

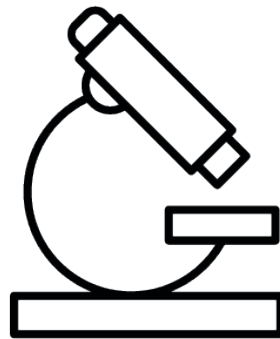


basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA



Planner & Tracker for Recovery ATP

Natural Sciences



Grade 9 Term 3

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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,

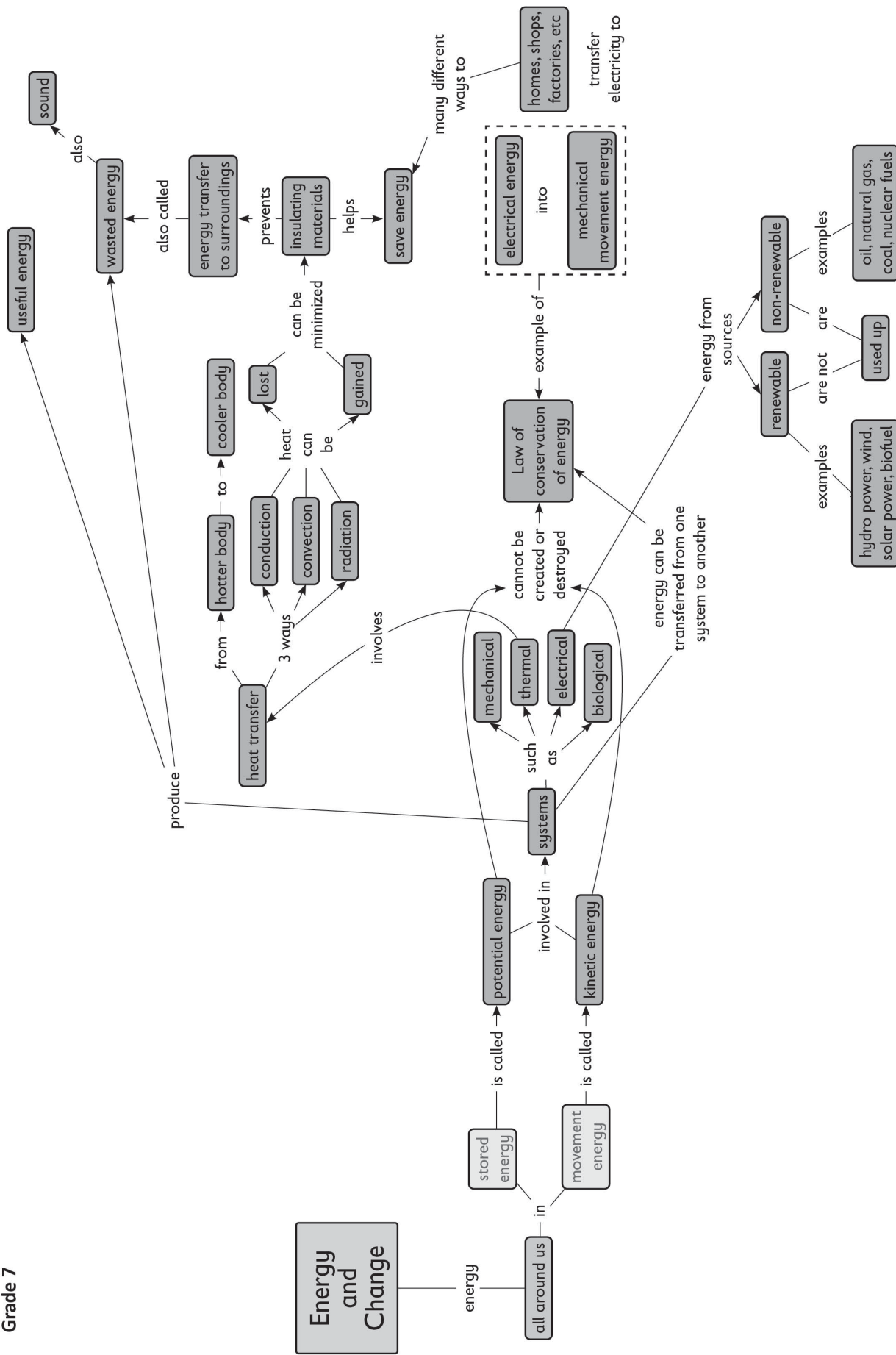
The DBE / NECT Recovery ATP Trackers Team

