

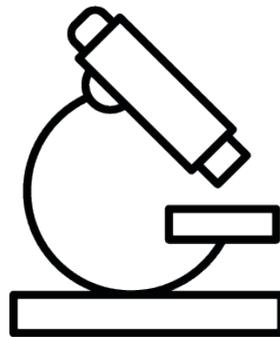


basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA



Planner & Tracker for Recovery ATP

Natural Sciences



Grade 8 Term 4

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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,

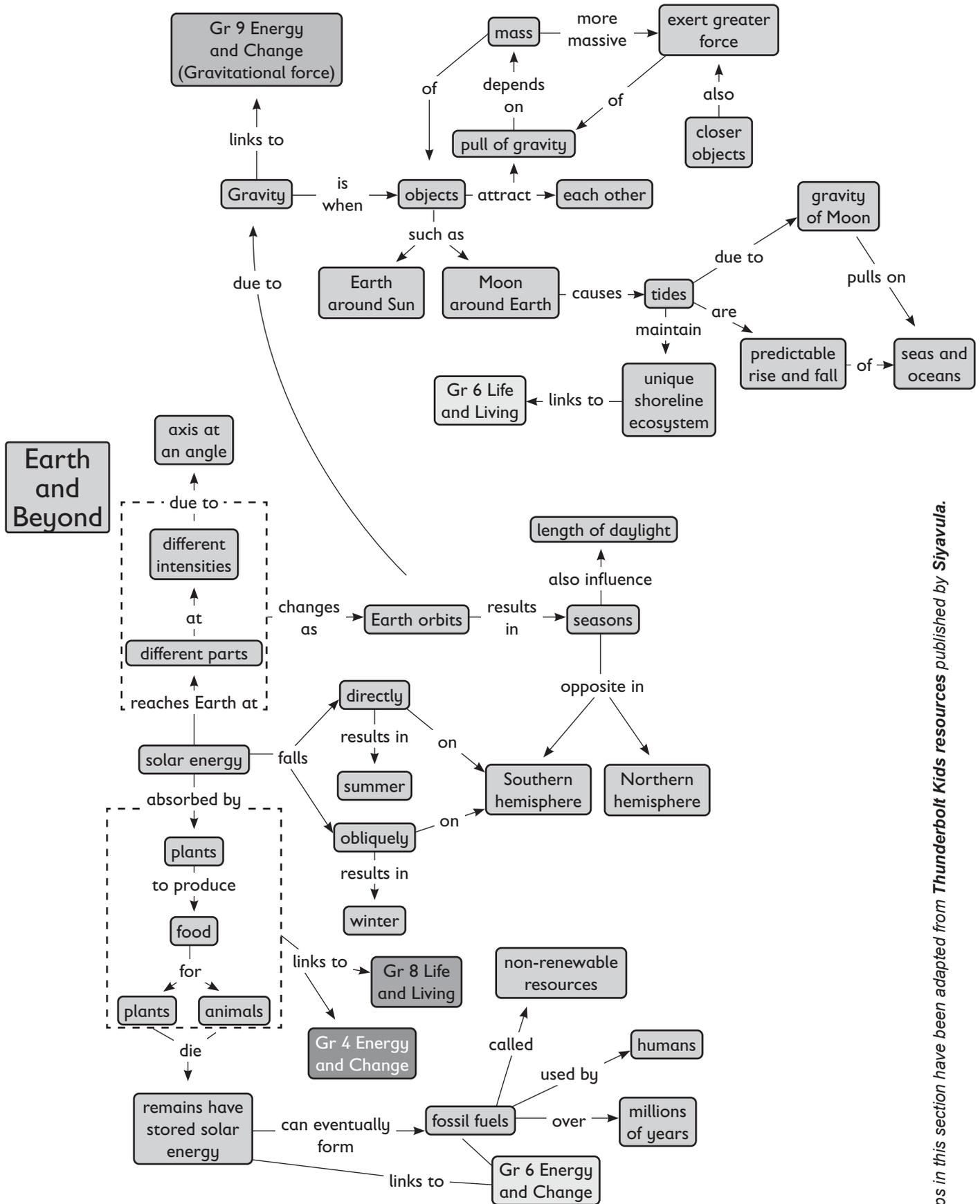
The DBE / NECT Recovery ATP Trackers Team

