basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

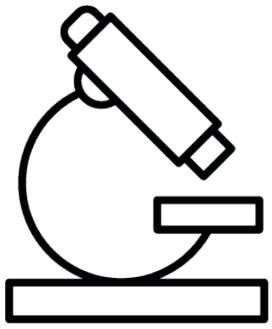
NATIONAL EDUCATION COLLABORATION TRUST

2030 NDP

Read to Lead
A Reading Nation is a Leading Nation

Planner & Tracker for Recovery ATP

Natural Sciences



Grade 7 Term 3

Table of Contents

Introduction

Dear Natural Sciences Teachers,

The COVID-19 Pandemic has left us with an enormous challenge in education. As we return to 'normal schooling', we all have to work smarter and harder to ensure that our system recovers.

This document is designed to help you achieve this. By systematically working through this plan, we are confident that you can address the loss of teaching and learning time, and bring your learners to the level where they need to be in terms of NS.

We thank you in advance for the commitment, dedication and hard work that is required of you.

You are truly building our nation.

With very best wishes for the term ahead,

The DBE / NECT Recovery ATP Trackers Team

Overview

Please continue to keep the following key principles in mind throughout the recovery journey:

- The development of **Science Process Skills** is key to the teaching and learning of the subject. Focussing on these skills is critical.

- Learners should be given as many opportunities as possible to **write regularly and read for meaning**, in Natural Science, in order to develop **language skills** as well. Due to learning losses, as a result of the Covid pandemic, it is the responsibility of every educator to develop these literacy skills.

- It is very important to give learners a sense of **how science applies to their daily lives**, and of **the value that science adds to their lives**. Hold a brief discussion on this point when introducing a new topic, and invite learners to contribute their ideas on the uses and value that this topic has.

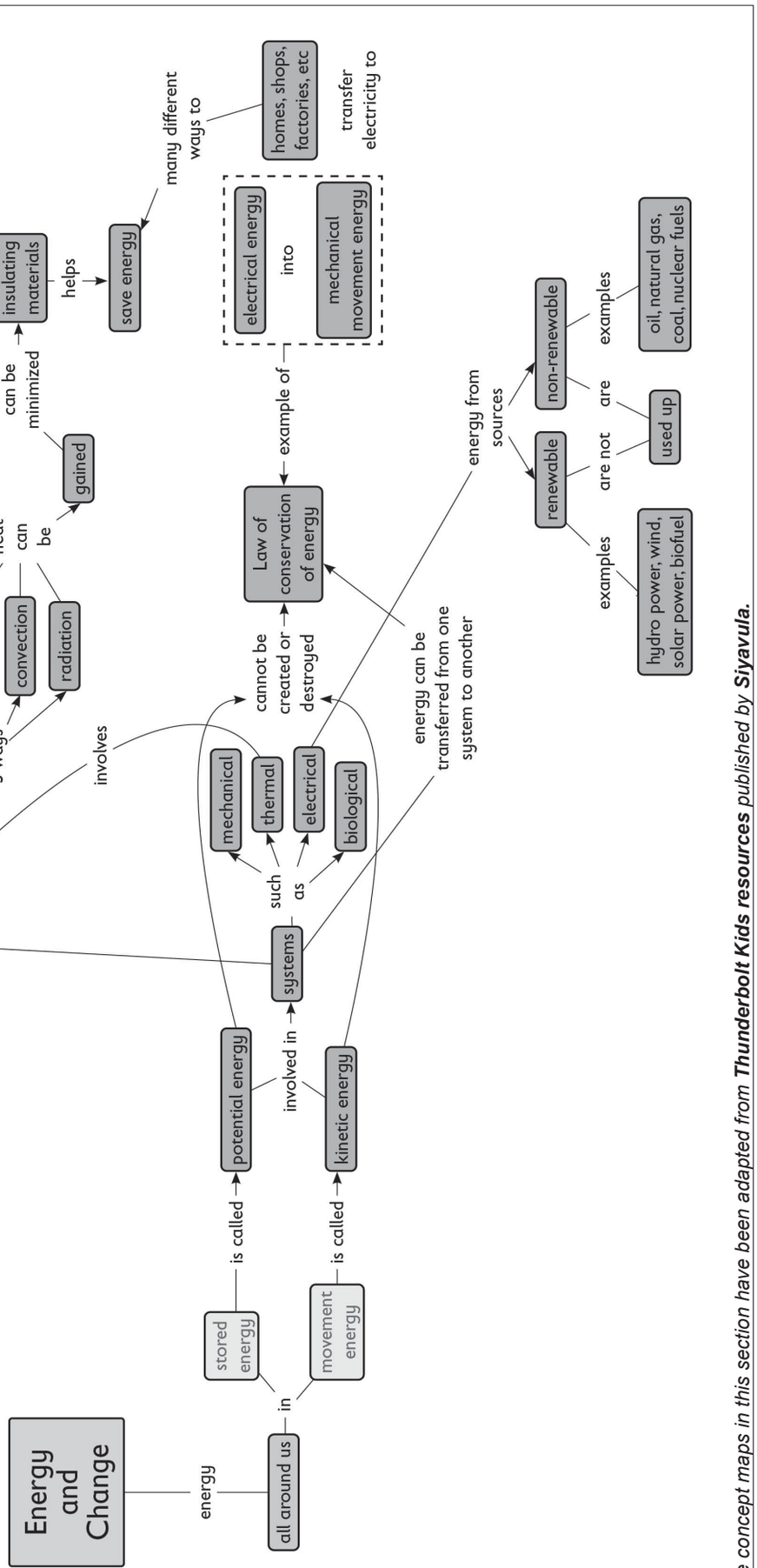
- At the end of every topic, come back to the topic overview, and **reflect on what has been learnt and taught**. In particular, it is important to note your challenges and ideas for future improvement, so that you can improve your teaching the next year.

- At the core of all scientific activities is the need to **ask questions**. These questions help us seek answers through observation and experimental design. The results of these questions should raise more questions. It is this natural curiosity that all teachers, and especially science teachers, should be encouraging in their classrooms. **Encourage curiosity** and **questions that investigate, inquire and probe.**

- **Build a solid conceptual foundation** for learners. A **conceptual chain** for the phase is provided at the start of this document. It is important for all NS teachers to work cohesively to ensure that learners are equipped with a solid understanding of the required concepts, by the time they leave the phase.