Overview

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

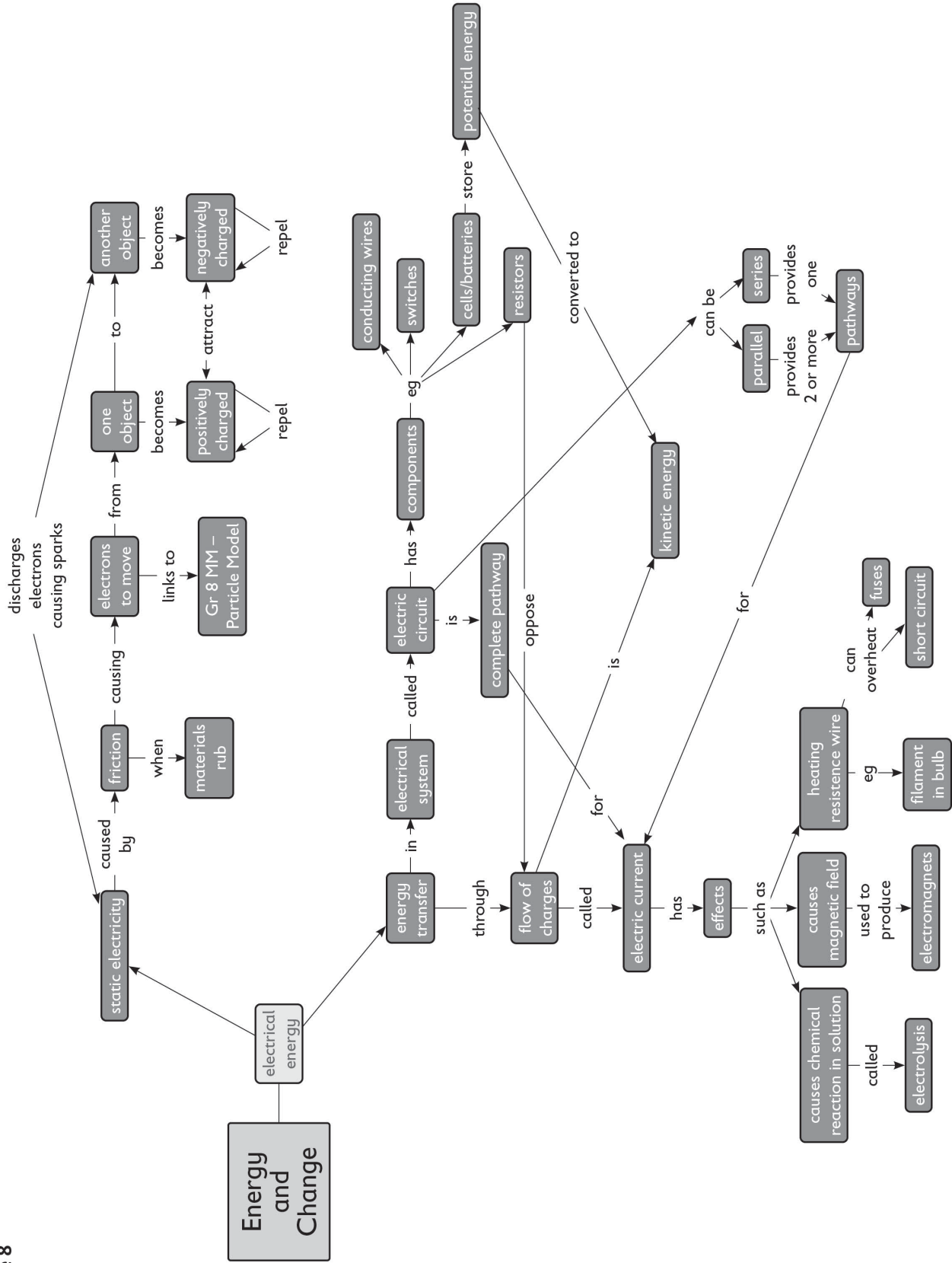
- The development of **Science Process Skills** is key to the teaching and learning of the subject. Focussing on these skills is critical.
- Learners should be given as many opportunities as possible to **write regularly and read for meaning, in Natural Science**, in order to develop **language skills** 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



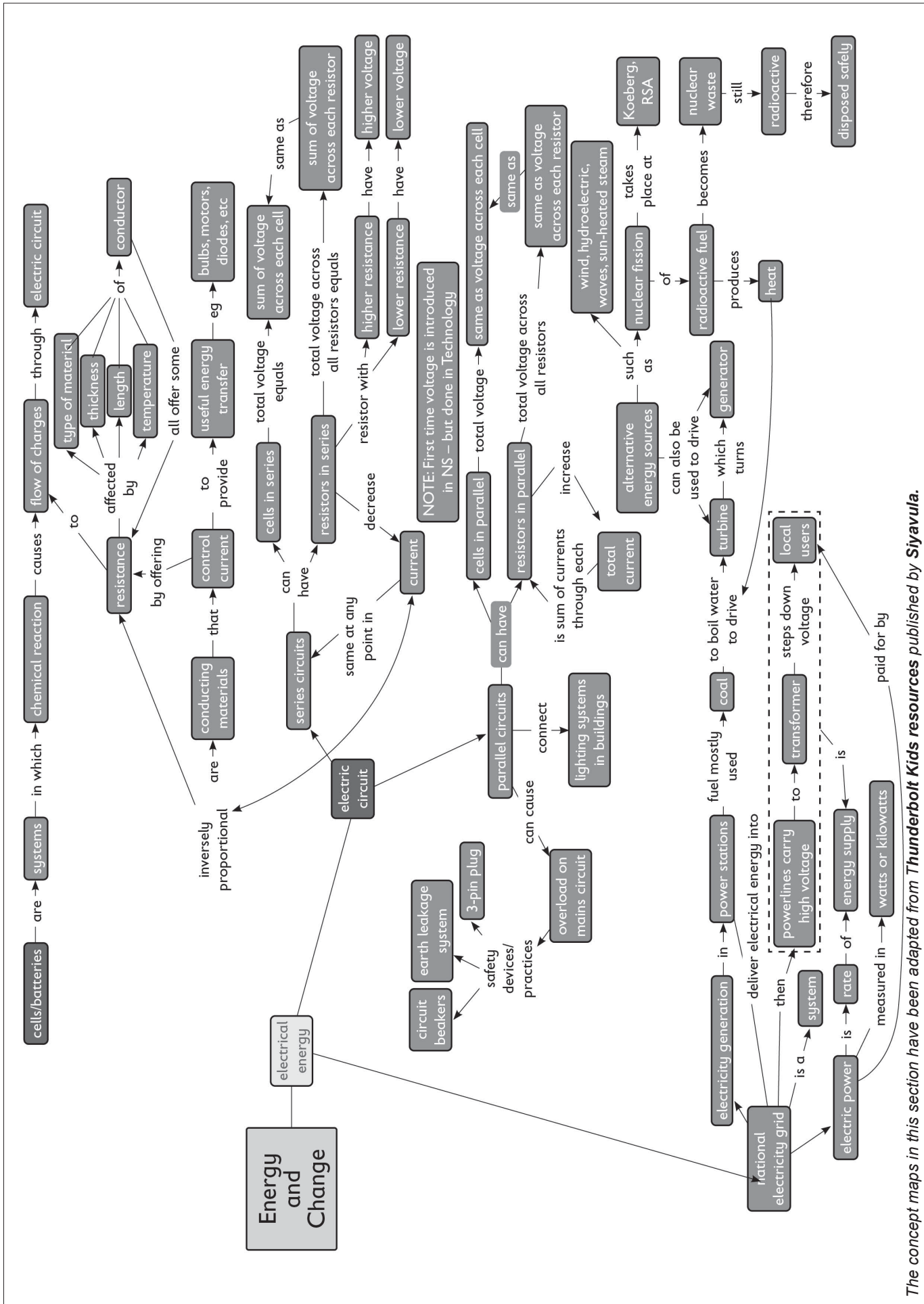
The concept maps in this section have been adapted from *Thunderbolt Kids resources* published by *Siyavula*.