Overview

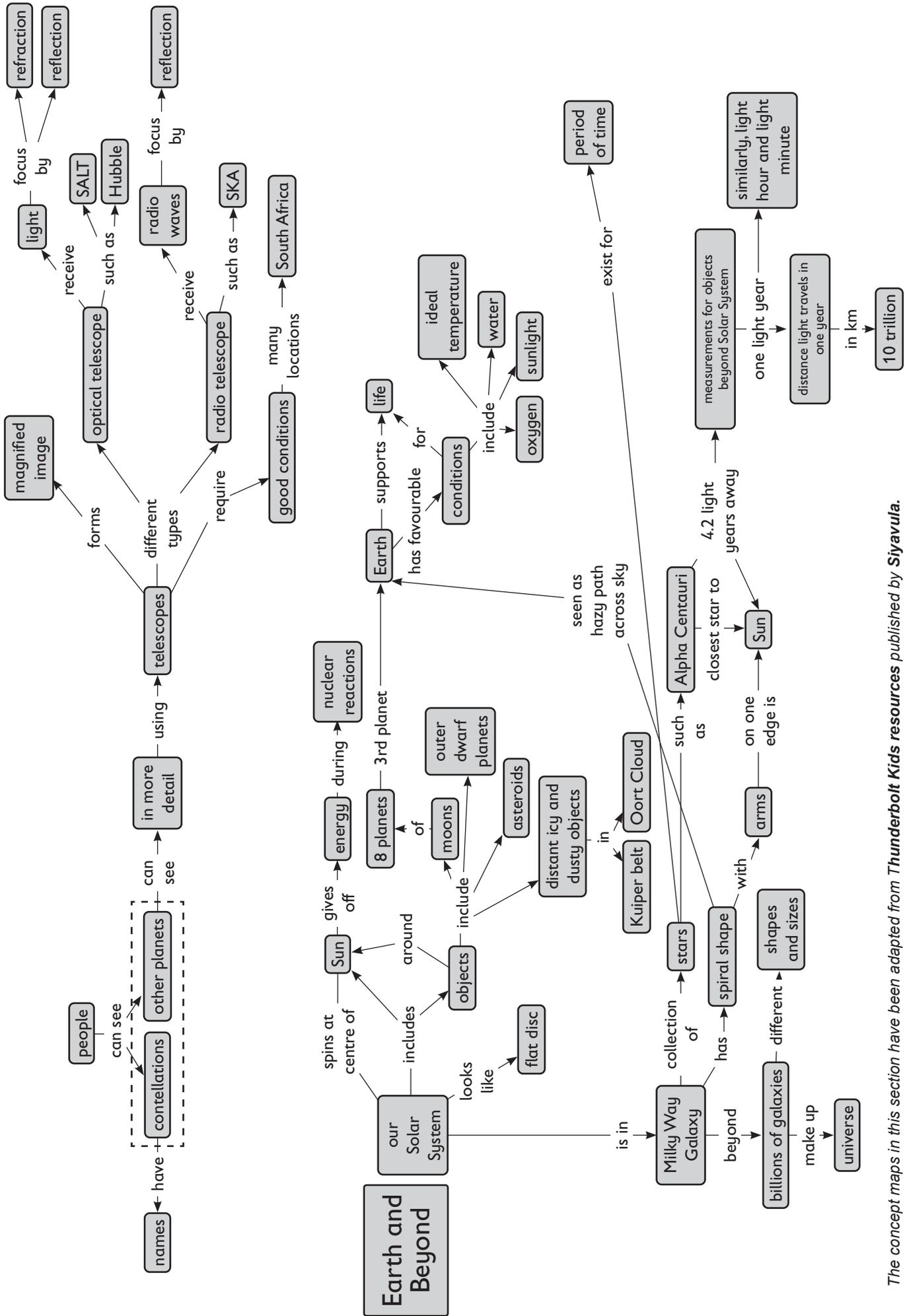
Please continue to keep the following key principles in mind throughout the recovery journey:

- 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.

Senior Phase Conceptual Chain: Grade 7



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



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Amendments to the Annual Teaching Plan

It is important to note that all the topics for Gr8 Term 4, NS, remain as per CAPS (Grade 8). Therefore, there is no change to the topics and time allocation.