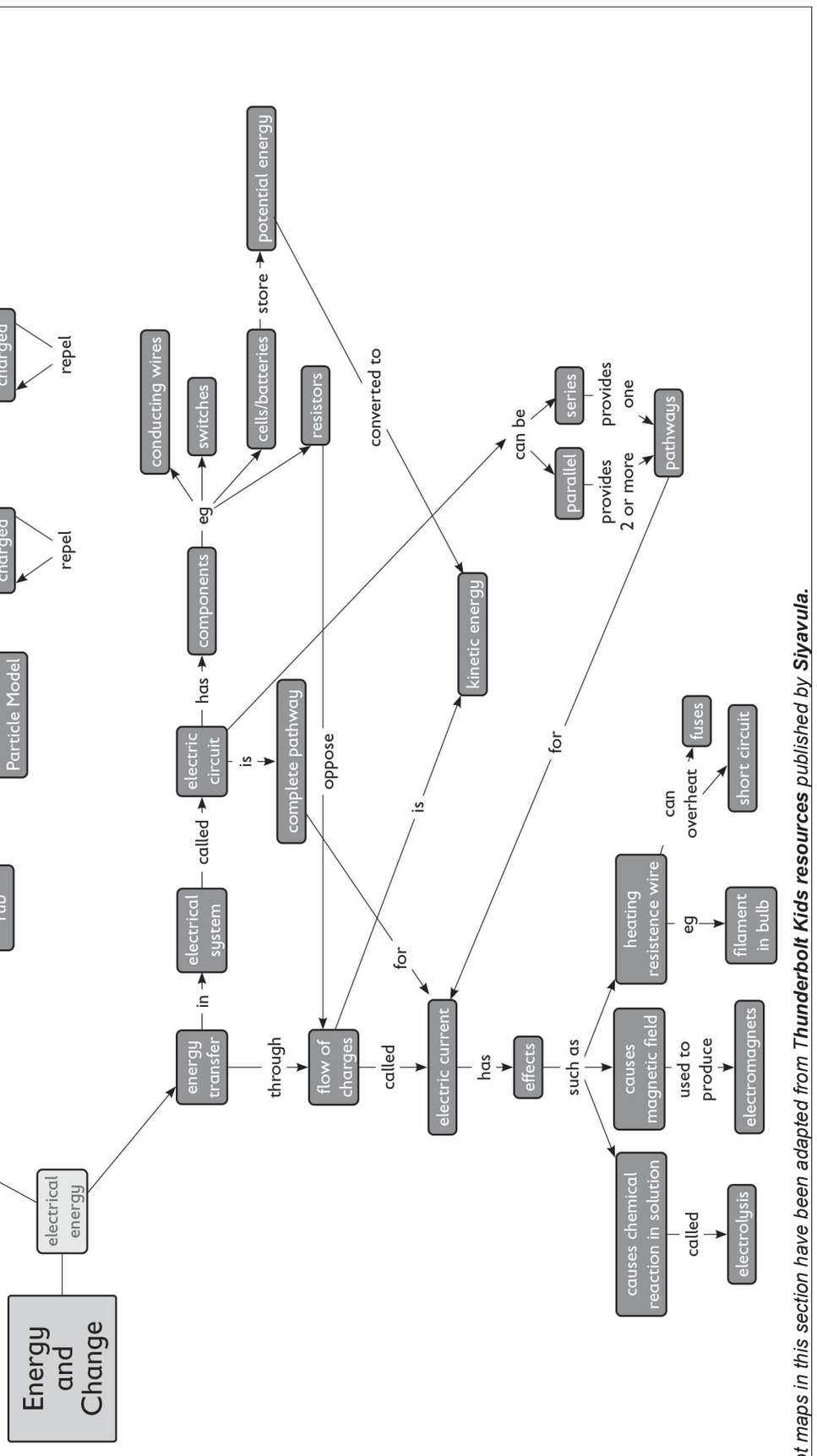
- Using the **CONCEPTUAL CHAIN** provided, **work together** as a department to:
  a. Check that all **concepts for the phase are covered** in your school's recovery plan.
  b. **Check for overlaps** across the grades.
  c. **Identify the weak links in the conceptual chain** - points where learners struggle and may be the source of misconceptions or common errors.
  d. Decide how to **emphasise critical concepts from previous grades** especially where topics have moved from a different grade in the revised ATP.

