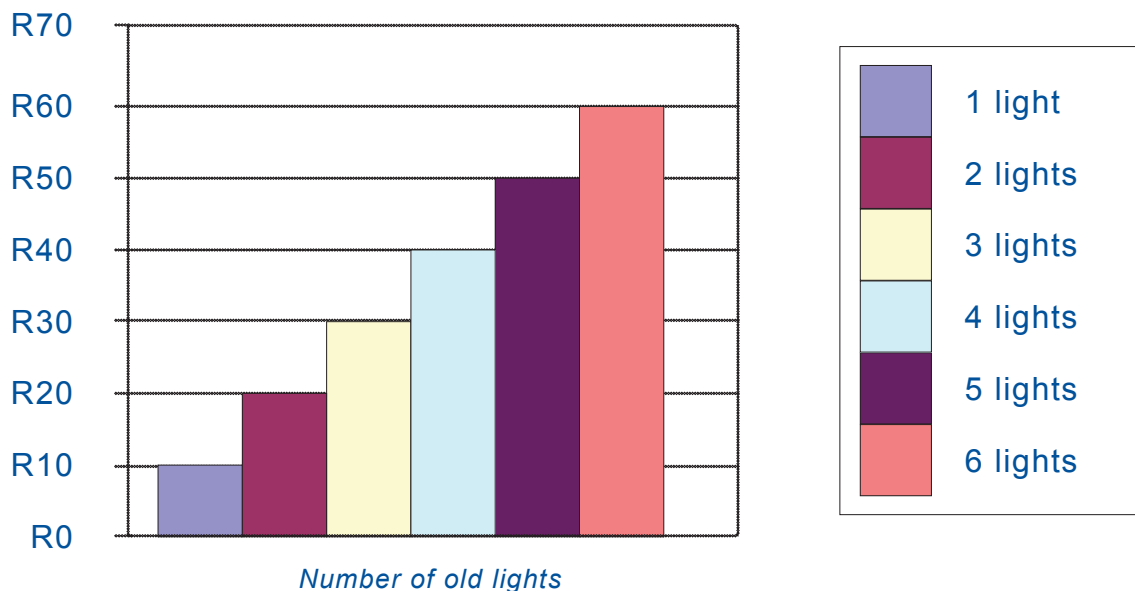


Graph showing ...

## Activity 2: The cost of using energy saving or old lights



3. Complete table 2 using the information from the graph to show the cost of using old lights.



Graph showing the cost of using old lights

	Number of old lights used for the month	Electricity account
1.	1 old bulb	
2.	2 old bulbs	
3.	3 old bulbs	
4.	4 old bulbs	
5.	5 old bulbs	
6.	6 old bulbs	

Table 2. Old lights


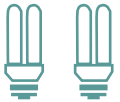


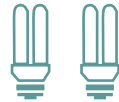


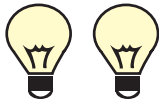



4. What 2 things can you say about the cost of electricity from the information in table 1 and table 2? \_\_\_\_\_
- \_\_\_\_\_
5. Even if you have energy saving lights, how can you use them in a way that will help to use energy wisely? \_\_\_\_\_
- \_\_\_\_\_



### Activity 3: Survey – The use of lights at Sipho's house



A survey was done at Sipho's house. The following is a floor plan of Sipho's house showing the number, kind of lights and the watt value of the lights. He switches all the lights on every day at 6.00pm and switches them off at 7.00am. The old bulbs are 60W and the energy saving lights 15W.

<b>Bedroom 1</b>  	<b>Bedroom 2</b>  	<b>Passage</b> 
<b>Kitchen</b> 	<b>Lounge</b> 	<b>Toilet</b> 
<b>Bathroom</b> 	<b>Outside</b> 	<b>Garage</b> 

### Activity 3: Survey – The use of lights at Sipho's house

- 1.1 How many old lights (incandescent bulbs) are there?  
\_\_\_\_\_
- 1.2 How many energy saving lights (energy savings) are there? \_\_\_\_\_
2. Draw a tally table for the number of old lights and the number of energy saving lights.

<b>Old lights</b>		
<b>Energy saving lights</b>		

3. Set 1: Altogether how many energy saving lights (compact fluorescent lights) are used in the bedrooms and passage?  
\_\_\_\_\_
4. Set 2: Altogether how many old lights (incandescent bulbs) are used in the garage, lounge and kitchen? \_\_\_\_\_  
\_\_\_\_\_
5. Draw a pictograph of set 1 and set 2.