Concept Maps
Grade 8



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

Senior Phase Conceptual Chain: Grade 9



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:

- All topics **remain**. However **one** topic has been **increased** in time and **one** topic has been **decreased** in time
 1. Forces (3 weeks-increased in time from 2 weeks)
 2. Electric cells as energy systems (0,5 weeks)
 3. Resistance (1 week)
 4. Series and parallel circuits (2 weeks)
 5. Safety with electricity (0,5 weeks)
 6. Energy and the National Electricity Grid (1 week)
 7. Cost of electrical power (1 week-decreased in time from 2 weeks)

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 9 are as follows:

	TERM 1	TERM 2	TERM 3	TERM 4
Practical Task/Investigation/Projects	20 marks	20 marks	30 marks	-
Test	70 marks	100 marks	70 marks	100 marks

Sample Assessment Tasks and Memoranda / Rubrics for Grade 9 Term 3 are included in this document.

Notes:

- **Column 1** shows the **time allocation** per topic.
- **Column 2** shows the **Recovery ATP requirements** for Grade 9 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:

SbS	Step-by-Step Natural Sciences Grade 9 Van Schaik
SFA	Solutions for All Natural Sciences Grade 9 MacMillan
SO	Spot On Natural Sciences Grade 9 Pearson
TC	Top Class Natural Sciences Grade 9 Shuter and Shooter
VA	Via Afrika Natural Sciences Grade 9 Via Afrika
PLAT	Platinum Natural Sciences Grade 9 Maskew Miller Longman
OX	Oxford Successful Natural Sciences Grade 9 Oxford University Press
PEL	Pelican Natural Sciences Grade 9 Global MBD Africa
SIBB	Sasol Inzalo Bk B Natural Sciences Grade 9 Sasol

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NOTES	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS	DATE COMPLETED
Week 1, 2 & 3 9 hours	<p>Forces</p> <ol style="list-style-type: none"> Types of forces Contact forces Field forces (non-contact forces) Gravitational force Magnetic force Electrostatic force 	<p><i>This topic has been increased from 2 to 3 weeks. Each lesson will now be taught for 1,5 hours. It is critical that these topics are well understood, so extra time has been allocated to ensure that all content is thoroughly covered</i></p>	<p><u>Gr 9 Term 3 Lesson Plans</u> Lesson 1A: Types of forces Lesson 1B: ContGr 9 act forces and field forces Lesson 1C: Gravitational force Lesson 2A: Magnetic force Lesson 2B: Electrostatic force Lesson 2C: Electrostatic force: Lightning</p>	<p>SbS Gr 9 145 SFA Gr 9 160 SO Gr 9 95 TC Gr 9 132 VA Gr 9 118 PLAT Gr 9 129 OX Gr 9 110 PEL Gr 9 207 SIBB Gr 9 4</p>	

Scaling down

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

Forces

- Understand the 2 broad groups of forces – contact and non-contact forces
- Understand similarities and differences between gravitational, magnetic and electrostatic forces
- Understand differences between weight and mass
- Understand how lightning happens

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NOTES	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS	DATE COMPLETED
Week 4 1 hour	Electric cells as energy systems 1. Electric cells		<u>Gr 9 Term 3 Lesson Plans</u> Lesson 3A: Electric cells	SbS Gr 9 158 SFA Gr 9 190 SO Gr 9 113 TC Gr 9 150 VA Gr 9 130 PLAT Gr 9 145 – 150 OX Gr 9 126 PEL Gr 9 231 SIBB Gr 9 60	

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

Electric cells

- Understand a cell is a system in which chemical reactions cause a flow of electricity in a circuit
- Understand cells as a source of electricity
- Understand a battery is a group of connected cells

