"Nothing in life is to be feared. It is only to be understood. Now is the time to understand more, so that we may fear less."

– **Marie Curie**

NATURAL SCIENCES & TECHNOLOGY

LESSON PLAN
GRADE 4 TERM 4

A MESSAGE FROM THE NECT

NATIONAL EDUCATION COLLABORATION TRUST (NECT)

Dear Teachers,

This learning programme and training is provided by the National Education Collaboration Trust (NECT) on behalf of the Department of Basic Education (DBE)! We hope that this programme provides you with additional skills, methodologies and content knowledge that you can use to teach your learners more effectively.

What is NECT?

In 2012 our government launched the National Development Plan (NDP) as a way to eliminate poverty and reduce inequality by the year 2030. Improving education is an important goal in the NDP which states that 90% of learners will pass Maths, Science and languages with at least 50% by 2030. This is a very ambitious goal for the DBE to achieve on its own, so the NECT was established in 2015 to assist in improving education and to help the DBE reach the NDP goals.

The NECT has successfully brought together groups of relevant people so that we can work collaboratively to improve education. These groups include the teacher unions, businesses, religious groups, trusts, foundations and NGOs.

What are the Learning programmes?

One of the programmes that the NECT implements on behalf of the DBE is the 'District Development Programme'. This programme works directly with district officials, principals, teachers, parents and learners; you are all part of this programme!

The programme began in 2015 with a small group of schools called the Fresh Start Schools (FSS). Curriculum learning programmes were developed for Maths, Science and Language teachers in FSS who received training and support on their implementation. The FSS teachers remain part of the programme, and we encourage them to mentor and share their experience with other teachers.

The FSS helped the DBE trial the NECT learning programmes so that they could be improved and used by many more teachers. NECT has already begun this embedding process.

Everyone using the learning programmes comes from one of these groups; but you are now brought together in the spirit of collaboration that defines the manner in which the NECT works. Teachers with more experience using the learning programmes will deepen their knowledge and understanding, while some teachers will be experiencing the learning programmes for the first time.

Let's work together constructively in the spirit of collaboration so that we can help South Africa eliminate poverty and improve education!

www.nect.org.za

CONTENTS

PROGRAMME ORIENTATION

Welcome to the NECT Natural Sciences & Technology learning programme! This CAPS compliant programme consists of:

- A full set of lesson plans for the term (3 lessons per week)
- A resource pack with images to support the lesson plans
- A full colour poster for one topic
- An outline of the assessment requirements for the term
- A tracker to help you monitor your progress

Lesson Plan Structure

1. The Term 4 lesson plan is structured to run for 8 weeks.
2. Each week, there are three lessons, of the following notional time:

   1 x 1 hour 30 minutes

   2 x 1 hour

   This time allocation of 3.5 hours per week is CAPS aligned.

Lesson Plan Contents

1. The lesson plan starts with a **CONTENTS PAGE** that lists all the topics for the term, together with a breakdown of the lessons for that topic. You will notice that lessons are named by the week and lesson number, for example, Week 8 Lesson 8C.

2. Every topic begins with a 2 - 4 page **TOPIC OVERVIEW**. The topic overview pages are grey, making them easy to identify. The topic overview can be used to introduce the topic to learners. The topic overview includes:

   a. A ***general introduction*** to the topic that states how long the topic runs for, the value of the topic in the final exam and the number of lessons in the topic.

   b. A table showing the ***position of the topic*** in the term.

   c. A ***sequential table*** that shows the prior knowledge required for this topic, the current knowledge and skills that will be covered, and how this topic will be built on in future years. Use this table to give learners an informal quiz to test their prior knowledge. If learners are clearly lacking in the knowledge and skills required, you may need to take a lesson to cover some of the essential content and skills. It is also useful to see what you are preparing learners for next, by closely examining the 'looking forward' column.

   d. A glossary of ***scientific and technological vocabulary***, together with an explanation of each word or phrase. It is a good idea to display these words and their definitions somewhere in the classroom, for the duration of the topic. It is also a good idea to allow learners some time to copy down these words into their personal dictionaries or science exercise books. You must explicitly teach the words and their meanings as and when you encounter these words in the topic. A good way to teach learners new vocabulary is to use 'PATS':

- POINT – if the word is a noun, point at the object or at a picture of the object as you say the word.
- ACT – if the word is a verb, try to act out or gesture to explain the meaning of the word, as you say it.
- TELL – if the word has a more abstract meaning, then tell the learners the meaning of the word. You may need to code switch at this point, but also try to provide a simple English explanation.
- SAY – say the word in a sentence to reinforce the meaning.

e. ***Understanding the uses / value of natural sciences & technology****.* 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 the topic, and invite learners to elaborate on the uses and value that this topic will have to their lives.

f. ***Personal reflection****.* At the end of every topic, come back to the topic overview, and complete this table. In particular, it is important to note your challenges and ideas for future improvement, so that you can improve your teaching the next year.

3. After the topic overview, you will find the **INDIVIDUAL LESSONS.** Every lesson is structured in exactly the same way. This helps you and the learners to anticipate what is coming next, so that you can focus on the content and skills. Together with the title, each lesson plan includes the following:

a. ***Policy and Outcomes****.* This provides you with the CAPS reference, and an overview of the skills that will be covered in the lesson. You can immediately see the SCIENCE PROCESS AND DESIGN SKILLS that will be covered, and whether they are lower or higher order skills.

b. ***Possible Resources****.* Here, you will see the resources that you should ideally have for the lesson. If you need to use the poster or pages from the resource pack, this will be listed here. There is also a space for improvised resources, and you are invited to add your own ideas here.

c. ***Classroom Management****.* Every lesson starts in the same way. Before the lesson, you must write a question that relates to the previous lesson on the chalkboard. Train your learners to come in to the classroom, to take out their exercise books, and to immediately try to answer this question. This links your lesson to the previous lesson, and it effectively settles your learners.

Once learners have had a few minutes to answer, read the question and discuss the answer. You may want to offer a small reward to the learner who answers first, or best. Get your learners used to this routine.

Next, make sure that you are ready to begin your lesson, have all your resources ready, have notes written up on the chalkboard, and be fully prepared to start. Remember, learners will get restless and misbehave if you do not keep them busy and focussed.

d. ***Accessing Information****.* This section contains the key content that you need to share with learners. Generally, it involves sharing some new information that is written on the chalkboard, explaining this information, and allowing learners some time to copy the information into their exercise books. Train learners to do this quickly and efficiently. Learners must anticipate this part of the lesson, and must have their books, pens, pencils and rulers ready.

Explain to learners that this is an important resource for them, because these are the notes they will revise when preparing for tests and exams.

Checkpoint 1*.* Straight after 'Accessing Information', you will find two checkpoint questions. These questions help you to check that learners understand the new content thus far.

e. ***Conceptual Development****.* At this point, learners will have to complete an activity to think about and apply their new knowledge, or to learn a new skill. This is the most challenging part of the lesson. Make sure that you fully understand what is required, and give learners clear instructions.

Checkpoint 2*.* Straight after 'Conceptual Development, you will find two checkpoint questions. These questions help you to check that learners understand the new concepts and skills that they have engaged with.

f. ***Reference Points for Further Development****.* This is a useful table that lists the relevant sections in each approved textbook. You may choose to do a textbook activity with learners in addition to the lesson plan activity, or even in place of the lesson plan activity. You may also want to give learners an additional activity to do for homework.

g. ***Additional Activities / Reading****.* This is the final section of the lesson plan. This section provides you with web links related to the topic. Try to get into the habit of visiting these links as part of your lesson preparation. As a teacher, it is always a good idea to be more informed than your learners.