- **Some topics remain the same:**

1. The Solar System (3 weeks)
2. Beyond the Solar System (3 weeks)
3. Looking into Space (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 8 are as follows:

	TERM 1	TERM 2	TERM 3	TERM 4
Practical Task/Investigation/Projects	20 marks	20 marks	30 marks	-
Test	60 marks	90 marks	60 marks	90 marks

Sample Assessment Tasks and Memoranda / Rubrics for Grade 8 Term 4 are included in this document.

Notes:

- **Column 1** shows the **time allocation** per topic.
- **Column 2** shows the **Recovery ATP requirements** for Grade 8 Term 4.
- **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 4 teaching time** for NS is **reduced**, please ensure that the **KEY CONCEPTS** listed below each table are thoroughly covered.

Key To Approved Textbook Abbreviations:

VIVA	Viva Natural Sciences Grade 8 Vivlia
PLAT	Platinum Natural Sciences Grade 8 Maskew Miller Longman
SFA	Solutions for All Natural Sciences Grade 8 MacMillan
DbD	Day by Day Natural Sciences Grade 8 Maskew Miller Longman
OX	Oxford Successful Natural Sciences Grade 8 Oxford University Press
SO	Spot On Natural Sciences Grade 8 Pearson
TC	Top Class Natural Sciences Grade 8 Shuter and Shooter
SIBB	Sasol Inzalo Bk B Natural Sciences Grade 8 Sasol
SbS	Step-by-Step Natural Sciences Grade 8 Van Schaik
VA	Via Afrika Natural Sciences Grade 8 Via Afrika

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS	DATE COMPLETED
Weeks 1, 2 & 3 9 hours	The Solar System 1. The Sun 2. Objects around the Sun 3. Earth's position in the Solar System	Gr 8 Term 4 Lesson Plans Lesson 1A: How the Sun emits light and heat energy Lesson 1B: Our Solar System Lesson 1C: Features of the terrestrial planets Lesson 2A: The gas giants Lesson 2B: Make a model of our Solar System: Part 1 Lesson 2C: Make a model of our Solar System: Part 2 Lesson 3A: Comparison between terrestrial and gas planets Lesson 3B: The Kuiper and Asteroid Belt,	SIBB Gr 8 144 – 183 VA Gr 8 146 – 159 PLAT Gr 8 192 – 209 SFA Gr 8 195 – 206 SNS Gr 8 162 – 169 SBS Gr 8 125 – 138 SO Gr 8 148 – 157 TC Gr 8 140 -146 OX Gr 8 162 - 171	

Scaling down

If the Term 4 teaching time is reduced, ensure that learners have a thorough understanding of the following key content and concepts:

The Solar System

- The structure of the Sun and the reactions that happen on the Sun.
- How the Sun emits light and heat energy.
- Identify the 8 planets in our Solar System and their positions in relation to the Sun. Know the sizes of the different planets.
- Know Earth is the 3rd planet from the Sun. Give reasons why Earth is the only planet that is known to support life.
- Identify the terrestrial and gaseous planets. Know the features of the 2 different types of planets.
- Differentiate between asteroids, meteoroids, meteors, comets, dwarf planets and meteorites.
- Describe the Kuiper belt, Oort cloud, Asteroid belt and comets. Locate them in our Solar System.

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS	DATE COMPLETED
Weeks 4, 5 & 6 9 hours	Beyond the Solar System 1. The Milky Way galaxy 2. Our nearest star 3. Light years, light hours and light minutes 4. Beyond the Milky Way galaxy	<u>Gr 8 Term 4 Lesson Plans</u> Lesson 4B: The Milky Way Lesson 4C: Drawing the Milky Way Lesson 5A: Our nearest star Lesson 5B: Light Years, light hours Lesson 5C: Making a sundial Lesson 6A: How our universe was formed Lesson 6B: Earth's place in the universe Lesson 6C: Beyond the Solar System	SO Gr 8 157 – 166 TC Gr 8 145 – 151 PLAT Gr 8 209 – 225 OX Gr 8 162 – 181 VA Gr 8 160 – 187 SIBB Gr 8 144 – 216 SBS Gr 8 136 – 147 SFA Gr 8 206 – 221	

If the Term 4 teaching time is reduced, ensure that learners have a thorough understanding of the following key concepts:

Beyond the Solar System

- Our Solar System is in the Milky Way galaxy – the Sun is our closest star in this galaxy.
- A galaxy as a collection of stars held together by gravity. There are many other galaxies in our universe.
- Explain light year, light hour, light minute. Compare distances of the planets from the Sun in light years.
- How to tell the time using a sundial.
- Differentiate between scientific and religious beliefs on how the universe was formed.