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS	DATE COMPLETED
Weeks 4 - 5 3 hours	Resistance 1. Uses of resistors 2. Factors that affect resistance in a circuit	Gr 9 Term 3 <u>Lesson Plans</u> Lesson 3B: Resistance Lesson 3C: Factors that affect resistance in a circuit Lesson 4A: Investigate factors that affect resistance in a circuit	SbS Gr 9 160 SFA Gr 9 190 SO Gr 9 113 TC Gr 9 154 VA Gr 9 134 PLAT Gr 9 151 OX Gr 9 128 PEL Gr 9 243 SIBB Gr 9 70	

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

Resistance

- Understand what a resistor is, and how it works
- Identify uses of resistors
- Understand resistors and how they work in the flow of electric current
- Understand the factors that affect resistance in a circuit

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NOTES	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS	DATE COMPLETED
Week 5 – 7 6 hours	Series and parallel circuits 1. Series circuits 2. Parallel circuits		<p><u>Gr 9 Term 3 Lesson Plans</u></p> <p>Lesson 4B: Circuit diagrams of series and parallel circuits</p> <p>Lesson 4C: Connecting cells in series</p> <p>Lesson 5A: Connecting resistors in series</p> <p>Lesson 5B: Connecting cells in parallel</p> <p>Lesson 5C: Connecting resistors in parallel</p> <p>Lesson 6A: Series and parallel circuits in the home</p>	<p>SbS Gr 9 162 - 166</p> <p>SFA Gr 9 112 – 116, 203 – 209</p> <p>SO Gr 9 118 – 122</p> <p>TC Gr 9 159 – 171</p> <p>VA Gr 9 139 – 143</p> <p>PLAT Gr 9 161 – 173</p> <p>OX Gr 9 134 – 147</p> <p>PEL Gr 9 255 – 273</p> <p>SIBB Gr 9 96 – 113, 122, 125</p>	

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

Series and parallel circuits

- Identify, describe and draw simple series and parallel circuit diagrams
- Understand voltage in a series circuit
- Understand voltage in a parallel circuit
- Understand resistors in a series circuit
- Understand resistors in a parallel circuit
- Understand and explain why lighting systems in homes are connected in parallel

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NOTES	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS	DATE COMPLETED
Week 7 2 hours	Safety with electricity 1. Safety practices		Grade 9 Term 3 Lesson Plans Lesson 6B: Circuit breakers, fuses and earth Lesson 6C: Three-pin plugs	SbS Gr 9 167 - 170 SFA Gr 9 218 – 225 SO Gr 9 124 - 128 TC Gr 9 172 - 179 VA Gr 9 144 - 147 PLAT Gr 9 175 - 179 OX Gr 9 148 - 153 PEL Gr 9 274 - 284 SIBB Gr 9 132 - 153	

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

Safety with electricity

- Understand circuit breakers, fuses and earth leakage systems
- Be able to connect a 3-pin plug
- Identify live, neutral and earth wires in a 3-pin plug
- Understand purpose of the earth wire
- Draw a plan for wiring lights and light switches in a house

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NOTES	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS	DATE COMPLETED
Week 8 3 hours	Energy and the National Electricity Grid 1. Electricity generation 2. Nuclear power in South Africa 3. National Electricity Grid		<u>Grade 9 Term 3 Lesson Plans</u> Lesson 7A: Electricity generation Lesson 7B: Nuclear power in South Africa Lesson 7C: National Electricity Grid	SbS Gr 9 171 – 173 SFA Gr 9 226 – 235 SO Gr 9 129 – 137 TC Gr 9 180 – 186 VA Gr 9 148 – 153 PLAT Gr 9 180 – 186 OX Gr 9 154 – 159 PEL Gr 9 285 – 299 SIBB Gr 9 154 - 175	

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

Energy and the National Electricity Grid

- Understand energy generation
- Identify alternate energy sources
- Understand nuclear power in South Africa
- Understand the National Electricity Grid
- Understand power surges and grid overload

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NOTES	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS	DATE COMPLETED
Week 9 3 hours	Cost of electrical power 1. The cost of power consumption	<i>This topic has been reduced from 2 weeks to 1 week.</i> <i>Lessons 8B & 8C must be combined.</i> <i>Lessons 9A & 9B must be combined.</i> <i>Lesson 9C must be omitted.</i>	Grade 9 Term 3 Lesson Plans Lesson 8A: The cost of power consumption Lesson 8B & 8C: Measure electrical power and the cost of electrical power Lesson 9A & 9B: Compare energy consumption of appliances	SbS Gr 9 174 – 177 SFA Gr 9 237 – 247 SO Gr 9 138 – 142 TC Gr 9 187 – 193 VA Gr 9 154 – 163 PLAT Gr 9 187 – 193 OX Gr 9 160 – 163 PEL Gr 9 300 – 315 SIBB Gr 9 176 - 192	

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

Energy and the National Electricity Grid

- Understand the measuring units of electrical power – watts and kilowatts
- Understand the power rating of appliances
- Measuring the quantity of electrical power used
- Calculating the cost of electrical power
- Understand the energy consumption of different appliances

Grade 9 Natural Sciences Term 3 Assessment

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.

Project

Topic: Nuclear Energy

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 NUCLEAR ENERGY.
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. The project mark is to be used in Term 4.
6. This project is out of 30 marks.
7. The rubric for assessing the project is provided.
8. Ongoing support, encouragement and reminders should be provided for the learners.
9. The due date should be visibly displayed in the classroom.

