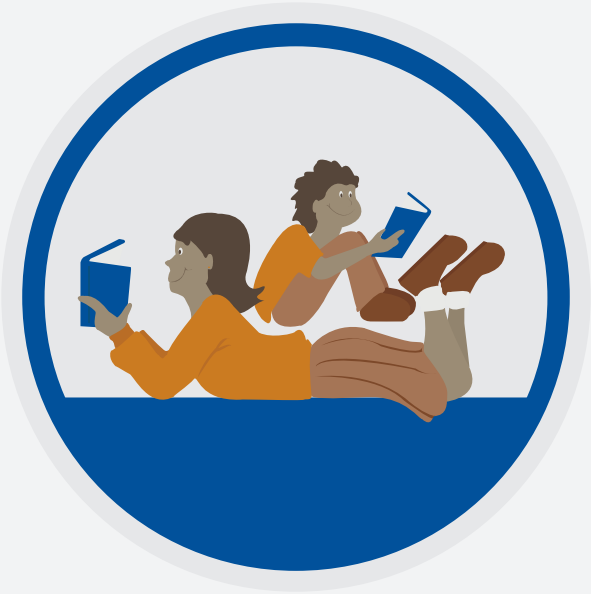


Energy Education

Intermediate Phase (Grade 6) (CAPS)

Learner activity sheets and resources

Mathematics

Eskom

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:

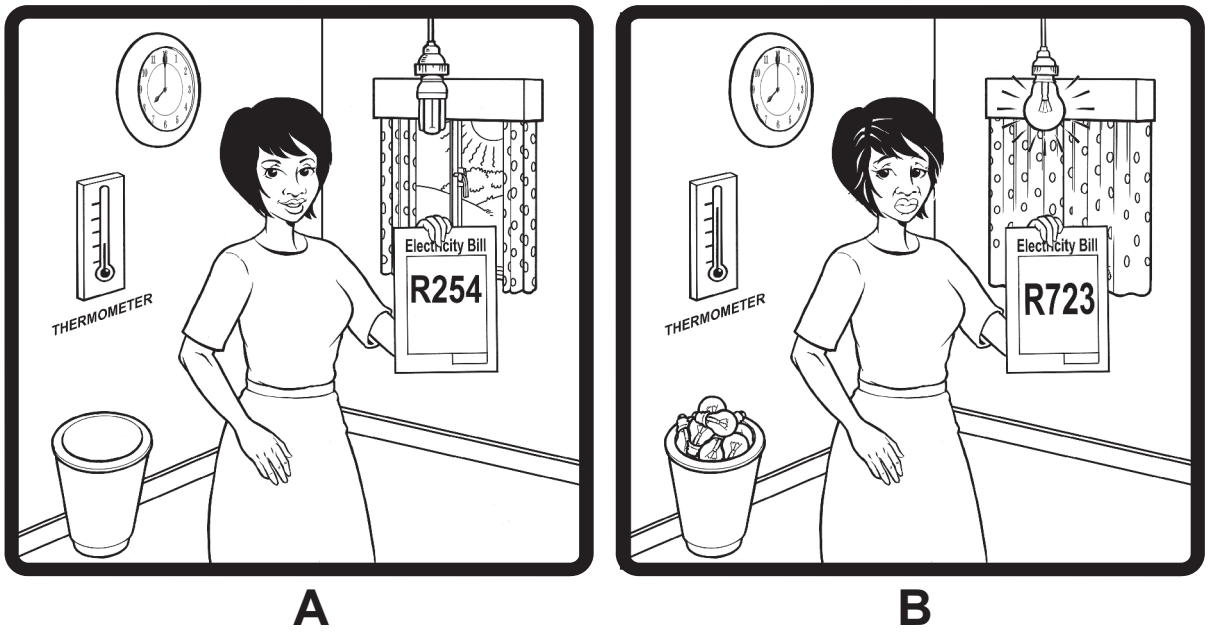
- the changes in technology (use energy-saving lights instead of the traditional old lights),
- how to use technology more wisely (using the switch to switch off remote controlled appliances instead of the remote),
- other energy-wise saving tips,
- and how using energy wisely helps to care for our *environment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

Do not worry 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. 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: Which lights should we use?