4. At the end of the week, make sure that you turn to the **TRACKER,** and make note of your progress. This helps you to monitor your pacing and curriculum coverage. If you fall behind, make a plan to catch up.

5. **POSTER AND RESOURCE PACK.** You will have seen that the *Possible Resource* section in the lesson plan will let you know which poster or reference pages you will need to use in a lesson.

   Please note that you will only be given these resources once. It is important for you to manage and store these resources properly. Do this by:

   - Writing your name on all resources
   - Sticking Resource onto cardboard or paper
   - Laminating all resources, or covering them in contact paper
   - Filing the resource papers in plastic sleeves once you have completed a topic

   Have a dedicated wall or notice board in your classroom for Natural Science and Technology.

   - Use this space to display the resources for the topic
   - Display the vocabulary words and meaning here, as well as the resources
   - Try to make this an attractive and interesting space
   - Display learners' work on this wall – this gives learners a sense of ownership and pride

6. **ASSESSMENT.** At the end of the lesson plans, you will find the CAPS assessment requirements for the term. You should refer to your prescribed textbooks and departmental resources for examples of the relevant assessments.

Lesson Plan Routine

Train your learners to know and anticipate the routine of Natural Science and Technology lessons. You will soon see that a good knowledge of this routine will improve time-on-task and general classroom discipline and that you will manage to work at a quicker pace.

Remember, every Natural Science and Technology lesson follows this routine:

1. **Classroom Management**: settle learners by having two questions written on the chalkboard. Learners take out their exercise books and pens, and immediately answer the questions. Discuss the answers to the questions, and reward the successful learner.
2. **Accessing Information:** have key information written on the chalkboard. Explain this to learners. Allow learners to copy this information into their books.
3. **Checkpoint 1:** ask learners two questions to check their understanding.
4. **Conceptual Development:** complete an activity to apply new knowledge or skills.
5. **Checkpoint 2:** ask learners two questions to check their understanding.
6. **Reference Points for Further Development:** links to textbook activities – you may choose to use these activities as additional classwork activities, or as homework activities.
7. **Tracker:** fill in your tracker at the end of the week to track your progress.

PROGRAMME ORIENTATION

A vehicle to implement CAPS

Teaching Natural Sciences & Technology can be exciting and rewarding. These lesson plans have been designed to guide you to implement the CAPS policy in a way that makes the teaching and learning experience rewarding for both the teacher and the learners.

To support the policy's fundamentals of teaching Natural Sciences & Technology, these lesson plans use the CAPS content as a basis and:

- provide a variety of teaching techniques and approaches
- promote enjoyment and curiosity
- highlight the relationship between Natural Science and Technology and other subjects
- where appropriate, draw on and emphasise cultural contexts and indigenous knowledge systems
- show the relationship between science, learners, their societies and their environments
- aim to prepare learners for economic activity and self-expression

Content and Time Allocation

These lessons plans have been developed to comply with CAPS in respect of both content and time allocation. In developing these lesson plans, we took into consideration the realities of teachers and to this end, we made some simple adjustments, without deviating from policy, to make the teaching of these lesson plans more achievable. The kinds of adjustments made include using some of the practical tasks in the lesson plans for assessment purposes; and building in time for revision and exams during terms 2 and 4.

CAPS assigns one knowledge strand to form the basis of content in each term. These strands are as follows:

- Term 1: ***Life and Living***
- Term 2: ***Matter and Materials***
- Term 3: ***Energy and Change***
- Term 4: ***Planet Earth and Beyond***

In most terms, there are Technology knowledge strands that complement the Natural Sciences strands. There are three Technology strands, they are:

- ***Structures***
- ***Systems and Control***
- ***Processing***

The distribution of these strands across the year is summarised in the table below:

Grade 4							
Term 1		**Term 2**		**Term 3**		**Term 4**	
Strands NS & Tech		**Strands NS & Tech**		**Strands NS & Tech**		**Strands NS & Tech**	
Life and Living	**Structures**	**Matter and Materials**	**Structures**	**Energy and Change**	**Systems and Control**	**Planet Earth and Beyond**	**Systems and Control**
Living and non-living things Structures of plants and animals What plants need to grow Habitats of animals	Structures for animal shelters	Materials around us Solid materials	Strengthening materials Strong frame structures	Energy and Energy transfer Energy around us Energy and sound	Movement energy in a system	Planet Earth The Sun The Earth & the Sun The Moon	Rocket Systems
These lesson plans have been designed against the stipulated CAPS requirements with topics being allocated for the time prescribed by CAPS. (Remember that some slight changes have been incorporated to accommodate time for revision, tests and examinations).							

PROGRAMME ORIENTATION

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The time allocation by topic is summarised in the table below.

Remember that one week equates to 3,5 hours or three lessons: two lessons of 1 hour each; and one lesson of 1½ hours.

	GRADE 4		GRADE 5		GRADE 4	
TERM	**Topic**	**Time in weeks**	**Topic**	**Time in weeks**	**Topic**	**Time in weeks**
Term 1: Life and Living	• Living and non-living things • Structures of plants and animals • What plants need to grow • Habitats of animals • Structures for animal shelters	2 2½ 1 1 2½ (10 wks)	• Plants and animals on Earth • Animal Skeletons • Food Chains • Life cycles • Skeletons and Structures	2½ 1½ 2½ 1½ 2 (10 wks)	• Photosynthesis • Nutrients in Food • Nutrition • Food Processing • Eco Systems and food webs	2½ 1½ 1½ 2½ 2 (10 wks)
Term 2: Matter and Materials	• Materials around us • Solid materials • Strengthening materials • Strong frame structures	3½ 2 2 2½ (10 wks)	• Metals and non-metals • Uses of metals • Processing materials • Processed materials	2 2½ 3½ 2 (10 wks)	• Solids, liquids and gases • Mixtures • Solutions as special mixtures • Dissolving • Mixtures and water resources • Processes to purify water	½ 1 2½ 1 2½ 2½ (10 wks)

Term 3: Energy and Change	• Energy and Energy transfer • Energy around us • Movement energy in a system • Energy and sound	2½ 2½ 2½ 2½ (10 wks)	• Stored energy in fuels • Energy and electricity • Energy and movement • Systems for moving things	3 3 1 3 (10 wks)	• Electric circuits • Electrical conductors and insulators • Systems to solve problems • Mains electricity	2½ 2 2½ 3 (10 wks)
Term 4: Planet Earth and Beyond	• Planet Earth • The Sun • The Earth & the Sun • The Moon • Rocket Systems	2 1 1 2 2 (8 wks)	• Planet Earth • Surface of the Earth • Sedimentary Rocks • Fossils	1 2½ 2 2½ (8 wks)	• The solar system • Movements of the earth and planets • The movement of the Moon • Systems looking into space • Systems to explore the Moon and Mars	2½ 1 1 1 2½ (8 wks)
TOTALS	38 weeks		38 weeks		38 weeks	

REFLECTING ON THE LESSONS THAT YOU TEACH

It is important to reflect on your teaching. Through reflection, we become aware of what is working and what is not, what we need to change and what we do not. Reflecting on your use of these lesson plans will also help you use them more effectively and efficiently.