Project

Topic: Nuclear Energy

30 Marks

Name of learner: _____

Due date: _____

INSTRUCTIONS TO THE LEARNERS

1. This project will be done individually.
2. Pay attention to the mark allocations.
3. The marks for this project count towards term 4 assessment.
4. Read through the entire project to ensure you understand the tasks.
5. Plan your time carefully.
6. NO LATE projects will be accepted.
7. Work neatly and pay attention to your presentation.

THE PROJECT CRITERIA:

- Complete the answers to the questions in your workbook.
- Submit evidence of all your interviews as proof of work. These can also be completed in your workbook.

Step-by-step:

- Write the heading “Nuclear Energy Project” on paper or at the back of your workbook.
- Complete the tasks and questions below:

Grade 9 Natural Sciences Term 3 Assessment

THE QUESTIONS AND INSTRUCTIONS:

QUESTION 1:

1. Research and explain how nuclear energy is generated.

QUESTION 2:

2. Explain what the advantages and disadvantages of nuclear energy are?

QUESTION 3:

3. Read the passage below. It is a shortened version of an article that appeared in Fin24 on 22/03/2019. Read the article at least twice and then answer the following questions:
 - 3a. Do you think nuclear energy is a suitable energy source for South Africa? Justify your answer with quotes from the article.
 - 3b. What other possible sources of renewable energy could be a suitable solution for South Africa? Give reasons for your answer.

Zuma says nuclear could've solved load shedding

Former president Jacob Zuma, whose term in government has been blamed for SA's current power outages, has said the power crisis could have been avoided if the country had built nuclear power stations.

In an interview with the Business Day newspaper on Friday, Zuma said the expensive nuclear build programme he supported during his presidency could have "solved our problems, once and for all."

Zuma, who resigned as president in mid-February 2018, said the Russians would have been the most trustworthy country to carry out the project, because of their support in the struggle against apartheid.

Plans put forward to build a second nuclear power station, with a cost thought to be around R1 trillion, were criticised as unaffordable during Zuma's presidency.

A person from the Democratic Alliance said, "Our country is in a much worse economic (money) position than we were a few years ago, we...cannot afford nuclear. We need to use different energy sources by bringing renewable energy to the grid".

Zuma's spokesperson... did not immediately reply to a request for a comment on Friday. The former president, however, told Business Day he is convinced nuclear is the right way to go.

South Africa has been experiencing rolling blackouts for the past week as Eskom struggles to generate enough power to supply demand. According to Eskom, the shortages have been caused by a lack of diesel supplies, scheduled and unscheduled outages at generation units, and the devastating effect of the cyclone that hit lines from Mozambique.

A High Court in 2017 stopped the country's nuclear plans, ruling that the processes to buy nuclear were unlawful. This application to the High Court was brought by environmental activists.

In July 2018, President Cyril Ramaphosa told Russian president Vladimir Putin that South Africa could not afford new nuclear reactors.

QUESTION 4:

4. Using the questions that follow, interview 5 adults. DO NOT go to a stranger's home alone. Try to interview neighbours, family members or people you know. Include the interview sheets as proof that the work has been completed thoroughly.

- 4a. What do you know about nuclear energy?
- 4b. What do you think the benefits of nuclear energy are?
- 4c. What do you think the disadvantages of nuclear energy are?
- 4d. Do you think nuclear energy is a good energy source for South Africa? Why/why not?

QUESTION 5:

5. Using the information from your interviews, write 1-2 paragraphs discussing your findings? Use the questions below to guide your thinking:

- 5a. Did your interviewees know a lot about nuclear energy?
- 5b. Did your interviewees know the benefits and disadvantages of nuclear energy?
- 5c. What is the opinion of your interviewees about nuclear energy?
- 5d. Do you think there is enough information available about nuclear energy for people to make informed decisions about nuclear energy?

Grade 9 Natural Sciences Term 3 Assessment

PROJECT ASSESSMENT RUBRIC

Grade 9 Term 3

Name of learner: _____

Date: _____

	Excellence achieved	Achieved	Mostly achieved	Was not submitted	Total
Score	6-5	4-3	2-1	0	
Question 1	A full and detailed explanation of how nuclear energy is generated including fuel, radioactivity, fission and generation.	Explanation is correct but lacks all details.	Explanation is incorrect, contains errors or is incomplete.	Work not submitted	
Question 2	At least 3 advantages are discussed in detail. At least 4 disadvantages are discussed in detail.	At least 2 advantages are discussed in some detail. 2-3 disadvantages are discussed in some detail.	At least 1 advantage is discussed in some detail. 1-2 disadvantages are discussed in some detail.	Work not submitted	
Question 3	A strong argument is made with quotes from the article. At least two suitable sources of renewable energy are named with logical reasons.	A reasonable argument is made with quotes from the article. At least two suitable sources of renewable energy are named with some reasoning.	An attempt at argument is made at least one reference to the article. At least one suitable source of renewable energy is named with some reasoning.	Work not submitted	
Question 4	All 5 interviews were conducted. Interviews are detailed and thorough. Information is organised and orderly.	All 5 interviews were conducted. Interviews show some detail. Information is organised.	All 5 interviews were conducted. Interviews lack detail.	Work not submitted	