Concept Maps
Grade 7

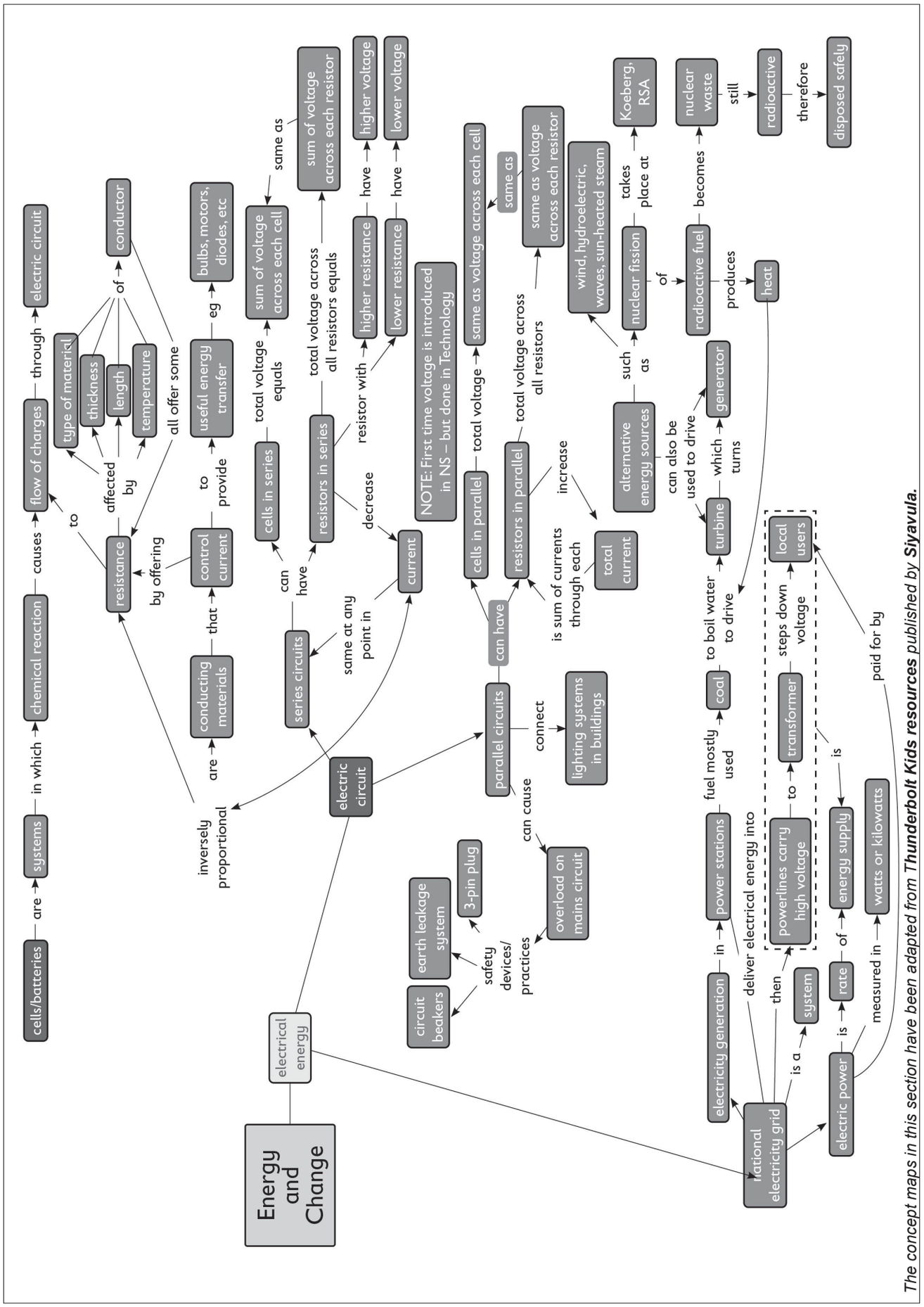


*The concept maps in this section have been adapted from **Thunderbolt Kids resources** published by **Siyavula**.*

Concept Maps
Grade 8



The concept maps in this section have been adapted from ***Thunderbolt Kids resources*** *published by* ***Siyavula.***



*The concept maps in this section have been adapted from **Thunderbolt Kids resources** published by **Siyavula**.*

Amendments to the Annual Teaching Plan

The Recovery ATP for Natural Sciences has the **same content as in CAPS**, however, this content has been arranged as follows for Term 3::

- **Some topics remain the same**:
  1. Sources of energy (1 week)
  2. Potential & Kinetic energy (2 weeks)
  3. Heat transfer (2 weeks)
  4. Insulation and energy saving (2 weeks**)**
  5. Energy transfer to surroundings (1 week)

- **Some topics have been cut out completely/removed:**
  1. The National Electricity supply system

- **Some topics from Grade 6 have been included/recovered:**
  1. Electric Circuits, Electrical Conductors and Insulators (1 week)

Directions on how to cover all required topics are provided in the Tracker that follows.

Amendments To The Programme Of Assessment

- The Programme of Assessment is aligned to the *Revised Section 4 of CAPS.*
- Both formal and informal assessment should continue as normal.
- Recording of the informal assessment is left to the discretion of the teacher.
- The 2021 formal assessment tasks for Grade 7 are as follows:

	TERM 1	TERM 2	TERM 3	TERM 4
Practical Task/Investigation/Projects	20 marks	20 marks	30 marks	-
Test	60 marks	80 marks	60 marks	80 marks

Sample Assessment Tasks and Memoranda / Rubrics for Grade 7 Term 3 are included in this document.

ATP / NECT Lesson Plan / Textbook Alignment: Grade 7 Term 3

Notes:

- **Column 1** shows the **time allocation** per topic.
- **Column 2** shows the **Recovery ATP requirements** for Grade 7 Term 3.
- **Column 3** shows **where in the NECT lesson plans** this is covered.
- **Column 4** shows **where in the approved textbooks** this is covered.
- Finally, if, for any reason, the **Term 3 teaching time** for NS **is reduced,** please ensure that the **KEY CONCEPTS** listed below each table are thoroughly covered.

Key To Approved Textbook Abbreviations:	
S&M	Study & Master Natural Sciences Grade 7 Cambridge University Press
VIVA	Viva Natural Sciences Grade 7 Vivlia
PLAT	Platinum Natural Sciences Grade 7 Maskew Miller Longman
SFA	Solutions for All Natural Sciences Grade 7 MacMillan
DbD	Day by Day Natural Sciences Grade 7 Maskew Miller Longman
OX	Oxford Successful Natural Sciences Grade 7 Oxford University Press
SO	Spot On Natural Sciences Grade 7 Pearson
TC	Top Class Natural Sciences Grade 7 Shuter and Shooter
SIBB	Sasol Inzalo Bk B Natural Sciences Grade 7 Sasol
SbS	Step-by-Step Natural Sciences Grade 7 Van Schaik
VA	Via Afrika Natural Sciences Grade 7 Via Afrika
PEL	Pelican Natural Sciences Grade 7 Global MBD Africa

ATP / NECT Lesson Plan / Textbook Alignment: Grade 7 Term 3

NOTE: These are approved Grade 6 textbooks for the included/recovered Grade 6 topics on Electric Circuits, Electrical Conductors and Insulators.