<b>Set 1 - Energy saving lights</b>								
<b>Set 2 – Old lights</b>								
<b>Set of lights</b>								

### Activity 3: Survey – The use of lights at Sipho's house

6. Calculate the total watt value of the old lights (incandescent bulbs) in the house.

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7. Calculate the total watt value of the energy saving lights (compact fluorescent lights) in the house.

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8. Which lights use more energy?

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9. Sipho found that his electricity account is very high. Give Sipho some advice on how he can bring down his electricity account.

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## Activity 4: Survey of lights used by learners



Find out how many learners (in your class) use the old bulbs and how many learners use energy saving lights at home. Your teacher will help you. Complete the table to record all the necessary information about electricity and about your findings.

	<b>Survey: Different types of lights used by learners at home</b> <b>Grade:</b> _____ <b>Date:</b> _____	
1.	Number of learners in class	
2.	Number of learners who have electricity at home	
3.	Number of learners who do not have electricity at home	
4.	Number of learners using only the old bulbs at home	
5.	Number of learners using only the energy saving lights at home	
6.	Number of learners who use both old lights and energy saving lights at home	

## Activity 4: Survey of lights used by learners

1. How do you know that all the learners in the class took part in the survey? \_\_\_\_\_  
\_\_\_\_\_
2. Draw a tally table for numbers 4, 5 and 6 in the survey.


Learners using old lights		
Learners using energy saving lights		
Learners using energy saving lights and old lights		

3. Which group of learners is using the most amount of electricity?  
\_\_\_\_\_
4. Which group of learners is using the least amount of electricity? \_\_\_\_\_
5. Why do you think that your answer to 3 and 4 may not be totally correct?  
\_\_\_\_\_  
\_\_\_\_\_

## Activity 5: Using energy wisely – The television



1. Gather the following information from your class by completing the survey below.

Survey: Television			
Date of survey:			
Survey conducted by:			
Grade:			
Total number of learners in class:			
No.	Item	Number	Percentage
1.	How many learners are there in class?		
2.	How many learners have a television (TV) at home?		
3.	How many learners do not have a television at home?		
4.	How many learners switch the television on and off using the remote control?		
5.	How many learners switch the television on and off using the switch on the television?		
6.	How many learners switch the television on and off sometimes using the switch on the television and sometimes with the remote?		

2. Why is it important to find out how many learners do not have televisions at home? \_\_\_\_\_  
\_\_\_\_\_
3. Sometimes not having a television is an advantage.  
List some of the advantages of not having a television.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Activity 5: Using energy wisely – The television







4. Draw a bar graph to show the information for questions 4, 5 and 6 of the survey. Label your graph. [Y axis – Number of learners/X axis – Switching the TV on and off]



*Graph showing how learners switch the TV on and off*



5. Complete the pictograph to show the information for questions 4, 5 and 6

Remote 		
TV switch 		
Remote & TV switch  		
TV on and off – remote or switch or both		

## Activity 5: Using energy wisely – The television



6. What can you say about the way learners switch the TV on and off? \_\_\_\_\_

\_\_\_\_\_

7. What do you think is the correct way to switch the TV on and off? \_\_\_\_\_

\_\_\_\_\_

8. Write down the **golden rule** for the use of electricity.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

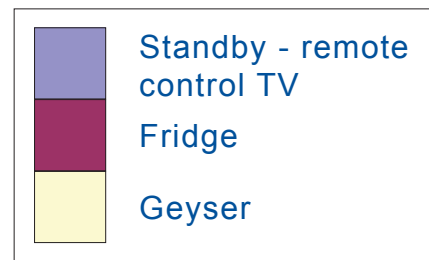
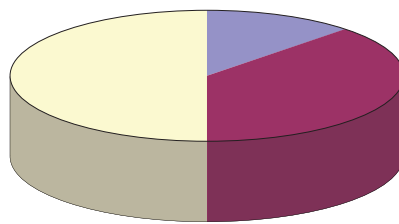


## Activity 6: What uses the most electricity at home?



Read the information in the pie chart and answer the questions. The pie chart shows the amount of energy used by 3 appliances.

Keep in mind that as long as energy is flowing through or a light is on you are using electricity and have to pay for it. **You pay for the electricity you use.**



- Which 3 appliances are shown in the pie chart?  
\_\_\_\_\_
- Which appliance do you think takes up the most amount of energy in a house? \_\_\_\_\_  
\_\_\_\_\_
- Which appliance takes up the second most amount of energy in a house? \_\_\_\_\_  
\_\_\_\_\_
- Which appliance takes up the third most amount of energy in a house? \_\_\_\_\_
- Complete the table for the geyser which shows the fraction of energy used by the different appliances.