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

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

2.3 Work out the difference between the electricity accounts.

_____

2.4 Give reasons why the amounts on the electricity accounts 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).

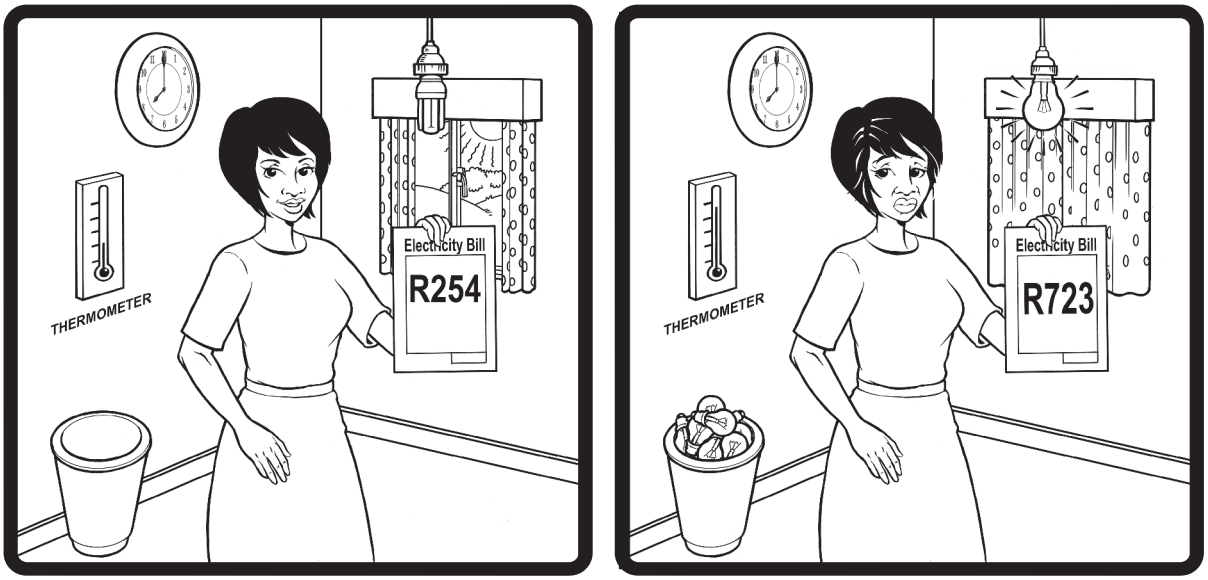
A 

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 lights or old light bulbs

1. Study picture A and picture B of the 2 ladies.



A B

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 lights or old light bulbs

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

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

Table 2. Old light bulbs

Activity 2: The cost of using energy-saving lights or old light bulbs

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						

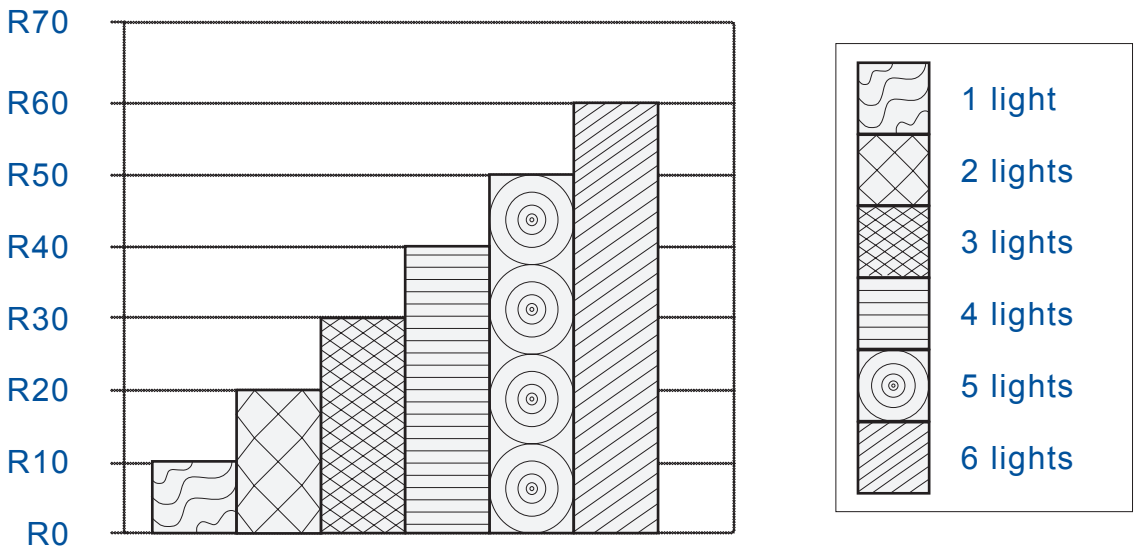
Cost of using energy-saving lights. **One unit =** 5RAND **R5**

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 the cost of using energy-saving lights

Activity 2: The cost of using energy-saving lights or old light bulbs

3. Complete table 3 using the information from the graph to show the cost of using old light bulbs.



Graph showing the cost of using old light bulbs

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

Table 3. Old light bulbs

4. What 2 things can you say about the cost of electricity from the information in tables 1 and 3? _____

_____

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 light bulbs are 60W and the energy-saving lights 15W.