S&M	Study & Master Natural Science and Technology Grade 6 Cambridge University Press
VIVA	Viva Natural Sciences and Technology Grade 6 Vivlia
PLAT	Platinum Natural Sciences and Technology Grade 6 Maskew Miller Longman
SFA	Solutions for All Natural Sciences and Technology Grade 6 MacMillan
DbD	Day by Day Natural Sciences and Technology Grade 6 Maskew Miller Longman
OX	Oxford Successful Natural Sciences and Technology Grade 6 Oxford University Press
SO	Spot On Natural Sciences and Technology Grade 6 Pearson
TC	Top Class Natural Sciences and Technology Grade 6 Shuter and Shooter
SIBB	Sasol Inzalo Bk B Natural Sciences and Technology Grade 6 Sasoll

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS		DATE COMPLETED
Week 1 3 hours	Sources of energy 1. Renewable and non-renewable sources of energy	Gr7 Term 3 Lesson Plans Lesson 1A: Sources of energy Lesson 1B: Renewable and non-renewable sources of energy Lesson 1C: Renewable and non-renewable sources of energy	SbS Gr 7	114 - 127	
			VIVA Gr 7	191 – 201	
			PLAT Gr7	97 – 102	
			SFA Gr 7	111 – 115	
			DbD Gr 7	100 – 103	
			OX Gr 7	125 – 129	
			SO Gr 7	98 – 102	
			TC Gr 7	149 – 165	
			SIBB Gr 7	2 – 17	

Scaling down

If the Term 3 teaching time is reduced, ensure that learners have a thorough understanding of the following key content and concepts:

- Sources of energy
- Energy is needed to make everything work
- A source of energy has stored energy
- Non-renewable sources of energy - can only be used once
- Renewable sources of energy - can be re-used

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS		DATE COMPLETED
Weeks 2 & 3 6 hours	Potential & Kinetic energy 1. Potential energy 2. Kinetic energy 3. Potential and Kinetic energy in systems 4. Law of conservation of energy	Gr7 Term 3 Lesson Plans Lesson 2A: Potential energy Lesson 2B: Kinetic energy Lesson 2C: Potential and Kinetic energy in mechanical and thermal systems Lesson 3A: Potential and Kinetic energy in electrical and biological systems Lesson 3B: Law of Conservation of Energy Lesson 3C: Energy transfers	S&M Gr 7	128 – 140	
			VIVA Gr 7	202 – 219	
			PLAT Gr 7	103 – 111	
			SFA Gr 7	116 – 129	
			DbD Gr 7	104 – 109	
			OX Gr 7	131 – 142	
			SO Gr 7	102 – 111	
			TC Gr 7	166 – 185	
			SIBB Gr 7	6 – 8, 18 - 41	

If the Term 3 teaching time is reduced, ensure that learners have a thorough understanding of the following key concepts:

Potential and Kinetic energy

- Potential energy is energy that is stored in a system
- Kinetic energy is energy that a body has when it is moving
- Understand Potential and Kinetic energy in systems
- Understand the Law of Energy Conservation

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS		DATE COMPLETED
Week 4 & 5 6 hours	Heat transfer 1. Heating as a transfer of energy 2. Conduction 3. Convection 4. Radiation	Grade 7 Term 3 Lesson Plans Lesson 4A: Heating as a transfer of energy Lesson 4B: Conduction Lesson 4C: Conduction Lesson 5A: Convection Lesson 5B: Radiation Lesson 5C: Radiation	S&M Gr 7	141 – 145	
			VIVA Gr 7	224 – 228	
			PLAT Gr 7	113 – 115, 150 - 162	
			SFA Gr 7	130 – 132, 226 - 238	
			DbD Gr 7	110 – 113	
			OX Gr 7	115 – 123, 148 – 155	
			SO Gr 7	112 – 120	
			TC Gr 7	130 – 138, 186 – 190	
			SbS Gr 7	142 -151	
			VA Gr 7	110 - 119	
			PEL Gr 7	188 - 201	
			SIBB Gr 7	56 - 81	

If the Term 3 teaching time is reduced, ensure that learners have a thorough understanding of the following key concepts:

Heat transfer

- Heating as a transfer of energy
- Conductors, conduction of heat and insulators of energy
- Convection and convection currents
- Radiation, reflectors and absorbers of radiant heat

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NOTES	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS		DATE COMPLETED
Week 6 3 hours	Electrical circuits 1. Electrical conductors and insulators 2. A simple circuit 3. Circuit diagram 4. Conductors 5. Insulators	***This section has been recovered from Grade 6 Term 3.***	***<u>Grade 6 Term 3 Lesson Plans</u>*** ***In Gr6 these topics are covered from Lesson 1A to Lesson 4B.*** ***The main content for recovery is in the following lessons.*** ***Lesson 1B: A simple circuit*** Lesson 2C: Drawing circuit diagrams Lesson 3B: Test materials for conductivity Lesson 4A: Test materials for insulation	S&M Gr 6	98 – 108	
				VIVA Gr 6	112 – 122	
				PLAT Gr 6	114 – 133	
				SFA Gr 6	187 – 206	
				DbD Gr 6	116 – 127	
				OX Gr 6	87 – 97	
				SO Gr 6	53 – 60	
				TC Gr 6	93 – 105	
				SIBB Gr 6	6 - 39	

If the Term 3 teaching time is reduced, ensure that learners have a thorough understanding of the following key concepts:

Electrical circuits

Electrical conductors and insulators

- A circuit is a pathway for electricity with 3 important components – an energy source (input), conducting materials (wires), devices like motors that change electricity to useful energy (output).
- Most metals conduct electricity - Conductors
- Most non-metals do not conduct electricity - Insulators

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS		DATE COMPLETED
Weeks 7 and 8 6 hours	Insulation and Energy saving 1. Using insulating materials	Grade 7 Term 3 Lesson Plans Lesson 6A: Using insulating material Lesson 6B: Using insulating material Lesson 6C: Insulating materials Lesson 7A: Insulating materials Lesson 7B: Using Insulating materials Lesson 7C: Using Insulating materials	SbS Gr 7	152 – 154	
			PLAT Gr 7	163 - 173	
			SFA Gr 7	239 – 255	
			OX Gr 7	124 – 129	
			SO Gr 7	121 – 128	
			SIBB	82 – 105	
			TC Gr 7	139 – 146	
			VA Gr 7	120 – 125	
			PEL Gr 7	202 - 217	

If the Term 3 teaching time is reduced, ensure that learners have a thorough understanding of the following key concepts:

Insulation and Energy saving

- Understanding insulating materials and their use
- Heat loss and heat gain
- Conservation of energy in homes
- Traditional homes, technology and heat insulation

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS		DATE COMPLETED
Week 9 3 hours	Energy transfer to surroundings 1. Useful and "wasted" energy	Grade 7 Term 3 Lesson Plans Lesson 8A: Useful and wasted energy Lesson 8B: Useful and wasted energy Lesson 8C: Useful and wasted energy	SbS Gr 7	155 – 156	
			PLAT Gr 7	176 – 180	
			SFA Gr 7	257 – 259	
			OX Gr 7	130 – 131	
			SO Gr 7	130 – 132	
			SIBB	106 – 121	
			TC Gr 7	147 – 150	
			VA Gr 7	126 – 129	
			PEL Gr 7	218 - 229	

If the Term 3 teaching time is reduced, ensure that learners have a thorough understanding of the following key concepts:

Energy transfer to surroundings

- Understanding of useful energy output
- Understanding wasted energy
- Heat and sound energy as wasted energy

Below is a set of sample assessment tasks and memoranda. Please feel free to use these tasks as is, or to adapt for your context. It is important to ensure that learners are only assessed on work that has been taught.