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS	DATE COMPLETED
Weeks 7 & 8 6 hours	Looking into Space 1. Early viewing of space 2. Telescopes	<u>Gr 8 Term 4 Lesson Plans</u> Lesson 7A: Constellations Lesson 7B: Telescopes and magnification Lesson 7C: Refracting telescopes Lesson 8A: Reflecting telescopes and radio Lesson 8B: SALT Lesson 8C: Summing up space	SO Gr 8 164 – 178 TC Gr 8 152 – 162 PLAT Gr8 223 – 237 OX Gr 8 182 – 192 VA Gr 8 168 – 180 SIBB Gr 8 200 – 247 SBS Gr 8 148 – 158 SFA Gr 8 222 – 239	

If the Term 4 teaching time is reduced, ensure that learners have a thorough understanding of the following key concepts:

Looking into Space

- How stars are arranged in different constellations. Names of certain constellations come from different cultures. Stories around them.
- How a telescope works. The 2 types of optical telescopes.
- How the refracting telescope works. How reflecting telescopes work.
- How radio telescopes work – gather information from radio waves.
- The importance of SALT.

Below is a sample assessment test and memorandum. Please feel free to use this test 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 8 Term 4
Test
90 marks

NOTE TO THE TEACHER:

If possible, photocopy this exam for each learner. If this is not possible, write the exam 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.

Which planet in our Solar System is closest to the Sun?

- a. Neptune
- b. Mercury
- c. Earth
- d. Saturn.

You have answered correctly if you have circled (b)

SECTION A: Energy and Change

QUESTION 1: MULTIPLE CHOICE

[6]

1a. In a series circuit, which wire is the best conductor?

- a. Steel wire
- b. Nichrome
- c. Plastic wire
- d. Lead

1b. An opaque object is ...

- a. An object that allows light to pass through it.
- b. An object that sometimes allows light to pass through it.
- c. An object that does not allow light to pass through it.
- d. An object that does not allow coloured light to pass through it.

1c. What can be used to break white light into the spectrum of colours?

- a. A circular prism.
- b. A square prism.
- c. A rectangular prism.
- d. A triangular prism.

1d. The scientific definition of friction is:

- a. When people fight.
- b. The force that resists the movement between two objects.
- c. When two objects attract each other.
- d. The force that repels the movement between two objects.

1e. When more resistors are connected in parallel what happens to the resistance in a circuit?

- a. The resistance decreases.
- b. The resistance increases.
- c. The resistance stays the same.
- d. There is no resistance.

1f. A translucent object ...

- a. Does not allow light to pass through it.
- b. Allows light to partially pass through it.
- c. Allows all light to pass through it.
- d. Only allows white light through it.

QUESTION 2: True or False

[5]

Write true or false next to the following statements:

2a. Electrons move from one object to another through friction.

2b. An electrical circuit is a system used for the transfer of heat energy.

2c. In a series circuit the strength of the current is the same everywhere.

2d. Copper has a very low resistance to electric current.

2e. The separation of charges is called current electricity.

QUESTION 3:

[6]

Write one or two words that mean the same as the sentence:

3a. Something that is not moving in an electrical charge.

3b. Very thin thread or wire in a bulb.

3c. The splitting of white light into different colours.

3d. Opposition to the flow of electrical current.

3e. A material that does not allow a charge to flow through it.

3f. To push away from something.

QUESTION 4:

[12]

Answer the questions below.

4a. Explain the difference between an open and a closed circuit. (4)

4b. How does resistance affect the flow of an electrical current in a series circuit? (4)

4c. What does LED stand for? (1)

4d. When a prism was placed on white paper and a beam of light shone through the slit in the cardboard, several colours showed up on the paper. Name these seven colours. (1)

4e. Write a definition for photoreceptors. (2)

QUESTION 5:

5a. Use the correct symbols to draw the circuit diagram from the drawing below.