These lesson plans have been designed to help you deliver the content and skills associated with CAPS. For this reason, it is very important that you stick to the format and flow of the lessons. CAPS requires a lot of content and skills to be covered – this makes preparation and following the lesson structure very important.

Use the tool below to help you reflect on the lessons that you teach. You do not need to use this for every lesson that you each – but it is a good idea to use it a few times when you start to use these lessons. This way, you can make sure that you are on track and that you and your learners are getting the most out of the lessons.

LESSON REFLECTION TOOL			
Preparation			
1.	What preparation was done?		
2.	Was preparation sufficient?		
3.	What could have been done better?		
4.	Were all of the necessary resources available?		
Classroom Management			
		Yes	**No**
5.	Was there a question written in the board?		
6.	Was there an answer written on the board?		
7.	Was the answer discussed with the learners in a meaningful way?		
8.	Overall reflection on this part of the lesson: What was done well? What could have been done better?		

Accessing Information			
		Yes	**No**
9.	Was the text and/ or diagrams written on the chalkboard before the lesson started?		
10.	Was the work on the board neat and easy for the learners to read?		
11.	Was the explanation on the content easy to follow?		
12.	Was the information on the board used effectively to help with the explanations?		
13.	Was any new vocabulary taught effectively? (in context and using strategies like PATS)		
14.	Were the learners actively engaged? (asked questions, asked for their opinions and to give ideas or suggestions)		
15.	Were the checklist questions used effectively?		
16.	Overall reflection on this part of the lesson: What was done well? What could have been done better?		

Conceptual Development			
		Yes	**No**
17.	Was the information taught in the 'Accessing Information' part of the lesson used to foreground the activity?		
18.	Were clear instructions given for the conceptual development activity?		
19.	Were the outcomes/answers to the activities explained to the learners?		
20.	Could the learners ask questions and were explanations given?		
21.	Was a model answer supplied to the learners? (written or drawn on the board)		
21.	Were the checklist questions used effectively?		
22.	At the end of the lesson, were the learners asked if they had questions or if they needed any explanations?		
23.	Overall reflection on this part of the lesson: What was done well? What could have been done better?		

TOPIC OVERVIEW:
Planet Earth
Term 4, Weeks 1A – 2C

A. TOPIC OVERVIEW

TERM 4, WEEKS 1A – 2C

- This topic runs for 2 weeks.
- 10% in the end of year final exam (TBC).
- It is presented over 6 lessons.
- This topic's position in the term is as follows:

LESSON	WEEK 1			WEEK 2			WEEK 3			WEEK 4			WEEK 5		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

LESSON	WEEK 6			WEEK 7			WEEK 8			WEEK 9			WEEK 10		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

B. SEQUENTIAL TABLE

GRADE 3 & Foundation Phase	GRADE 4	GRADE 5 & 6
LOOKING BACK	**CURRENT**	**LOOKING FORWARD**
• Earth from Space – What it looks like (land, oceans, clouds)	• What does the Earth look like? • What features are on the Earth? • Identify continents and oceans	• Rocks – the surface of the earth is called the crust and is made up of rocks (even under the oceans) and soil.

C. SCIENTIFIC AND TECHNOLOGICAL VOCABULARY

Ensure that you teach the following vocabulary at the appropriate place in the topic:

	TERM	EXPLANATION
1.	sphere	a round shape like a ball.
2.	surface	the outside part or top layer of something. The part of the Earth that we live on is called the Earth's surface.
3.	feature	an interesting part of something. Something that stands out.

4.	oceans	very large bodies of salty water on the Earth. Oceans are usually found between continents.
5.	seas	large bodies of salty water on the Earth. These are not as big as oceans.
6.	lake	a large body of water surrounded by land. They are not as big as an ocean or a sea.
7.	continent	a large piece of land on the Earth's surface. There are seven continents all together. Africa is one of the seven continents.
8.	island	a smaller piece of land surrounded by water.
9.	atmosphere	the layer of air that surrounds the Earth.
10.	habitat	the place where animals and plants live. This is because the environment is right for them.

D. UNDERSTANDING THE USES / VALUE OF SCIENCE

This topic will teach the learners about the planet they live on, and how it is viewed from space. The learners will learn about land features and how they influence the use of the land.

E. PERSONAL REFLECTION

Reflect on your teaching at the end of each topic:

Date completed:	
Lesson successes:	
Lesson challenges:	
Notes for future improvement:	

1 A

Term 4, Week 1, Lesson A
Lesson Title: Features of the Earth
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Features of the Earth
CAPS Page Number	27

Lesson Objectives

By the end of the lesson, learners will be able to:

- identify the main features of planet Earth
- identify the main features on the surface of the Earth
- recognise that the Earth's surface has land masses (continents and islands) and water masses (oceans & seas)

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	
2. Observing		8. Predicting	✓	14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 1 and 2	
A globe	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

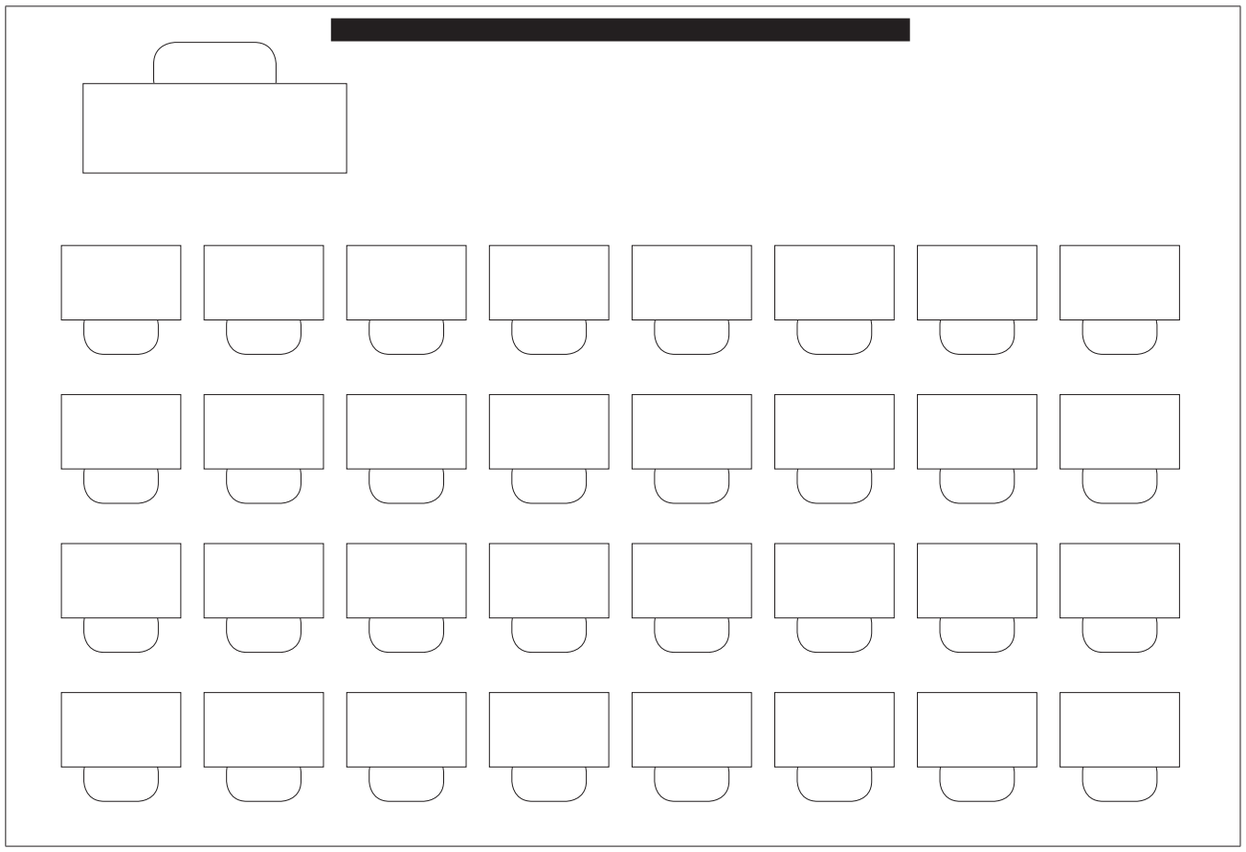
> Think about your journey to school this morning. On your way to school today, what land marks or features did you see. Think of big things like trees, buildings, rivers, bridges and mountains.
>
> Write down three of these things that you noticed.