## Activity 6: What uses the most electricity at home?

Appliance	Time left on for the day	Energy used	Cost
Fridge	24 hours	2/6	[R16]
TV on stand-by (switched off with the remote-control)	24 hours	1/6	[R8]
Geyser	24 hours		[R24]



5.1 Which appliance do you think takes up the most amount of energy in a house? Explain why you have chosen that appliance. \_\_\_\_\_

\_\_\_\_\_


5.2 Which appliance takes up the second most amount of energy in a house? Explain why you have chosen that appliance.

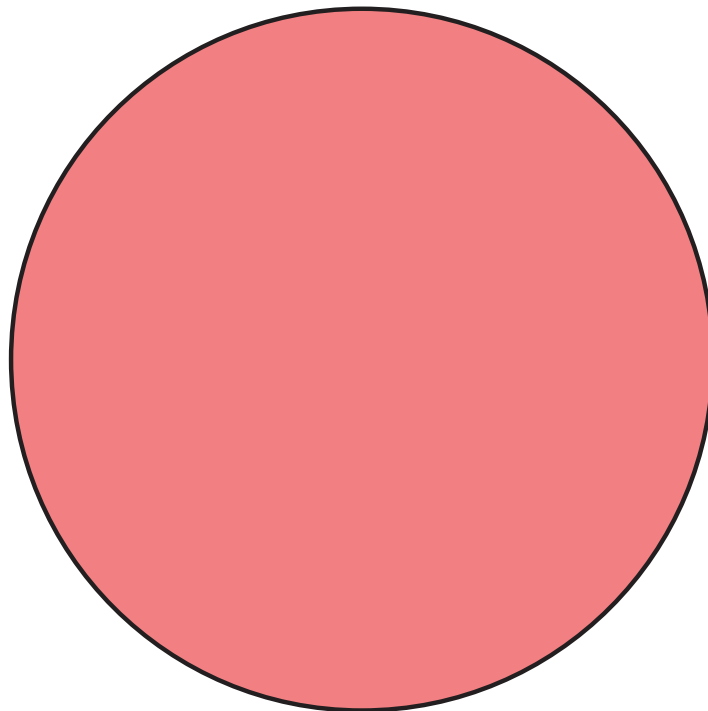
\_\_\_\_\_

5.3 Which appliance takes up the third most energy in a house? Explain why you have chosen that appliance. \_\_\_\_\_

\_\_\_\_\_

## Activity 6: What uses the most electricity at home?

- 5.4 Although the television is switched off, why is there still a cost or payment? \_\_\_\_\_
- 5.5 What is the energy-wise way to switch off the television? \_\_\_\_\_
- 5.6 Draw a pie chart to show the amount paid for the electricity used by each appliance - television, geyser and fridge. Label your pie chart.
-  5.7 Complete the pictograph to show the amount paid for each appliance. One picture should represent one unit of money in the pictograph.