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SECTION B: Planet Earth and Beyond

QUESTION 1: MULTIPLE CHOICE

[6]

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

1a. The sun releases:

- a. Light energy and heat energy.
- b. Sound energy and light energy.
- c. Heat energy and movement energy.
- d. Sound energy and movement energy.

1b. Choose the statement that is true of our Solar System.

- a. The moon is the largest object in our Solar System.
- b. Jupiter is the largest object in our Solar System.
- c. The Sun is the largest object in our Solar System.
- d. The Sun and moon are the largest objects in our Solar System.

1c. The conditions to support life are:

- a. Temperature, water, sunlight and oxygen.
- b. Water, CO₂, sunlight.
- c. Temperature, oxygen, water and chlorophyll.
- d. Oxygen, plants and chlorophyll.

1d. An astronomer is:

- a. A person that can see the future.
- b. A person who studies astrology.
- c. A scientist that tells fortunes.
- d. A scientist who studies the stars..

1e. Choose the fact that is false when describing a dwarf planet:

- a. Not able to keep their path clear of other objects.
- b. Objects that orbit the sun.
- c. Smaller than planets.
- d. Bigger than planets.

1f. The name of our galaxy is

- a. Orion
- b. Milky Way
- c. Alpha Centauri
- d. Proxima

QUESTION 2:

[5]

Write one word that means the same as the sentence:

2a. A collection of stars, space dust and gas, held together by gravity.

2b. Lumps of frozen gas.

2c. The centre of an object.

2d. Small rocky objects made of stony or metallic material.

2e. When 2 objects melt from intense heat and join together.

QUESTION 3:

[6]

3a. Draw a food chain that has a producer, a herbivore, an omnivore and a carnivore from an ecosystem. Remember to give your food chain a heading. (Remember write the words. Do not draw pictures.)

Heading: _____

QUESTION 4:

[11]

Answer the questions below.

4a. What process releases energy from the Sun's core? _____ (2)

4b. What are the differences between terrestrial planets and gas planets? (6)

Terrestrial Planets	Gas Planets

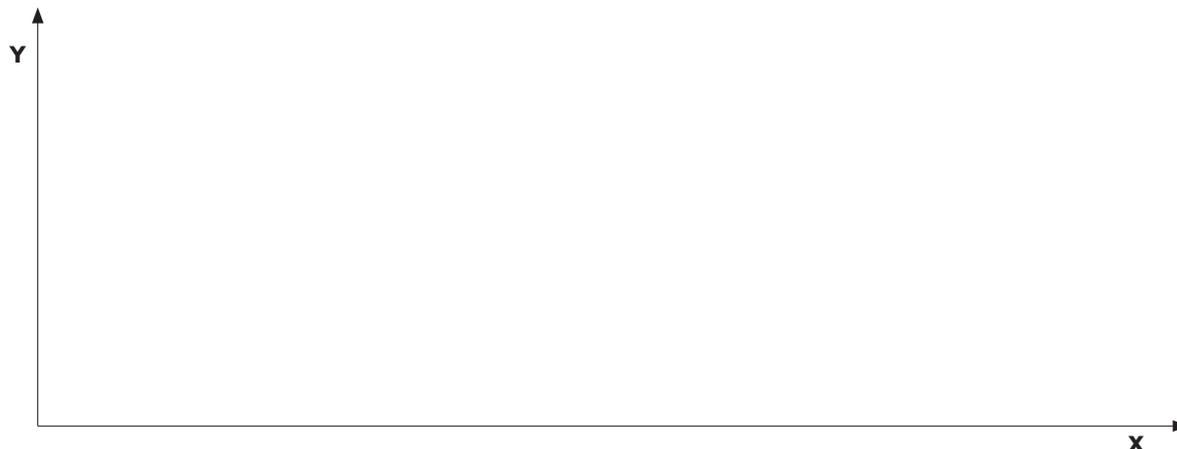
4c. Name the 3 layers of the rocky planets. (3)

QUESTION 5:

[7]

5a Use the information below to draw a bar graph to represent the planets and their number of moons.