Grade 9 Natural Sciences Term 3 Assessment

Question 5	<p>Clear and logical conclusions are drawn from the interviews.</p> <p>Opinions are logical and justified with evidence drawn from the interviews.</p>	<p>Some conclusions are drawn from the interviews.</p> <p>Opinions show logic and an attempt has been made to reference the interviews.</p>	<p>An attempt to draw conclusions from the interviews has been made.</p> <p>Opinions are expressed without referencing interviews.</p>	<p>Work not submitted</p>	
30 MARKS					

Test

70 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. plastic
 - b. copper
 - c. rubber
 - d. wood

You have answered correctly if you have circled (b)

QUESTION 1: MULTIPLE CHOICE

[5]

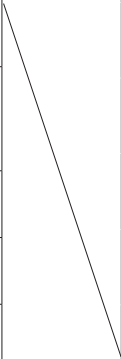
Read each question and circle the letter that shows the correct answer.

- 1a. Which one of these is NOT an example of a resistor?
- a. bulbs
 - b. motors
 - c. rheostats
 - d. copper wires
- 1b. Which of these statements is false?
- a. An atom consists of a nucleus with a cloud of positively charged electrons spinning around it.
 - b. Inside the nucleus there are positively charged protons and neutral neutrons.
 - c. The protons and neutrons are held together by very strong forces.
 - d. Atoms are electronically neutral unless electrons are added or removed.
- 1c. Which of these is an example of a field force?
- a. compression force
 - b. tension force
 - c. electrostatic force
 - d. contact force
- 1d. Which one of these statements is true?
- a. Electrical energy is energy resulting from the storage of electrical charge.
 - b. A cell stores chemical substances as potential energy.
 - c. The electrical charge that moves from the cell along the conducting wires of a circuit has low kinetic energy.
 - d. Electrical energy is not a form of kinetic energy.
- 1e. Which one of these statements is false?
- a. The energy in a lightning bolt is very high and can cause death.
 - b. Thunder is a giant spark of electricity
 - c. The movement of water droplets and air in the clouds causes friction
 - d. Static electricity has potential energy because it can do work.

QUESTION 2 - MATCH THE COLUMNS

[6]

- Match the sentences in COLUMN A with the words in COLUMN B.
- Draw a line to join the sentence in COLUMN A with the correct word in COLUMN B. Do this as shown in the example below.

COLUMN A			COLUMN B
example	Needed by all living things to survive		A. ammeter
2a.	A device that transfers kinetic energy to electrical energy		B. element
2b.	A device used to measure current		C. ampere
2c.	Unit of measure for current		D. heat
2d.	Light bulb with a wire filament		E. air
2e	The resistor in an electric kettle		F. element
2f	The wasted energy output in a light bulb		G. incandescent

QUESTION 3

[8]

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

Only write the answer.

3a. Unit used to measure resistance.

3b. An element used as fuel in the generation of electricity at nuclear power stations.

3c. Two or more cells forming a chemical system, that store electrical potential energy.

3d. What do we call a negatively charged particle?

3e. Devices that change the voltage of electricity.

3f. Devices used to measure current in a circuit.

3g. Devices that break or melt when voltage is exceeded

3h. Devices to control the current voltage through an electrical system.

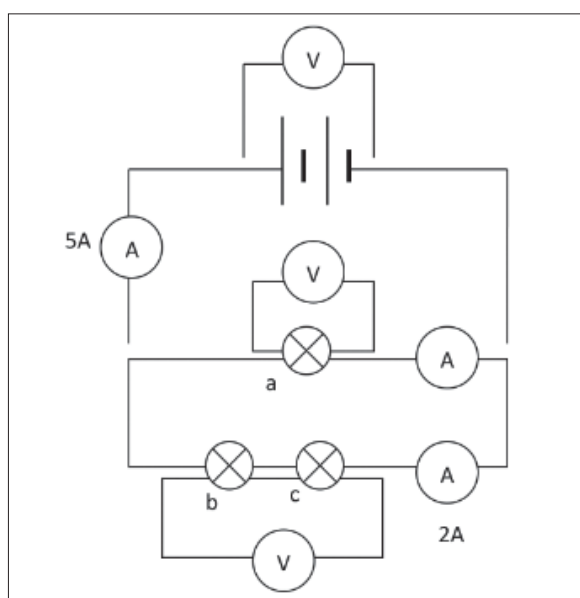
QUESTION 4

[10]

4a. Explain the difference between a series circuit and a parallel circuit, in terms of the flow of current.

Look at the diagram below and answer the questions that follow:

NOTE: All the light bulbs and the cells in the circuit are identical. V stands for voltmeter and A stands for ammeter.



4b. Write an equation that shows the relationship between voltmeters 1, 2 and 3.

4c. If the reading on ammeter 1 is 5A and the reading on ammeter 3 is 2A, what will the reading on ammeter 2 be?

4d. Which bulb will glow the brightest, a, b or c? Give a reason for your answer.

4e. If another two cells are connected in series to the existing cells, what will happen to the total voltage in the circuit?

4f. If the two cells are connected in parallel to the existing two cells, what will happen to the total voltage in the circuit?

4g. If the extra two cells are now added in parallel to the existing cells in the circuit, what will happen to the total voltage?

4h. Mphume hangs a chain of lights outside her house. The lights are connected in series.

- What will happen if one of the lights fuses or breaks?