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *Some of you will have seen mountains or hills, some of you will have only seen flat land. Some of you might have crossed a river. These are all examples of features of the Earth. Other features of the Earth that exist are oceans and seas, lakes and beaches.*

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts): or copied material / notes



2. Explain the following to the learners:

   a. This picture is an example of what a fly on the roof of the classroom will see if it looks down. There are desks and chairs for the learners and a desk and a chair for the teacher, and it might see the top of the board.

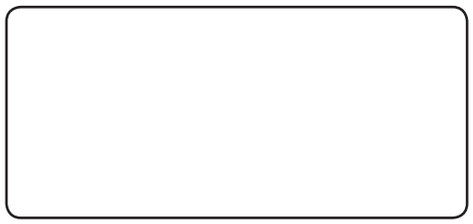
   b. We need to learn what something looks like from above. The fly will only be able to see the tops of the surfaces in the classroom.

   c. We need to understand that things can be seen in different ways. Sometimes things are seen from above, just like the fly was looking down on our classroom. When you are looking at things from above, it is called a Bird's Eye View. (What will a bird see while flying over?)

2. Show the learners the picture of the Earth on Resource 1. Tell them that this is a Bird's Eye View of Earth.

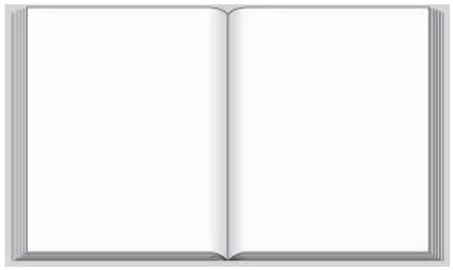
3. Tell the learners to draw Bird's Eye View of their desk. Remind them that their books and pencils are features on the desk.

Example:



Desk

Pencils



Book

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What do we call the view of something from above?
b. What is a feature of the earth?

Answers to the checkpoint questions are as follows:

a. A Bird's Eye View.
b. A feature is a part of the earth that s clearly visible.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard:

PLANET EARTH

1. The Earth is our home. Earth is a very special planet, that is why we can live on it.
2. It contains large pieces of land that are called continents, and smaller pieces of land that are called islands.
3. It also has large areas of water that are called oceans, and smaller areas called seas.
4. There are rivers and lakes that contain water on the land.
5. Water in the oceans and seas is salt-water, and in lakes and rivers is freshwater, although sometimes you can find a salt-water lake.

2. Read the information on the board to the learners.

3. Show and discuss Resource 1 and 2 with the learners.
4. Read through the facts with the learners.
5. After looking at the pictures on Resource 1 and 2, tell the learners to copy these questions down in their book and answer them:

PLANET EARTH

1. Make a list of the main features of the Earth that you can see from resource 1 and 2.
2. Name two kinds of water and say which kind we use more of everyday?
3. If you joined all the oceans up and all the land up on the Earth, which one would be bigger?
4. Why do you think the Earth is sometimes called the 'Blue Planet'?

6. Give learners some time to complete this task in their exercise books.

Model Answer:

1. *Mountains, hills, valleys, rivers, lakes, oceans, seas, beaches.*
2. *Freshwater and Saltwater. We use freshwater every day. You cannot drink salt water.*
3. *All of the oceans joined together would be bigger.*
4. *The Earth is sometimes called the 'Blue Planet' because it looks mostly blue when seen from space.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Can you name all of the planets?
b. Which star in the Solar System produces heat and light?

Answers to the checkpoint questions are as follows:

a. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune
b. The Sun

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	The Features of the Earth	193
Study & Master	Planet Earth	132
Day by Day	Features of the Earth	137
Platinum	Planet Earth	153
Viva	Planet Earth – an Introduction	125
Oxford Successful	Features of the Earth	112
Shuter & Shooter	Planet Earth	112
Sasol Inzalo Bk B	Planet Earth	82
Spot On	Earth	84

E ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=BsqKTJtK_vw (9 mins) [Exploring Landforms and Bodies of Water for Kids]

1 B

Term 4, Week 1, Lesson B
Lesson Title: Features of the Earth
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Atmosphere and Habitats
CAPS Page Number	27

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain what the atmosphere of the Earth is
- describe the main differences between the various habitats

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting	✓	14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 2	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> In what feature, on the surface of the Earth, do fish live in?

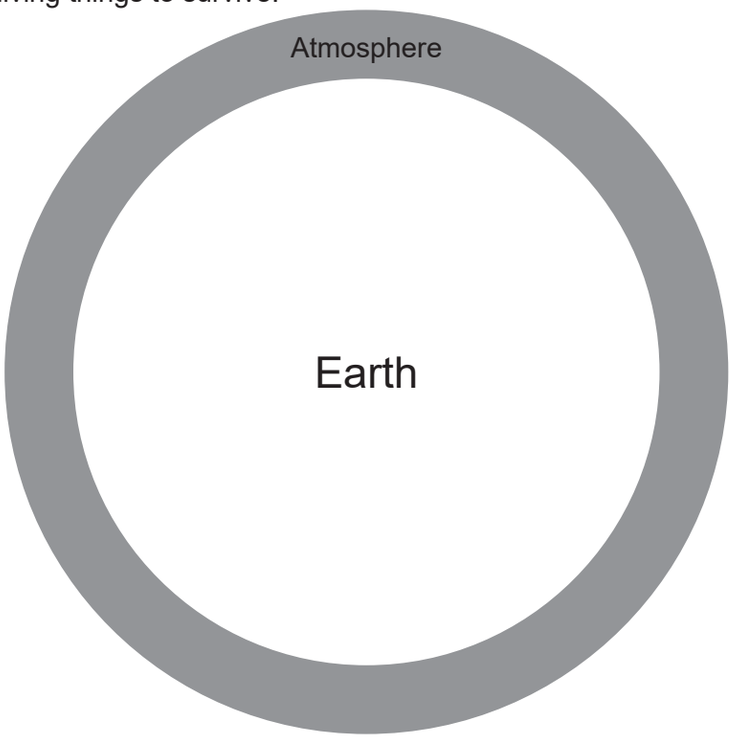
3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *In the rivers, lakes, seas and oceans*

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

The Earth has a layer of air around it called the atmosphere. This air has oxygen in it, which people need to be able to breathe. Without this air, no animal or plant would be able to stay alive. Air is all around you. The atmosphere also acts like a blanket keeping the Earth's surface warm enough for living things to survive.