Bedroom 1 	Bedroom 2 	Passage 
Kitchen 	Lounge 	Toilet 
Bathroom 	Outside 	Garage 

1.1 How many old light bulbs (incandescent lights) are there?

_____

1.2 How many energy-saving lights (compact fluorescent lights) are there? _____

2. Draw a tally table for the number of old light bulbs and the number of energy-saving lights.

Old light bulbs		
Energy-saving lights		

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

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 light bulbs (incandescent lights) are used in the garage, lounge and kitchen?

_____

_____

5. Draw a pictograph of set 1 and set 2.

Set 1 – Energy-saving lights								
Set 2 – Old light bulbs								
Sets of lights								

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

_____

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

_____

8. Which lights use more energy?

_____

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

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

_____

_____

_____

_____

Find out how many learners (in your class) use the old light 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.

	**Survey: Different types of lights used by learners at home** **Grade:** **Date:**	
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 only using old light bulbs at home	
5.	Number of learners only using the energy-saving lights at home	
6.	Number of learners who use both old light bulbs 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 light bulbs		
Learners using energy-saving lights		
Learners using energy-saving lights and old light bulbs		

3. Which group of learners is using the most electricity?
_____

4. Which group of learners is using the least electricity?
_____

5. Why do you think that your answer to question 3 and 4 may not be totally correct? _____
_____
_____

Activity 5: Using energy wisely – The television (TV)

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

Survey: Television (TV)			
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 (TV) at home?		
4.	How many learners switch the television (TV) on and off using the remote control?		
5.	How many learners switch the television (TV) on and off using the switch on the television?		
6.	How many learners switch the television (TV) on and off sometimes using the switch on the television (TV) and sometimes with the remote?		

2. Why is it important to find out how many learners do not have televisions (TVs) at home? _____

_____

3. Sometimes not having a television (TV) is an advantage. List some of the advantages of not having a television (TV).

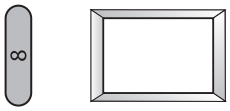
_____

_____

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 television (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, switch or both		

Activity 5: Using energy wisely – The television (TV)

6. What can you say about the way learners switch the television (TV) on and off? _____

_____

7. What do you think is the correct way to switch the television (TV) on and off? _____

_____

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

_____

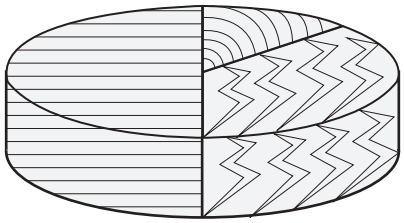
_____

_____

Activity 6: Which appliance 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**.



Standby - remote control television (TV)

Fridge

Geyser

1. Which 3 appliances are shown in the pie chart?

   _____

2. Which appliance do you think uses the most amount of energy in a house? _____

   _____

3. Which appliance uses the second most amount of energy in a house? _____

   _____

4. Which appliance uses the third most amount of energy in a house? _____

Activity 6: Which appliance uses the most electricity at home?

5. Complete the table for the geyser which shows the fraction of energy used by the different appliances.

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

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

_____

_____

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

_____

_____

5.3 Which appliance uses the third most energy in a house? Explain why you have chosen that appliance. _____

_____

_____

Activity 6: Which appliance uses the most electricity at home?

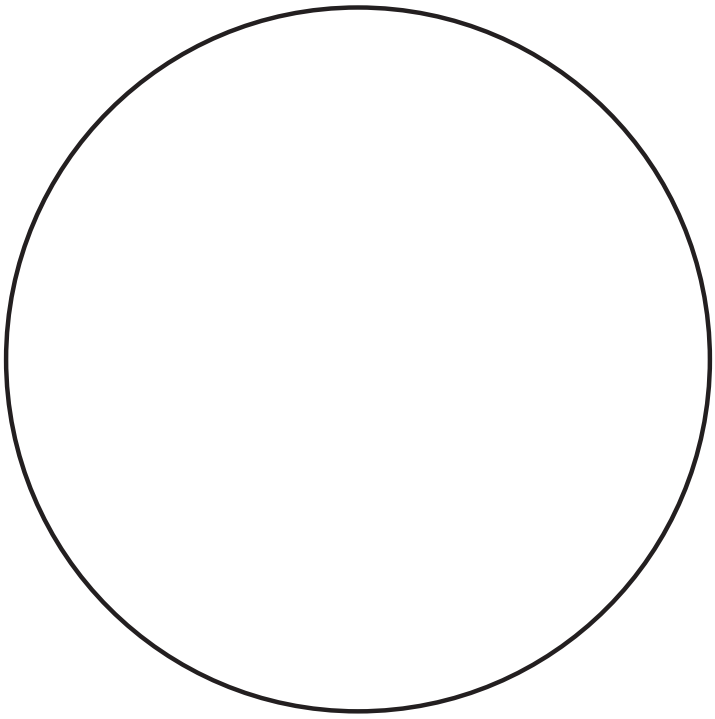
5.4 Although the television (TV) is switched off, why is there still a cost or payment? _____

_____

5.5 What is the energy-wise way to switch off the television (TV)?

_____

5.6 Draw a pie chart to show the amount paid for the electricity used by each appliance - television (TV), geyser and fridge. Label your pie chart.