Natural Sciences
Grade 7 Term 3
Project 30 marks

Information and instructions for the teacher

NOTES TO THE TEACHER

1. If possible, photocopy the project information for each learner. If this is not possible, write the information on the chalkboard and have the learners copy it down.
2. This project will focus on Energy and Electricity.
3. Time needs to be taken to explain the project at the beginning of term 3.
4. A due date needs to be set for submission at the end of Term 3 or early in Term 4.
5. This project is out of 30 marks.
6. The rubric for assessing the project is provided.
7. Ongoing support, encouragement and reminders should be provided for the learners.
8. The due date should be visibly displayed in the classroom.

Project
Topic: Energy And Electricity
30 Marks

Name of learner: _____

Due date: _____

INSTRUCTIONS TO THE LEARNERS

1. This project will be done in groups of four.
2. This project is made up of two parts.
3. Each person must participate in all aspects of the project.
4. Pay attention to the mark allocations. Check the rubric.
5. The marks for this project count towards term 4 assessment.
6. Read through the entire project to ensure you understand the tasks.
7. Plan your time carefully.
8. NO LATE projects will be accepted.
9. Work neatly and pay attention to your presentation.

PART 1: Data collection, presentation on a graph & conclusion.

1. Each person in your group must interview 4 people using the interview sheet below. (This means you will have 16 sets of data altogether).
2. Record the interviews you do in your workbooks or on paper. (This means you will have 4 interviews in your workbook/ on your paper).
3. Keep the interview sheet from each interview as proof of the work done if you have not written them in your workbook.
4. DO NOT go to a stranger's home alone. Try to interview friends, family, teachers and neighbours.

Interview for Data Capture

Name of person being interviewed: _____

Date of interview: _____

Place of residence: _____

Type of housing: formal / informal

QUESTIONS:

1. Do you have electricity running to your home?
2. If no, what do you use for light and cooking?
3. If yes:
   a. Do you use pre-paid electricity?

      OR

   b. Do you pay for metered electricity?

      OR

   c. Do you use an unmetered connection for your electricity?

      OR

   d. Do you use another source for electricity e.g.: solar panels?
4. If you use electricity from the National Grid (Eskom), would you prefer to use a solar panel? Why/why not?

   _____

   _____
5. Do you worry about air pollution from our coal fired power stations?

   _____
6. Do you have any general comments about electricity in South Africa?

   _____

   _____

Thank you for your time.

Part 2: Work together in your group and compare all the data you have collected:

1. Draw a bar graph showing:
    - The y-axis with the number of interviewees.
    - The x-axis with the categories of your findings.
2. The data on the x-axis should show:
    - The number of people with no form of electricity at their homes.
    - The number of people using pre-paid electricity.
    - The number of people using metered electricity.
    - The number of people using illegal connections.
    - The number of people using solar/other forms of electricity.
3. Ensure you have labelled your graph with:
    - A label on y-axis.
    - A label for each of the bars on the x-axis.
    - An overall title for your graph.
4. Now, look carefully at the data you have collected, including the areas and the type of housing. Analyse and compare the data. Then write a paragraph of 4-5 lines about what you can conclude from this data.

PROJECT ASSESSMENT RUBRIC
GRADE 7 TERM 3

Name of learner: _____

Date: _____

	Excellence achieved	Achieved	Mostly achieved	Partially achieved	Was not submitted	Total
Score	**4**	**3**	**2**	**1**	**0**	
Data collection	All interviews were conducted Data is thorough and organised Data is neat and available	All interviews were conducted There is enough data to complete graphs Data is organised	Most interviews were conducted Data is incomplete	Few interviews were completed There is insufficient data	Work was not submitted	
Graph	Graph is neat and easy to read Graph has a suitable title	Graph is reasonably neat and easy to read Graph has an adequate title	Graph is fairly neat and can be read Graph has a title	Graph is difficult to read Graph title is not correct	Work not submitted	
Graph	X axis is correct The X axis is correctly labelled All data required is correctly recorded	X axis is correct The X axis is labelled Most data required is correctly recorded	X axis is correct The X axis is labelled Not all data required is correctly recorded	X axis is incorrect The X axis may not be labelled or is incorrectly labelled Not all data required is correctly recorded	Work was not submitted	

Graph	Y axis is correct The Y axis is correctly labelled All data required is correctly recorded	Y axis is correct The Y axis is labelled Most data required is correctly recorded	Y axis is correct The Y axis is labelled Not all data required is correctly recorded	Y axis is incorrect The Y axis may not be labelled or is incorrectly labelled Not all data required is correctly recorded	Work not submitted	
Observations	Observations are clear and logical and well-constructed.	Observations show understanding of data	Observations show an understanding of most data	Limited observations and limited understanding	Work was not submitted	
Conclusions	Conclusion takes all variables into consideration and states a clear conclusion	Conclusion takes most variables into control and makes a conclusion	Conclusion considers main points but forgets some important points. A conclusion is made.	Conclusion does not consider all points.	Work was not submitted	
Presentation	Work is presented neatly and in a variety of colours – a lot of effort	Work is presented neatly with limited colours – some additional effort	Work is satisfactory – no additional effort	Work has untidy elements – limited effort	Work was not submitted	
Overall Effort	2 Good to very good effort		1 Average to poor effort		0 No work submitted	
						30 mark

Test
60 Marks
90 Minutes

NOTE TO THE TEACHER:

If possible, photocopy this test for each learner. If this is not possible, write the test on the chalkboard.

INSTRUCTIONS TO THE LEARNERS

1. Answer all questions in blue or black ink.
2. Read each question carefully before answering it.
3. Pay attention to the mark allocations.
4. Plan your time carefully.
5. Write your answers in the spaces provided.
6. Write neatly.