Planet	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune
Number of moons	0	0	1	2	67	63	27	13



QUESTION 6:

[6]

Write the word or words that means the same as the sentence:

6a. The general shape of our galaxy, the Milky Way.

6b. This force that stops the stars in our galaxy from moving away from each other.

6c. The distance that light travels in one year.

Answer the questions below.

6d. Write the names of the 8 planets in order, from closest to the Sun to furthest from the Sun.

6e. Give 2 important facts about galaxies.

QUESTION 7:

[5]

Imagine that you are travelling through space in a spaceship. You are looking for a planet where life could exist.

7a. What would the planet need to have for people to live on it?

Name 3 things.

7b. If you saw a planet that looked red, which planet would it be?

7c. Why does it look red?

QUESTION 8:

[9]

Complete the sentences. Fill in the correct answers:

8a. The 3 constellations that we can see in the Southern Hemisphere are: the Southern Cross.

_____ and _____

8b. The inventor of the very first telescope was _____.

8c. The radio telescope, SKA, stands for _____

Answer these questions.

8d. How do telescopes help us to see things that are very far away?

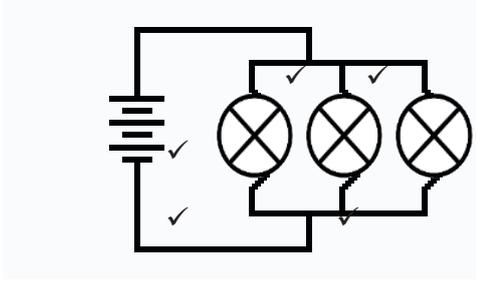
8e. Explain the difference between an Optical telescope and a Radio telescope.

8f. Explain how a reflecting telescope works.

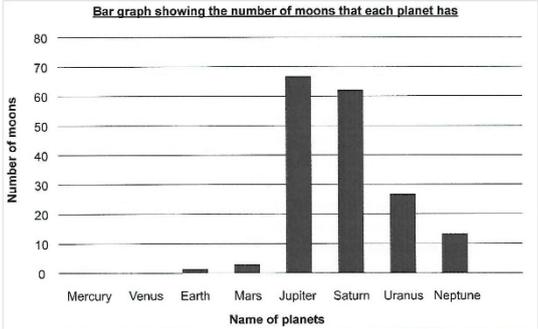
TOTAL: 90

Grade 8 Natural Sciences Term 4 Test Memorandum			
CAPS Topic	Questions	Expected answer(s)	Marks
PART A: Energy and Change			
	1		
Series and parallel circuits	1a	B ✓	1
Visible light	1b	C ✓	1
Visible light	1c	D ✓	1
Static electricity	1d	B ✓	1
Series and parallel circuits	1e	A ✓	1
Visible light	1f	B ✓	1
	2		
Static electricity	2a	True ✓	1
Energy transfer	2b	False ✓	1
Series and parallel circuits	2c	True ✓	1
Series and parallel circuits	2d	True ✓	1
Static electricity	2e	False ✓	1
	3		
Static electricity	3a	Static ✓	1
Energy transfer	3b	Filament ✓	1
Visible light	3c	Dispersion ✓	1
Series and parallel circuits	3d	Resistance ✓	1
Static electricity	3e	Isolator ✓	1
Static electricity	3f	Repel ✓	1
	4		
Energy transfer	4a	A closed circuit allows electricity to pass through and an open circuit does not allow electricity to pass through. ✓ ✓ ✓ ✓	4
Energy transfer	4b	The higher the resistance, the lower the current and the lower the resistance, the higher the current. ✓ ✓ ✓	4
Series and parallel	4c	Light-emitting diode ✓	1