Pie chart: Amount paid for the use of appliances

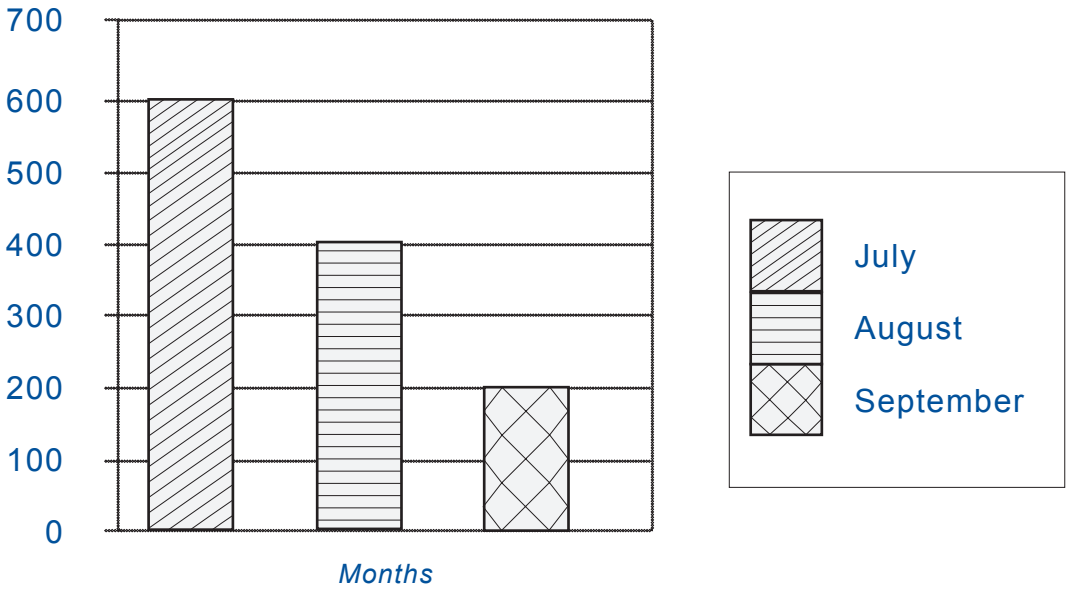
Activity 6: Which appliance uses the most electricity at home?

5.7 Complete the pictograph to show the amount paid for each appliance. One picture should represent one unit of money in the pictograph.

Television (TV)					R8
Fridge					R16
Geyser					R24
Cost of using appliances. One unit =  **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.

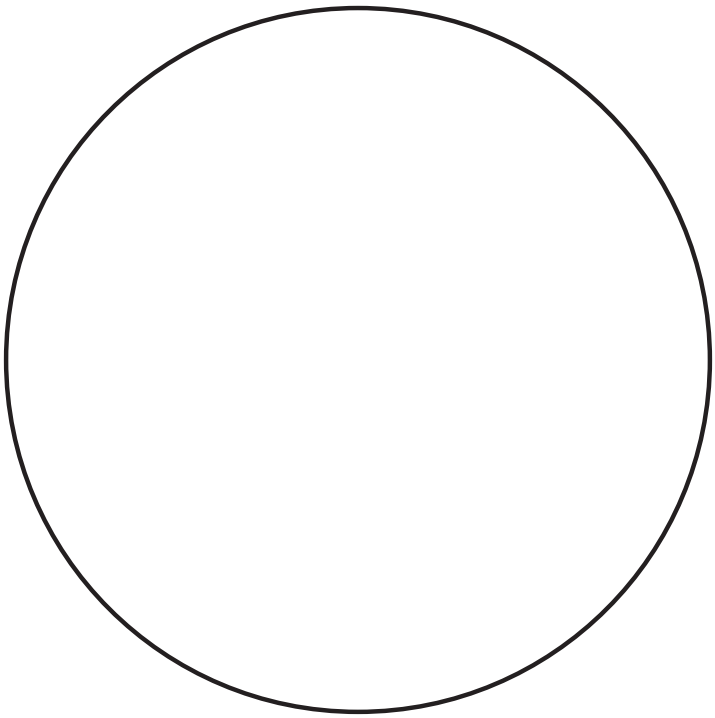


1. Complete the table below using the information from the graph.

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 electricity used? Why do you think this was the case? [Remember when the seasons start and end 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 in 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 doors 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:

- Wear 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 doors are 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.