PRACTICE QUESTION

Read the question and circle the letter that shows the correct answer.

1. Which of the following is an example of a conductor of electricity?

    a. rubber

    b. copper

    c. plastic

    d. wood

You have answered correctly if you have circled (b)

Grade 7 Natural Sciences Term 3 Assessment

QUESTION 1: MULTIPLE CHOICE [6]

Read each question and circle the letter that shows the correct answer.

1a. Which one of these is NOT a fossil fuel?

a. coal
b. natural gas
c. uranium
d. oil

1b. Which one of the following statements is TRUE.

a. Hydro-power is a non-renewable source of energy.
b. South Africa uses a lot of renewable sources of energy.
c. Sunlight can be used to generate electricity.
d. Biofuel is produced from oil.

1c. Which one of these statements is false?

a. Potential energy is energy that is stored in an object or system.
b. The food we eat has chemical potential energy.
c. A compressed spring is an example of elastic potential energy.
d. Potential energy cannot be transferred.

1d. Which one these statements is true?

a. Heating is a process where energy is transferred from a cooler body to a hotter body.
b. Conduction is a form of heat transfer through liquids.
c. Heating is a process where energy is transferred from a hotter body to a cooler body.
d. An example of conduction is cooking a chicken on a fire.

1e Which one of these is NOT a useful insulator when building an energy efficient house?

a. Large glass windows
b. Thatch roofing
c. Foam ceiling boards
d. Hollow cement blocks

1f. In circuitry, which of the following is the symbol for a lightbulb?.

a. 

b. 

c. 

d 

QUESTION 2 - MATCH THE COLUMNS **[6]**

COLUMN A	
example	Needed by all living things to survive
2a.	Part of a heating appliance that outputs energy
2b.	An empty space that has no particles
2c.	An extremely small part of matter
2d.	Plant or animal waste used to produce energy
2e	The main source of energy in South Africa
2f	Energy that is stored.

COLUMN B	
A.	Particle
B.	Element
C.	Biofuel
D.	Vacuum
E.	Air
F.	Potential
G.	Coal

QUESTION 3 **[8]**

Write the word or words that is/are being described in the sentences below.

Only write the answer.

3a. The upward movement of heated particles and the downward movement of cooled particles in a liquid or gas during heat transfer.

_____

3b. Special waves that can transfer heat energy

_____

3c. Materials that are poor conductors of heat.

_____

3d. Energy saving light bulbs that can be used to light a room.

_____

3e. The transfer of heat energy by electromagnetic wave.

_____

3f. Energy that is produced by heat.

_____

3g. The main source of energy on Earth.

_____

3h. The metal wires inside a light bulb.

_____

QUESTION 4 **[11]**

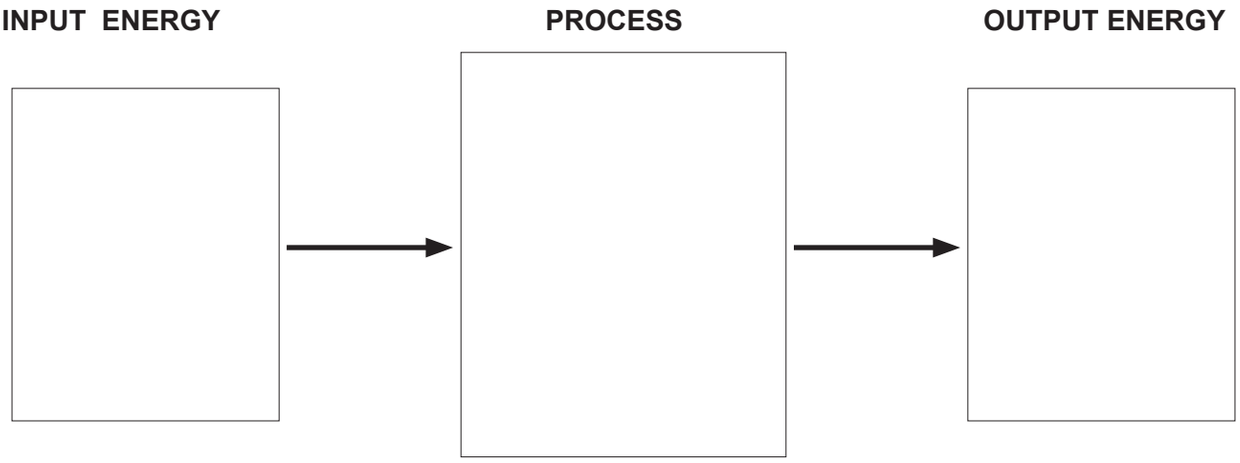
4a Identify the types of Potential Energy in each of the situations below:

- Your school bag hanging off the back of your chair. _____
- The rubber soles of your shoes. _____
- Your school lunch. _____

4b. Fill in the correct information in the flow diagram below:

The flow diagram must show the energy transfer that happen in the situation/system.

In the morning, Sam eats breakfast and then rides his bicycle to school.



4c. Explain why, in summer, it is cooler to sit in a shiny silver car rather than a dark black car.

_____

_____

4d. The Grade 7s are going on a school camp in July.

Name 2 ways that the learners could keep warm on the camp.

Explain how these 2 ways will work, in terms of heat transfer, to keep the learners warm.