2. Explain this to the learners as follows:
    a. The air that we breath is all around us. It is under the tables, it is up in the roof, there is air up in the clouds.
    b. The air around us is what people, plants and animals need to stay alive.
3. Ask the learners to copy the above information and to draw the picture of the Earth and the atmosphere into their workbooks.
4. Give learners some time to copy this information into their exercise books.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What is the layer of air around the Earth called?
b. Why is this layer of air important for people?

Answers to the checkpoint questions are as follows:

a. This layer is called the atmosphere.
b. This layer of air is important because it contains oxygen that we need to breath.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard:

Plants, people and animals all have special places where they live on Earth. These are called habitats. Different physical features on the Earth mean that there are different habitats. Every living thing has a special job to do in nature, so it is important that there is a habitat for them to live in. Animals choose their habitats carefully so that they can always find food and provide safety and shelter for themselves and their young.

2. Read the information on the board to the learners.
3. Show the learners Resource 2.
4. Discuss which animals might live in the scene shown in each picture.
5. After looking at the pictures on Resource 2, tell the learners to copy these questions down in their book and answer them:

HABITATS

1. What is a habitat?
2. Name four types of habitats you have seen in the pictures.
3. What do you think will happen if people damage a habitat?

Model Answer:

A habitat is the home of an animal or plant.

Rivers, seas, grasslands, forests, mountains.

If people damage a habitat, the plants will not be able to grow, and the animals that eat those plants will not have food, and will not survive.

6. If there is time, ask the learners to draw a picture of a habitat of their choice in their workbooks. The learners should label the main features of the habitat, and at least one plant and one animal that live in the habitat.
7. Give learners some time to complete this task in their workbooks.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

c. What would the features be of a desert habitat?
d. What do living things need to survive?

Answers to the checkpoint questions are as follows:

a. There is not much water in a desert habitat, so it will have plants and animals that can survive with hardly any water.
b. Water, food and air.

8. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Planet Earth and Beyond	198
Study & Master	Layer of air around the Earth	141
Day by Day	There is a thin layer of air surrounding the Earth	141
Platinum	Earth has a thin layer of air around it	158
Viva	The Atmosphere	129
Oxford Successful	Features of the Earth	114
Shuter & Shooter	Habitats of the Earth	115
Sasol Inzalo Bk B	Planet Earth	83
Spot On	Earth	84

G ADDITIONAL ACTIVITIES / READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=CxrlEajA398 (5 mins) [What is a habitat?]

1 C

Term 4, Week 1, Lesson C
Lesson Title: Features of the Earth
Time for lesson: 1½ hour

A POLICY AND OUTCOMES

Sub-Topic	Land and Water
CAPS Page Number	27

Lesson Objectives

By the end of the lesson, learners will be able to:

- name the seven continents and the five oceans on a map
- explain the main differences between oceans, seas and lakes
- distinguish between continents and islands

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing	✓	8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 3 and 4	A ball
A globe/ 3D model of the world	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> Why do people need the atmosphere around the Earth?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *It is the air that contains oxygen that we need to breathe.*

D ACCESSING INFORMATION

1. Draw the following onto the chalkboard (always try to do this before the lesson starts): Draw a rough copy of the map, the learners will copy it down into their books.

   a. The Earth is made up of land and water. The land is made up of **continents and islands**.
   b. Continents are very big pieces of land. There are seven continents. The continents are called Africa, Asia, Europe, Australia, North America, South America, and Antarctica.
   c. Islands are smaller than continents and are surrounded by water.
   d. Most of the Earth's **surface** is covered in water-oceans and seas.
   e. The five oceans are the Indian Ocean, the Atlantic Ocean, the Pacific Ocean, the Arctic Ocean and the Southern Ocean.

2. Explain this to the learners as follows:
   a. We need to know that there are seven continents. Using Resource 3, show the learners where each of the continents are on the picture.
   b. There are five oceans. Using Resource 3, show the learners where each of the oceans are.
3. Show the learners Resource 3, make sure you tell them that the Earth is a sphere (like a round ball). If possible, show the learners a globe. If a globe is not available, use a ball to demonstrate the concept of a sphere.
4. Give learners some time to copy the above information from the chalkboard into their workbooks. They do not need to copy the diagram of the map of the world.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. How are islands different to continents?
b. Which ocean is the biggest?

Answers to the checkpoint questions are as follows:

a. Continents are very big, islands are smaller.
b. The Pacific Ocean.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard:

> 1. To see the continents properly, we need to look at pictures that were taken of the Earth from space.
> 2. There are two big islands near South Africa, Madagascar, in the Indian Ocean and Robben Island in the bay outside Cape Town.

2. Read the information on the board to the learners.
3. Ask the learners if they have any questions. Provide answers where necessary.
4. Show the learners Resource 5.
5. Ask the learners to identify the different continents and oceans in each picture.
6. Tell the learners to look carefully at the picture of Africa. Look in the middle of the continent for the dark round shape. This is Lake Victoria, the largest Lake in Africa.
7. After looking at the pictures on Resource 4, tell the learners to copy these questions down into their book and answer them:

> a. Name the three smallest continents.
> b. Which two oceans are on each side of South Africa?

8. Give learners some time to complete this task in their exercise books.

> *a. Australia, Europe and Antarctica.*
> *b. The Atlantic and Indian Oceans.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Which ocean is all around the North Pole?
b. Which continent is nearest to Antarctica?

Answers to the checkpoint questions are as follows:

a. The Arctic Ocean
b. South America

9. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Planet Earth and Beyond	195
Study & Master	The Main Features of the Earth	135
Day by Day	Planet Earth	139
Platinum	Features of Earth	157
Viva	Features of the Earth	127
Oxford Successful	Features of the Earth	113
Shuters	Planet Earth	113
Sasol Inzalo Bk B	Earth and Beyond	92
Spot On	Earth	84

G ADDITIONAL ACTIVITIES / READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=K0UdPvA2OjY (3 mins) [Google Earth Tour – Continents and Oceans

2 A

Term 4, Week 2, Lesson A
Lesson Title: Earth seen from space.
Time for lesson: 1½ hour

A POLICY AND OUTCOMES

Sub-Topic	Earth and Space
CAPS Page Number	27

Lesson Objectives

By the end of the lesson, learners will be able to:

- define a Bird's Eye View
- identify features on the surface of the Earth from pictures
- visualise features as they look from a different point of view
- draw a picture of the school property from a Bird's Eye View

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing	✓	8. Predicting	✓	14. Designing	
3. Comparing	✓	9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 6	
A globe	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> What are the big areas of land on the Earth's surface called? How many are there?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *Continents. There are seven continents.*