## Activity 6: What uses the most electricity at home?



Television					R8
Fridge					R16
Geyser					R24

Cost of using appliances

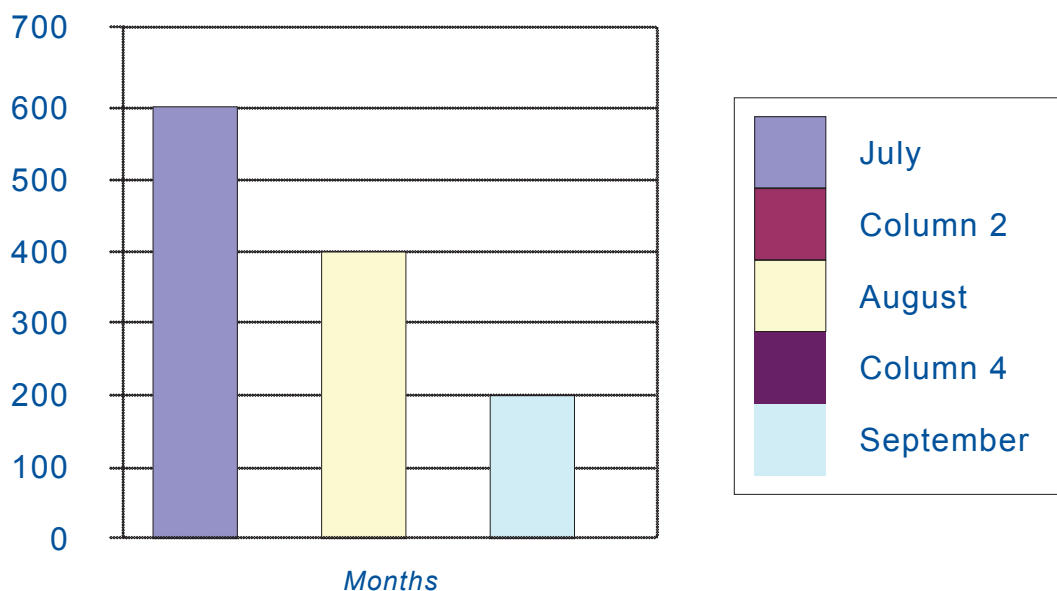


R2

## Activity 7: Electricity accounts – you pay for the electricity you use



The following bar graph shows the electricity account for a family of 5 living in a three bedroom house in South Africa. They use heaters in winter and their air conditioners are on in summer.



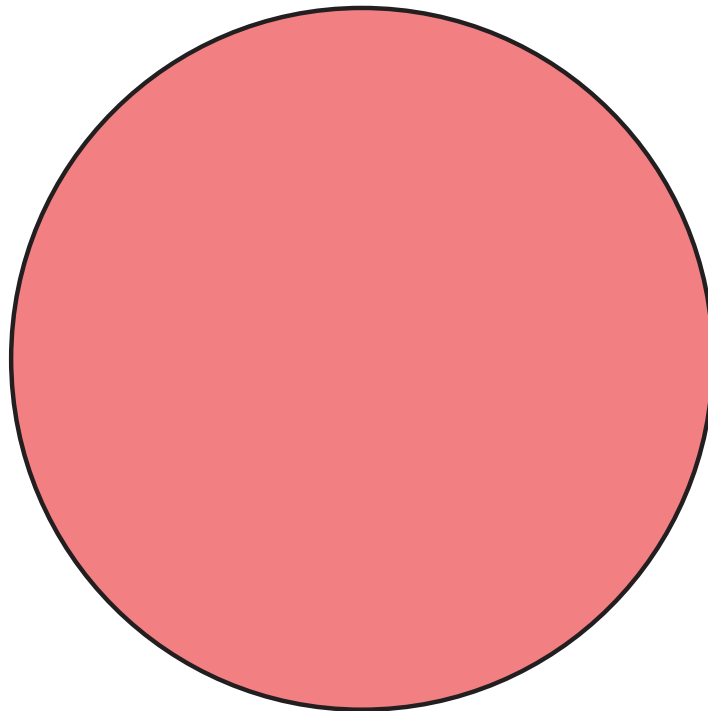
1. Complete the table below using the information from the graph.

Month	July	August	September	Total
Account				

## Activity 7: Electricity accounts – you pay for the electricity you use



- 2 Draw a pie chart to show the electricity account for July, August and September. Label your pie chart.



*Pie chart: Electricity account for 3 months*

## Activity 7: Electricity accounts – you pay for the electricity you use



- 2.1 In which month was the most amount of electricity used? Why do you think this was the case? [Remember when the seasons start and finish in South Africa].
- 2.2 Explain why the electricity account in October is likely to be far less than July?
- 2.3 Why do you think that the electricity account for January can be as high as for August?
- 2.4 Write down ways in which the electricity account can be brought down in July and January by reading the information below, by applying what you have learnt about energy-saving lights and energy saving tips.

## **Activity 7: Electricity accounts – you pay for the electricity you use**

Technology that uses electricity to make us feel warm in winter or cool in summer can use a lot of energy. There are other ways to keep warm or cool.

### **Winter:**

- Use blankets and warm clothes.
- Eat food while it is fairly warm.
- Make certain that windows are closed tightly and any spaces under the door are covered. This prevents cold air from coming into the house and warm air from leaving the house.
- Open the curtains as soon as the sun rises to warm up the house.

### **Summer:**

- Use light clothes and drink lots of water.
- Open the curtains much later or keep the curtains closed to filter the sunlight keeping the house cooler for much longer.
- Switch off the lights as soon as there is enough light. In summer the sun rises early.
- When using an air conditioner make certain that windows are closed tightly and any spaces under the door is covered. This prevents the cool air from leaving the house.
- Also remember the temperature usually drops in the evenings – so you can turn off the air conditioner for a while.