_____

_____

_____

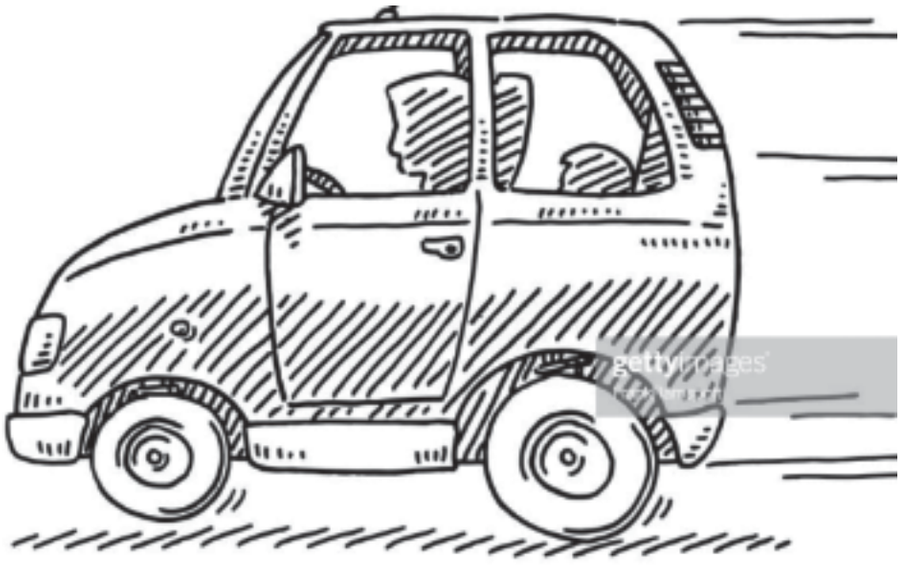
_____

_____

QUESTION 5 **[7]**

(Note to educator: This drawing can be replicated, (or Resource 19 can be used.)

Look at the drawing of the car below. The car has a petrol engine and is driving a family to a wedding:



5a. What do we call the input energy of the car?

_____

5b. The released energy is heat energy, sound energy and what other kind of energy?

_____

5c. What is the useful output energy in this situation?

_____

5d. Name one wasted output energy in this situation.

_____

5e. What is energy efficiency?

_____

5f. What does an energy efficiency of 70% mean?

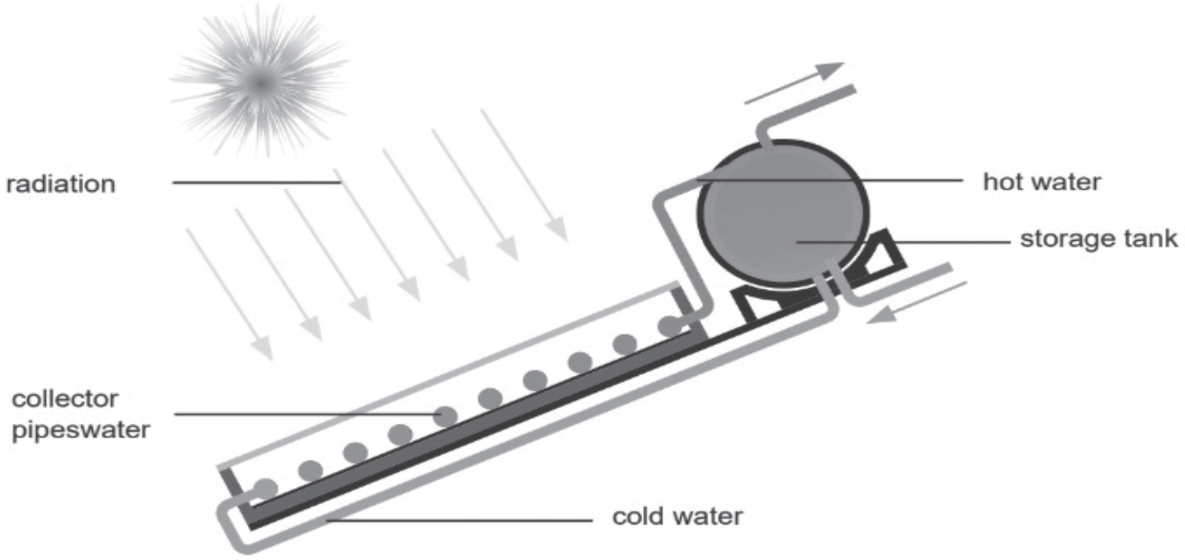
_____

_____

QUESTION 6 **[11]**

(Note to educator: The diagram below can be replicated, or Resource 10 can be used.)

Look at the diagram of diagram of a solar water heating system below:



6a. Use the above diagram, and what you have learnt, to help you explain how a solar water heating system works, using the concepts of conduction, convection and radiation.

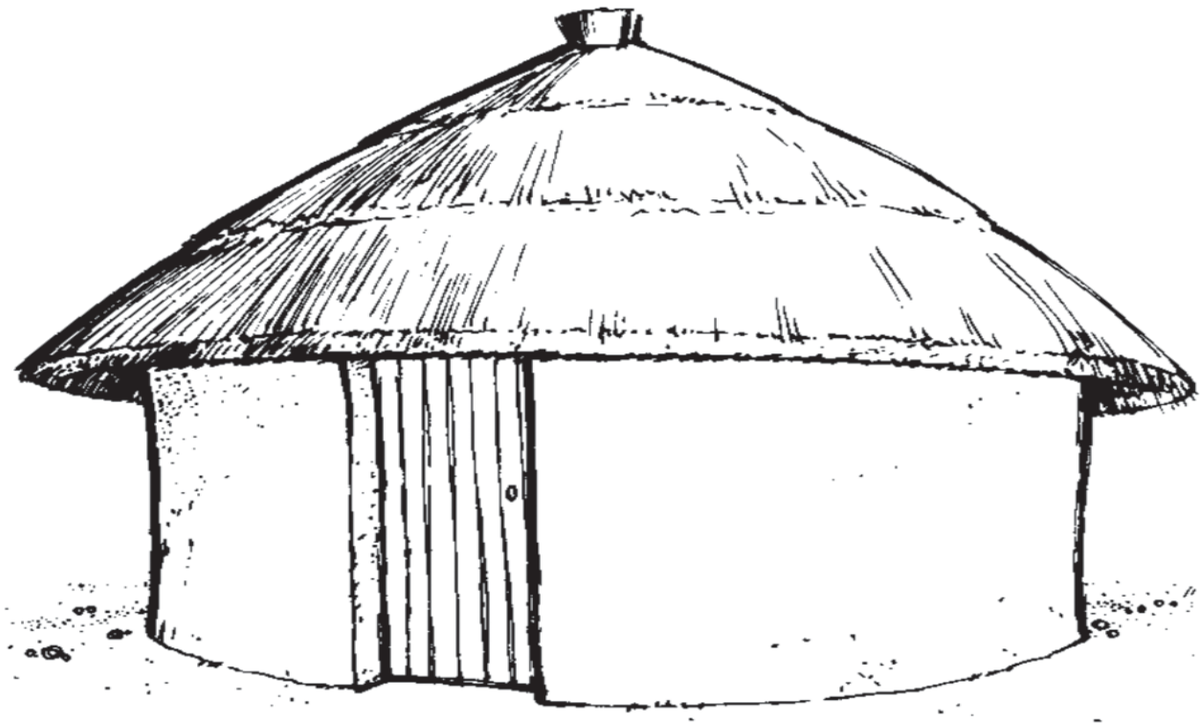
6b. Name three things that we can do in our homes to conserve energy.