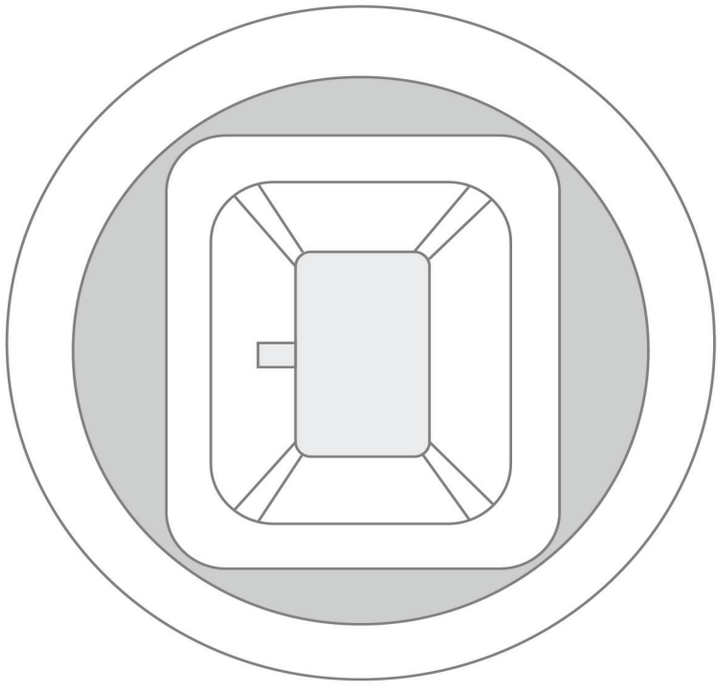
D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

> When an aeroplane takes a picture of a feature on the Earth, it sees it as a bird would see the feature. The higher up the aeroplane is in the sky, the smaller the feature will look. The closer to the Earth the aeroplane is, the bigger the feature will look.

2. Explain this to the learners as follows:
   a. In Lesson 1 this term, we looked at the view of the classroom from the roof, and you had to draw a picture of your desk from above. The view from above is called a Bird's Eye View.
   b. Tell the learners to look at Resource 6. Explain that the first picture is of the buildings in the centre of Johannesburg. These are very tall buildings, but we only see them as squares in the picture.
   c. Tell the learners to look at the bottom pictures on Resource 6. Tell the learners that they are Bird's Eye View pictures of Soccer City in Soweto in Gauteng. The first one is a close up, and the stadium fills the picture and you can see many details of the stadium. The second picture is taken from higher up. See how the stadium is now much smaller and that you can see more of the area around the stadium.
4. Ask learners to draw a view of the stadium in their books and to label it 'Bird's Eye View of Soccer City.'
5. Give learners some time to do this activity in their workbooks.

Example:



A Bird's Eye View of Soccer City

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What is it called when you see a feature from directly above it?
b. Why do you think we need to know what a Bird's Eye View looks like?

Answers to the checkpoint questions are as follows:

a. A Bird's Eye View.
b. It is important because we need to be able to see pictures of features on the Earth from above and be able to tell what they are. This helps us to draw maps.

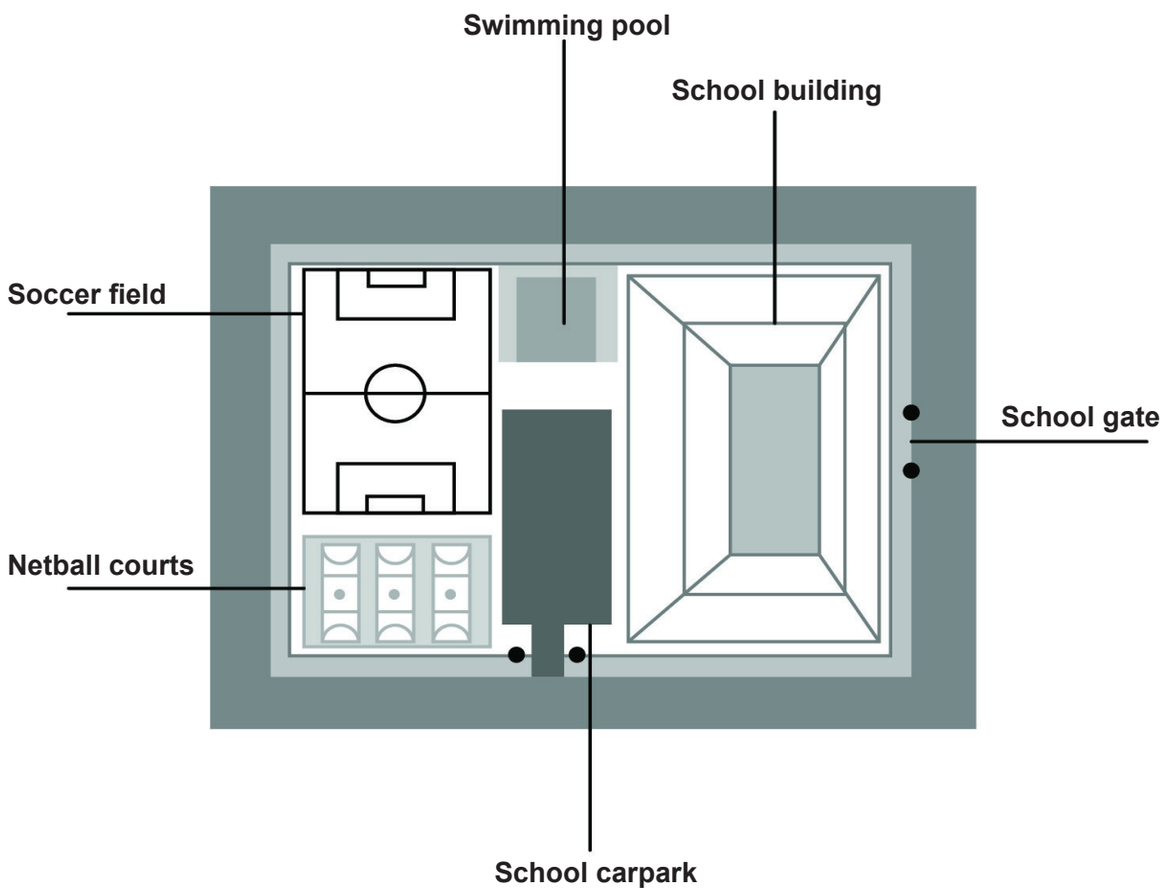
E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard:

> When we need to take a picture of the whole earth, we need to go up into space. We would need a spacecraft to go higher. We would now be able to see whole countries in our pictures.

2. Read the information on the board to the learners.
3. Show the learners the second picture on Resource 6.
4. Discuss what sort of buildings are shown in the picture.
5. After looking at the picture on Resource 6, tell the learners to think about their own school property. Ask the learners to draw a bird's eye view of your school property. They should include all features.
6. Ask the learners to label the different features of the school.
7. Give learners some time to complete this task in their workbooks.

An example of a school: Model Answer



Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Why do features on the earth look smaller in some bird's eye view pictures?
b. What large feature were we able to see on the continent of Africa?

Answers to the checkpoint questions are as follows:

a. The higher up the aeroplane is, the smaller the features will look in pictures.
b. Lake Victoria.

8. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Features of the Earth	193
Study & Master	Features of the Earth	135
Day by Day	Features of the Earth	138
Platinum	Features of the Earth	155
Viva	Features of the Earth	126
Oxford Successful	Features of the Earth	112
Shuter & Shooter	Features of the Earth	112
Sasol Inzalo Bk B	View of the Earth	85
Spot On	Earth	84

G ADDITIONAL ACTIVITIES / READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=fSE2uqls95Y (3 mins) Drawing Basics – How to draw a Bird's Eye View

2 B

Term 4, Week 2, Lesson B
Lesson Title: Earth & Space
Time for lesson: 1hour

A POLICY AND OUTCOMES

Sub-Topic	Earth as a Planet
CAPS Page Number	27

Lesson Objectives

By the end of the lesson, learners will be able to:

- identify what the Earth looks like from Space
- identify the shape of the Earth

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions	✓	13. Interpreting Information	✓
2. Observing	✓	8. Predicting		14. Designing	
3. Comparing	✓	9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 4, 20, 9, 10	
A globe	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> Why do people need to be able to see from a Bird's Eye View?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *People need to be able to identify features on the Earth from above. This helps them to draw maps. Maps have many uses including helping us with directions.*

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

> 1. We live on the planet Earth. A planet is a large object that moves around stars in space.
> 2. The Earth moves around a star called the Sun.
> 3. The Earth has a moon which is always moving around the Earth.
> 4. Our planet is in something called 'space'.
> 5. Space is a never-ending darkness that is filled with stars and other planets. In space there is no air, but there are gasses and dust.

2. Explain this to the learners as follows:
   a. We need to learn about the planet we live on and its place in space. The moon moves around the Earth, and the Earth is one of eight planets that move around the sun.
   b. Show the learners Picture 1 in the Resource 20.
   c. A star with planets moving around it is called a solar system.
3. Give learners some time to copy the information on the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

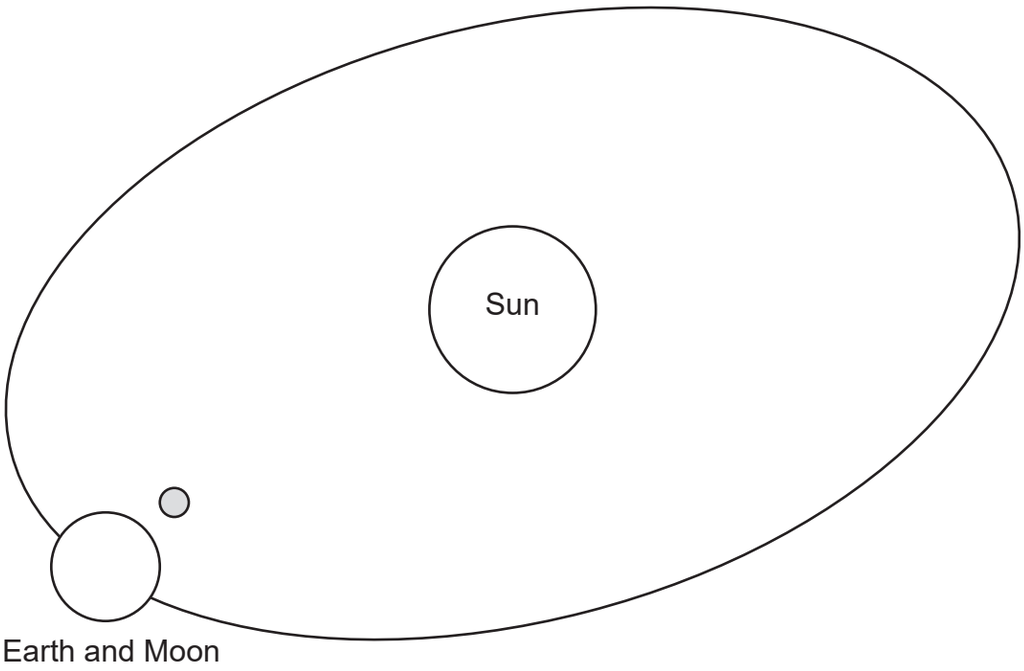
a. Is the Earth a star or a planet?
b. Is the sun a star or a planet?

Answers to the checkpoint questions are as follows:

a. The Earth is a planet.
b. The sun is a star

E CONCEPTUAL DEVELOPMENT

1. Draw and write the following onto the chalkboard:



This is the Earth and the Moon and the path that they take around the Sun. It takes the Earth 365 days to go around the Sun

2. Read the information on the board to the learners.
3. Ask the learners to draw the above diagram in their exercise books. Make sure the learners draw the Moon too.
4. The learners should label the sun, Earth and the moon.
5. Give learners some time to complete this task in their workbooks.

Write the following questions on the chalkboard:

1. *Which star does the Earth move around?*
2. *Name four things that can be found in space?*

6. Show the learners Resource 9 and 10.
7. Discuss the planets that are in the Sun's solar system with the learners. What are the names of the planets?
8. After looking at the pictures on Resource 9 and 10, tell the learners to copy the questions from the chalkboard and to answer them in their workbooks.

1. *The Earth moves around the sun.*
2. *Stars, planets, gasses and space-dust.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Is our solar system the only solar system?
b. How many days does it take the Earth to move around the Sun?

Answers to the checkpoint questions are as follows:

a. No, there are many solar systems, but they are very far away and so we do not know much about them.
b. It takes 365 days for the Earth to move around the Sun.

9. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	The Earth in Space	201
Study & Master	Earth and Space	114
Day by Day	Earth and Space	143
Platinum	Earth and Space	160
Viva	Earth and Space	134
Oxford Successful	Earth and Space	116
Shuter & Shooter	Earth and Space	117
Sasol Inzalo Bk B	Earth and Beyond	98
Spot On	Earth and Space	86

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=yXKWrnF7yRM (3 mins) [Earth from Space]

2 C

Term 4, Week 2, Lesson C
Lesson Title: Earth & Space
Time for lesson: 1hour

A POLICY AND OUTCOMES

Sub-Topic	The sun, the moon & stars
CAPS Page Number	27

Lesson Objectives

By the end of the lesson, learners will be able to:

- identify what people can see from Earth
- name the differences between stars and planets
- explain why the sun only shines on half of the Earth at a time

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions	✓	13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 21	
Torch	
Soccer Ball	
Sticker	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What shape is the Earth?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

The Earth is the shape of a ball. We call this ball a sphere.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

THE EARTH AND THE SUN

1. From Earth, we can see the sun during the day and the moon and stars at night.
2. A star is a huge bright ball of gas which stays in the same place.
3. We only see the sun during the day because the part of the Earth we are on is facing the Sun.
4. We see the moon because it is the nearest thing in space, to the Earth. When we see the moon shining brightly, we are seeing the light from the sun reflecting on the Moon.
5. There are millions of stars in space. Stars shine all the time, but we cannot see them during the day because the light from the sun is too bright.

2. Explain this to the learners as follows:
   a. From Earth, we can see the moon, the sun and millions of stars.
   b. The stars are very far away. The star in our solar system that the Earth moves around is the sun.
3. Give learners some time to copy the above information written on the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What is a star?
b. Why does the moon shine brightly on some nights?

Answers to the checkpoint questions are as follows:

a. A ball of gas that stays in the same place.
b. The Moon shines brightly on some nights because the light from the sun is reflecting onto it.

E CONCEPTUAL DEVELOPMENT

1. Read the information on the board to the learners.
2. Set up the torch and the soccer ball on the front desk. Stick the sticker onto the soccer ball. Ask a learner to switch off the lights in the classroom. Shine the torch onto the soccer ball.
3. Ask the learners to confirm that half of the ball is being lit up, and the back half is still dark. Shine the torch onto the sticker and then slowly rotate the ball.
4. Tell the learners to watch the sticker going from the light, into the darkness and back into the light. This represents day and night on the Earth.
5. Switch the classroom lights back on.
6. After looking at Resource 21, tell the learners to copy these questions down into their work-book and answer them:

    1. Why do you think the people living in cities see fewer stars than people living in the countryside?
    2. Why are some stars brighter than others?