Grade 8 Natural Sciences Assessment - Exam Term 4 Memo

Visible light	4d	Violet, indigo, blue, green, yellow, orange and red ✓	1
Visible light	4e	Cells in the eye that are sensitive to light ✓ ✓	2
5			
Series and parallel	5a		6
PART B: Earth and Beyond			
1			
The Solar System	1a	A ✓	1
The Solar System	1b	C ✓	1
The Solar System	1c	A ✓	1
Beyond the Solar System	1d	D ✓	1
The Solar System	1e	D ✓	1
Beyond the Solar System	1f	B ✓	1
2			
The Solar System	2a	Galaxy ✓	1
The Solar System	2b	Comets ✓	1
The Solar System	2c	Core ✓	1
The Solar System	2d	Asteroids ✓	1
The Solar System	2e	Fusion ✓	1
3			
The Solar System	3a	Accept different answers for any ecosystem: <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> eg: Grass ✓ → butterfly ✓ → bird ✓ → fox ✓ <u>Food chain from a Savannah</u> ✓ (plus one mark for arrows) ✓ </div>	6
4			
The Solar System	4a	Nuclear fusion ✓ ✓	2
The Solar System	4b	Terrestrial planets – metal core, rocky mantle, thin outer crust, thin atmosphere ✓ ✓ ✓ Gas planets – Mostly made of hydrogen and helium, less dense than rocky planets. ✓ ✓ ✓	6
The Solar System	4c	Core, mantle and crust ✓ ✓ ✓	3

Grade 8 Natural Sciences Assessment - Exam Term 4 Memo

	5																				
The Solar System		<div style="text-align: center;">  <p style="font-size: small;">Bar graph showing the number of moons that each planet has</p> <table border="1" style="font-size: x-small; margin: 0 auto;"> <thead> <tr> <th>Planet</th> <th>Number of Moons</th> </tr> </thead> <tbody> <tr><td>Mercury</td><td>0</td></tr> <tr><td>Venus</td><td>0</td></tr> <tr><td>Earth</td><td>1</td></tr> <tr><td>Mars</td><td>2</td></tr> <tr><td>Jupiter</td><td>67</td></tr> <tr><td>Saturn</td><td>63</td></tr> <tr><td>Uranus</td><td>27</td></tr> <tr><td>Neptune</td><td>14</td></tr> </tbody> </table> </div> <p>Award marks as follows:</p> <p>Heading ✓</p> <p>labelling of x-axis ✓</p> <p>labelling of y-axis ✓</p> <p>accuracy of graph ✓ ✓ ✓ ✓</p>	Planet	Number of Moons	Mercury	0	Venus	0	Earth	1	Mars	2	Jupiter	67	Saturn	63	Uranus	27	Neptune	14	7
Planet	Number of Moons																				
Mercury	0																				
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Mars	2																				
Jupiter	67																				
Saturn	63																				
Uranus	27																				
Neptune	14																				
	6																				
Beyond the Solar System	6a	spiral ✓	6																		
Beyond the Solar System	6b	gravity ✓																			
Beyond the Solar System	6c	light year ✓																			
Beyond the Solar System	6d	Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune ✓																			
Beyond the Solar System	6e	<p>Any 2 facts from below ✓ ✓</p> <ul style="list-style-type: none"> • There are about 100 to 200 billion galaxies • Galaxies contain millions or billions of stars • Galaxies contain large amounts of gas and dust • The galaxies are all moving at great speeds so the universe keeps getting bigger 																			
	7																				
Beyond the Solar System	7a	<ul style="list-style-type: none"> • Any 3 from the list below: ✓ ✓ ✓ • Oxygen, sunlight, water and the correct temperature 	5																		
	7b	<ul style="list-style-type: none"> • Mars ✓ 																			
	7c	<ul style="list-style-type: none"> • it has iron in its soil and strong winds blow this red soil into the atmosphere. ✓ 																			

Grade 8 Natural Sciences Assessment - Exam Term 4 Memo

	8		
Beyond the Solar System	8a	Orion ✓ and Pavo the peacock ✓✓	2
Beyond the Solar System	8b	Galileo Galilei ✓	1
Beyond the Solar System	8c	Square Kilometre Array ✓	1
Beyond the Solar System	8d	They magnify the size of a far away object many, many times so that we can see it ✓	1
Beyond the Solar System	8e	<ul style="list-style-type: none"> • Optical telescopes receive light and focus the light by refraction or reflection ✓ • Radio telescopes receive radio waves and focus them by reflection ✓ 	2
	8f	<ul style="list-style-type: none"> • Reflecting telescopes use a curved, primary mirror ✓ to collect light from distant objects and reflect it to a focus. ✓ 	2
TOTAL: 90			