QUESTION 7 **[5]**

Read the quote below:

"It has been argued that traditional Xhosa rondavels and Zulu beehive huts can teach us much about energy efficiency. It is also argued that there are more modern ways of being energy efficient."

Look at this picture of an example of a traditional hut:



7a. Explain how traditional Xhosa and Zulu buildings teach us important things about energy efficiency. Give reasons for your answer..

_____

_____

_____

_____

_____

_____

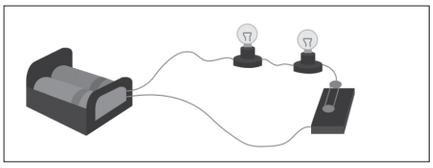
7b. Name 2 types of energy efficient bricks that we should use to build houses.

_____

_____

QUESTION 8 **[7]**

Look at the following illustration of a two bulb circuit:



8a. Draw a circuit diagram of this illustration.

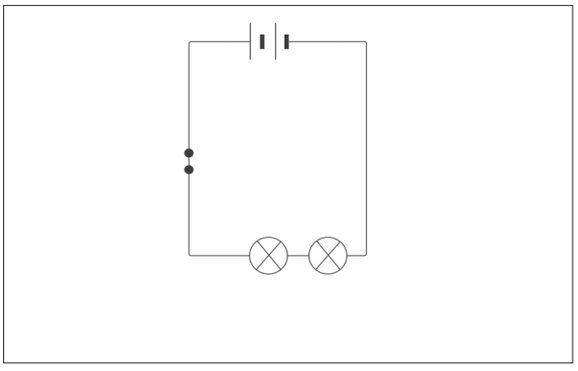
- Use a sharp pencil and a ruler.
- Use the correct symbols for the components.
- Give the circuit a title or heading.

TOTAL: 60

Term 3
Test Memorandum

CAPS Topic	Questions	Expected answer(s)	Marks
	1		
Sources of energy	1a	C ✓	1
Sources of energy	1b	C ✓	1
Potential and kinetic energy	1c	D ✓	1
Heat transfer	1d	C✓	1
Potential and kinetic energy	1e	A✓	1
Electrical circuits	1f	A✓	1
	2		
Heat transfer	2a	B ✓	1
Heat transfer	2b	D ✓	1
Potential and kinetic energy	2c	A ✓	1
Sources of energy	2d	C ✓	1
Sources of energy	2e	G ✓	1
Potential and kinetic energy	2f	F ✓	1
	3		
Heat transfer	3a	convection current ✓	1
Heat transfer	3b	electromagnetic waves ✓	1
Heat transfer	3c	insulators ✓	1
Conductors & insulators	3d	conductors ✓	1
Heat transfer	3e	radiation ✓	1
Potential and kinetic energy	3f	thermal ✓	1
Potential and kinetic energy	3g	the sun ✓	1
Conductors & insulators	3h	filament ✓	1
	4		
Potential and kinetic energy	4a	gravitational ✓elastic ✓chemical ✓	3
Potential and kinetic energy	4b	INPUT: Breakfast gives Sam chemical potential energy ✓ PROCESS: transfer of chemical potential energy to kinetic energy as Sam's legs move to pedal the bicycle. Kinetic energy from Sam's legs is transferred to the wheels as they move ✓ OUTPUT: The bicycle moves–kinetic energy ✓	3

Heat transfers	4c	Dark colours absorb heat faster. Shiny colours reflect the heat ✓	1
Heat transfer	4d	Wearing warm clothes that are dark in colour✓ They stop the warmth of our bodies transferring to the cold air and the dark colours absorb the heat ✓ Sitting around a fire ✓ The radiant heat from the fire is absorbed by our bodies. ✓	4
	5		
Energy transfer to surroundings	5a	• chemical potential energy ✓	1
Energy transfer to surroundings	5b	• kinetic energy ✓	1
Energy transfer to surroundings	5c	• kinetic energy ✓	1
Energy transfer to surroundings	5d	Must have 2 for 1 mark. ✓ • heat energy • sound energy	1
Energy transfer to surroundings	5e	The measure of how much input energy is transferred into useful output energy✓	1
Energy transfer to surroundings	5f	70% of the input energy is transferred into useful energy output ✓and 30% is lost as wasted energy ✓	2
	6		
Insulation and energy saving	6a	• Cold water flows from the bottom of the tank to the collector pipes where heat energy is transferred by radiation from the sun. ✓ • Radiant energy is absorbed in these pipes and the water gets hotter. ✓ • The collector pipes transfer the heat energy by conduction. ✓ • The water that moves through the pipes ✓ transfers the heat energy by convection.✓ • Hot water flows to the top of the tank. ✓ • Cold water sinks to the bottom of the tank. ✓ • This ensures that the water leaving the top of the tank is hot and that the cold water leaving the bottom of the tank will be heated by the collector pipes. ✓	8

	6b	Any 3 relevant things ✓✓✓ e.g. Ceilings, solar water heaters, styrofoam in walls and ceilings, thatched roofs, double glazed windows, hot boxes, flasks, hot water bottles.	3
	7		
Insulation and energy saving	7a	Answers will vary, but may include: ✓ ✓ ✓ • Southern Africa can be very hot in summer and therefore people may want to keep their homes cool. • The grass thatch keeps the heat out and the cool air inside. • The thick stone walls keep the inside of the house cool • The mud and dung floors do not get too cold. • The small door helps keeps the air temperature constant. • The small windows can be opened for ventilation.	3
	7b	• Any 2 of: Earth bricks, hollow cement bricks, concrete bricks ✓ ✓	2
	8		
Electrical circuits	8a	 e.g. A two bulb circuit or A closed circuit Allocate marks as follows: • Symbols are correct ✓ ✓ ✓ • Symbols are in correct order ✓ • Lines are straight and correct ✓ • A suitable label has been given ✓	3 1 1 1
			TOTAL: 60