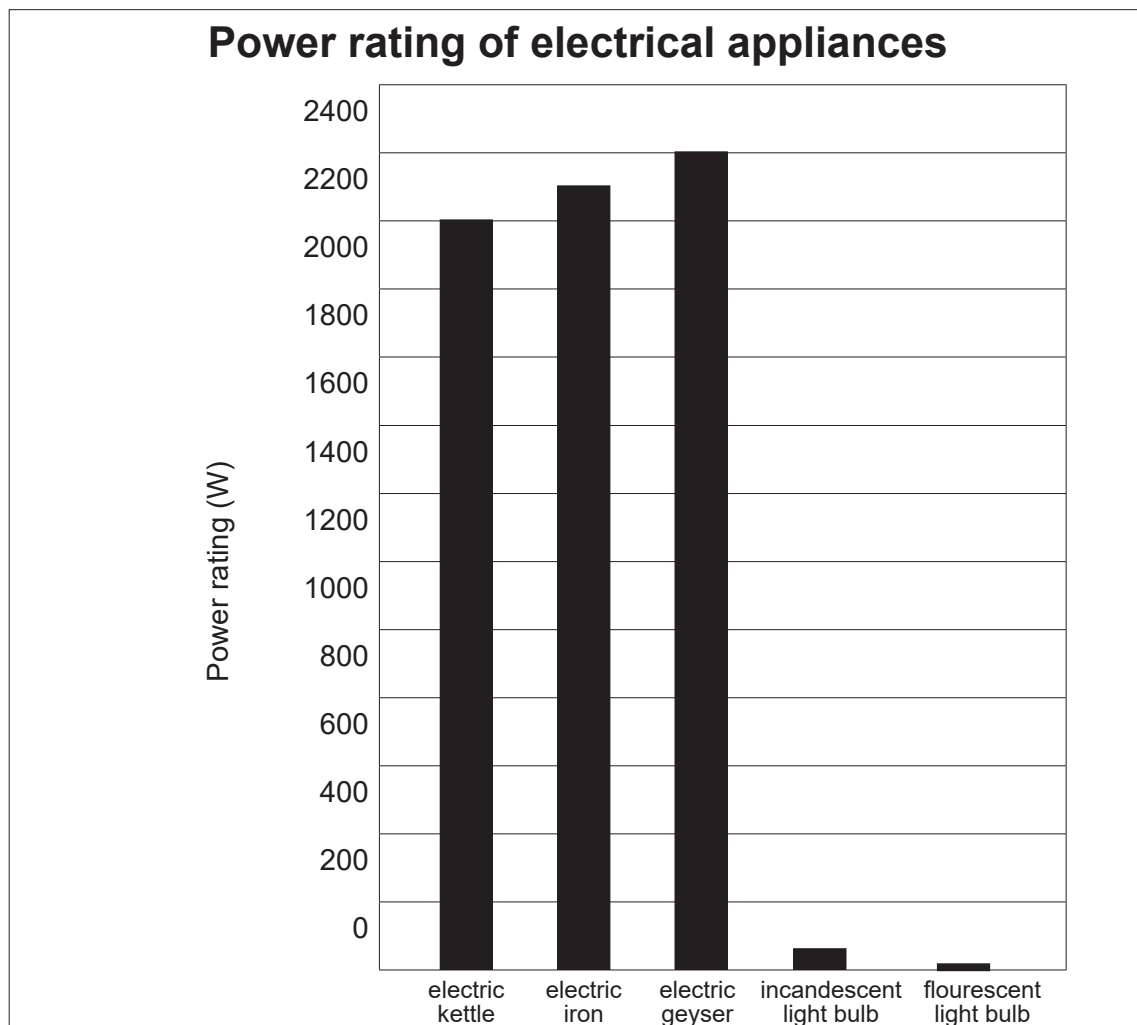
- How could Mphume fix the problem?

QUESTION 5

[10]

Look at the bar graph that shows the power rating of different appliances.

The appliances are represented on the X-axis and the power ratings are represented on the Y-axis.



Grade 9 Natural Sciences Term 3 Assessment

5a. Read the graph and fill in the missing information on the table below.

APPLIANCE	POWER RATING (Watts)
Electric kettle	(i) _____
(ii) _____	2100
Electric geyser	2200
(iii) _____	60
Fluorescent light bulb	11

5b. How long would it cost in Rands to use the electric geyser for 5 hours continuously if the cost of electricity is 180c per kilowatt hour? (Show all calculations).

5c. Would you use incandescent or fluorescent light bulbs in your home? Give a reason for your answer.

QUESTION 6

[12]

6a. Write a basic explanation as to how nuclear energy is produced.

6b. Name 1 disadvantage of nuclear energy.

6c. Name 1 advantage of nuclear energy.

6d. Considering all the forms of energy available to manufacture electricity, which two do you think are the most suitable for South Africa? Give a reason for your answer.

6e. In your opinion, are coal fired power stations a good long-term solution for energy generation? Give a reason for your answer.

QUESTION 7

[10]

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

7a. A field force as a result of differences in the electric charge of objects.

7b. The pulling force on a body, that pulls it tight (taut).

7c. A contact force that is created when two objects move over each other.

Answer the questions that follow:

7d. What 3 things can a force change in an object?

7e. Give an example, in everyday life, of a compression force.

7f. In 1969, Neil Armstrong became the first man to walk on the Moon. Explain what happened to his mass and weight on the Moon, compared to his mass and weight on Earth. Give reasons for any differences.

QUESTION 8

[10]

8a. Write the formula for how we can calculate the basic cost of electricity that we use.

8b. In South Africa, our electricity charges are on a sliding scale. What does this mean?

8c. Name 2 things that we can do to control our use of electricity and reduce the costs.

8d. How do solar heating panels help us save electricity costs?

8e. Who are the people (career) that install, wire, repair and maintain electrical components, systems and appliances?

TOTAL: 70

Grade 9 Natural Sciences Term 3 Assessment

Test Memorandum

CAPS Topic	Questions	Expected answer(s)	Marks
	1		
Resistance	1a	D ✓	1
Forces	1b	A ✓	1
Forces	1c	C ✓	1
Electric cells as energy systems	1d	B ✓	1
Electric cells as energy systems	1e	B ✓	1
	2		
Electricity and the National Electricity Grid	2a	B ✓	1
Series and parallel circuits	2b	A ✓	1
Series and parallel circuits	2c	C ✓	1
Resistance	2d	G ✓	1
Resistance	2e	F ✓	1
Resistance	2f	D ✓	1
	3		
Resistance	3a	ohm ✓	1
Energy and the National Electricity Grid	3b	uranium ✓	1
Energy and the National Electricity Grid	3c	battery ✓	1
Series and parallel circuits	3d	electron ✓	1
Series and parallel circuits	3e	transformers ✓	1
Series and parallel circuits	3f	Voltmeter ✓	1
Series and parallel circuits	3g	Fuses ✓	1
Series and parallel circuits	3h	Resistors ✓	1
	4		
Series and parallel circuits	4a	A series circuit has only 1 pathway for current to flow. ✓ A parallel circuit has 2 or more pathways for current to flow. ✓	2
Series and parallel circuits	4b	$V_1 = V_2 + V_3$ ✓	1

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Series and parallel circuits	4c	3A ✓	1
Series and parallel circuits	4d	a ✓	1
Series and parallel circuits	4e	Lightbulbs b and c will share the current through the pathway ✓	1
Series and parallel circuits	4f	The voltage will double ✓	1
Series and parallel circuits	4g	The voltage will remain the same ✓	1
Series and parallel circuits	4h	All the lights will go out ✓ Connect the lights in series or replace the faulty light. ✓	2
5			
Energy and the national electricity grid	5a	(i) 2000 ✓ (ii) electric iron ✓ (iii) incandescent light bulb ✓	3
Energy and the National Electricity Grid	5b	2200W = 2.2kW ✓ 180c = R1.80 ✓ Cost = 2.2kW x 5hrs x R1.80 ✓ Cost: R19.80 ✓	4
Energy and the National Electricity Grid	5c	(Answers may vary) Fluorescent light bulbs ✓ because they have a lower power rating and will be cheaper to use in my house. ✓	2
6			
Energy and the National Electricity Grid	6a	(Answers may vary) <ul style="list-style-type: none"> • Uranium is the element that is used in the power station. ✓ • Radioactivity produces heat during nuclear fission. ✓ • Nuclear fission is the splitting of atoms. ✓ • The heat released is used to heat water which produces steam. ✓ • This steam is used to spin a turbine which turns a generator which generates electricity. ✓ 	5
Energy and the National Electricity Grid	6b	(Any one) ✓ <ul style="list-style-type: none"> • Produces radioactive waste • Expensive 	1
Energy and the National Electricity Grid	6c	(Any one) ✓ <ul style="list-style-type: none"> • Renewable • Produces large amounts of electricity • Does not produce greenhouse gasses 	1

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Energy and the National Electricity Grid	6c	(Any one) ✓ <ul style="list-style-type: none"> • Renewable • Produces large amounts of electricity • Does not produce greenhouse gasses 	1
Energy and the National Electricity Grid	6d	(Answers will vary) <ul style="list-style-type: none"> • Solar and wind. ✓ • South Africa has an plenty of sunlight and most homes can be fitted with a solar panel at a reasonable cost. ✓ • South Africa has large open spaces that are suitable for wind turbines. ✓ 	3
Energy and the National Electricity Grid	6e	(Answers may vary) No. Coal is a non-renewable energy resource and is also responsible for large amounts of pollution. ✓ ✓	2
	7		
Forces	7a	Electrostatic force ✓	1
Forces	7b	Tension force ✓	1
Forces	7c	Friction ✓	1
Forces	7d	Shape, direction, speed ✓✓✓	3
Forces	7e	Any example where something is squeezed or squashed. ✓	1
Forces	7f	His mass was the same on Earth and on the Moon. ✓ His weight was different on the Moon, ✓ because weight depends on the strength of gravity which is different on the Moon than Earth. ✓	3
	8		
Cost of Electricity	8a	✓ ✓ Cost = power rating x no. of hours used x unit cost of electricity ✓	3
Cost of Electricity	8b	The basic cost increases at certain points ✓ as you use more electricity ✓ The more you use, the more you pay	2
Cost of Electricity	8c	(Any two relevant ways) ✓✓✓ <ul style="list-style-type: none"> • use prepaid meters and prepaid cards • use lightbulbs that are energy efficient • check the power rating of appliances – use ones with lower ratings • don't waste electricity – turn off lights and appliances when not needed etc. 	2

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Cost of Electricity	8d	Solar heating panels use renewable energy from the sun to heat water ✓ We do not use electricity to heat the water. ✓	2
Cost of Electricity	8e	Electricians ✓	1
			TOTAL: 70