7. Give learners some time to complete this task in their exercise books.

Model Answer:

1. There are bright lights in cities, and these lights make it difficult to see the stars.
2. Some stars are brighter than others because they are closer.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Where do the stars go during the day?
b. Does the moon have its own light?

Answers to the checkpoint questions are as follows:

a. The stars do not go anywhere. They are still there, but the sun is very bright and so we cannot see the stars.
b. No, it reflects the light from the sun shining on it.

8. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Earth and Space	202
Study & Master	Earth and Space	144
Day by Day	Earth and Space	144
Platinum	Earth and Space	161
Viva	Earth and Space	134
Oxford Successful	Earth and Space	117
Shuter & Shooter	Earth and Space	121
Sasol Inzalo Bk B	Earth and Beyond	98
Spot On	Earth and Space	86

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=Un5SEJ8MyPc (9 min) [A Space Journey]

TOPIC OVERVIEW:
The Sun
Term 4, Week 3

A. TOPIC OVERVIEW

Term 4, Weeks 3a – 3c

- This topic runs for 1 week.
- This topic counts for 5% in the end of year final exam (TBC)
- It is presented over 3 lessons.
- This topic's position in the term is as follows:

LESSON	WEEK 1			WEEK 2			WEEK 3			WEEK 4			WEEK 5		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

LESSON	WEEK 6			WEEK 7			WEEK 8			WEEK 9			WEEK 10		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

B. SEQUENTIAL TABLE

GRADE 3 & Foundation Phase	GRADE 4	GRADE 5 & 6
LOOKING BACK	**CURRENT**	**LOOKING FORWARD**
• Stars and planets – what they are	• Our closest star • Made of hot gas • Gives off light and heat • Vital for life on Earth	• The earth moves • The Earth orbits the sun

C. SCIENTIFIC AND TECHNOLOGICAL VOCABULARY

Ensure that you teach the following vocabulary at the appropriate place in the topic:

	TERM	EXPLANATION
1.	Sun	a very bright star that gives off light and heat to the Earth
2.	star	bodies in space that give off their own light
3.	planet	a large round body that moves around a star
4.	energy	strength that you need to do something. You get energy from light, heat and food.
5.	ray	a line of light and heat coming straight from the Sun.
6.	reflect	to bounce or give back light or heat without taking any in.

D. UNDERSTANDING THE USES / VALUE OF SCIENCE

This topic will teach the learners about the planet they live on, and how it is viewed from space. The learners will learn about land features and how they influence the use of the land.

E. PERSONAL REFLECTION

Reflect on your teaching at the end of each topic:

Date completed:	
Lesson successes:	
Lesson challenges:	
Notes for future improvement:	

3 A

Term 4, Week 3, Lesson A
Lesson Title: The Sun
Time for lesson: 1½ hour

A POLICY AND OUTCOMES

Sub-Topic	Our Closest Star
CAPS Page Number	27

Lesson Objectives

By the end of the lesson, learners will be able to:

- list the characteristics of the sun
- explain why the sun is important for life on Earth

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions	✓	13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 7	
A grain of rice	
Soccer Ball	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> Which is bigger, the sun or the Earth?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *The sun is bigger. It only seems very small because it is far away.*

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

THE SUN

1. Sun is the main source of energy.
2. The Sun is a star. It is a ball of very hot gas which is exploding all the time.
3. The Sun gives off light. This light reflects onto the planets.
4. The light and heat from the Sun are called rays.
5. The sun's rays are too bright for people to look at. A lot of the sun's rays are dangerous for human skin.
6. The Sun is very big. It is bigger than the moon and the earth.

2. Explain this to the learners as follows:
   a. The sun is a very big star and is the closest star to Earth. It is made of very hot gasses which cause very big explosions all the time. Flames shoot off into space. It is very hot near the sun.
   b. The sun gives off light and heat in rays. These are what causes our skin to burn if we are in the sun for too long.
3. Show the learners the pictures on Resource 7.
   a. Discuss what the learners can see on the pictures. The first picture is the sun. Look and see how hot those flames look.
   b. The second picture has a small Earth near the sun. Explain to the learners that the Earth is not this close to the Sun. This picture is only to show how big the sun is compared to the Earth.
   c. In the second picture, the learners can see some of the flames coming off the sun.
4. Give learners some time to copy the information on the chalkboard into their workbooks.
5. Ask the learners if they have any questions and provide answers and explanations.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What is the Sun made of?
b. Do planets give off light?

Answers to the checkpoint questions are as follows:

a. The Sun is made of hot gasses that are exploding all the time.
b. No, planets reflect light from their star, the Sun.

E CONCEPTUAL DEVELOPMENT

1. Do the following exercise with the learners:
   a. Take your grain of rice and show it to the learners. Ask the learners what they think it will represent.
   b. Take the soccer ball and show it to the learners. Ask the learners what they think it will represent.
   c. Ask one learner to hold the soccer ball and tell the learners that this will represent the Sun.
   d. Take the grain of rice and break it in half. Give it to another learner to hold. Tell the learners that this will represent the Earth.
   e. Ask the learners to hold their ball and grain of rice together to compare their sizes in front of the class.
   f. Now take the class outside onto the playground and find a big area to work in.
   g. Tell the learner holding the half a grain of rice to take 24 big steps away from the boys holding the soccer ball. Ask the class to count with him.
   h. Show the learners that the grain of rice is the Earth and that it is tiny when compared to the soccer ball so far away. This distance would be like the distance of the Earth to the sun.
   i. Move back into the classroom.
2. Tell the learners to copy these questions down into their workbook and answer them:

> 1. Does the Sun shine all the time?
> 2. Which is bigger, the Moon or the Sun?
> 3. Why is the Sun important Earth?

3. Give learners some time to complete this task in their workbooks.

> *1. Yes, the Sun does shine all the time. We just cannot see it when it is night time.*
> *2. The Sun is bigger; it just looks small because it is so far away.*
> *3. The Sun gives heat and light to the Earth; and Sun is the source of energy.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. How does the Sun send heat and light to Earth?
b. How many moons does the Earth have?

Answers to the checkpoint questions are as follows:

a. The Sun sends heat and light rays to Earth.
b. The Earth only has one moon.

4. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	The Sun	206
Study & Master	The Sun	146
Day by Day	The Sun	147
Platinum	The Sun	164
Viva	The Sun	138
Oxford Successful	The Sun	118
Shuters	The Sun	119
Sasol Inzalo Bk B	The Sun	100
Spot On	Our closest star	87

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=VkW54j82e9U (4 min) [The Sun for Kids]

3 B

Term 4, Week 3, Lesson B
Lesson Title: The Sun and Life
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Our Closest Star
CAPS Page Number	27

Lesson Objectives

By the end of the lesson, learners will be able to:

- describe the position of the Earth from the sun
- understand why we need the sun on Earth

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying	✓	11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 8	
Globe	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> Is the sun a planet or a star?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *The Sun is a star. It does not move in space. Planets move around stars.*

D ACCESSING INFORMATION

1. Draw the following table onto the chalkboard (always try to do this before the lesson starts):

> THE EARTH AND THE SUN
>
> 1. The Sun is the closest star to Earth.
> 2. It is 150 million kilometres away.
> 3. Light from the Sun takes about 8 minutes to reach the Earth.
> 4. The Earth is exactly the right distance from the Sun for life. It does not get too hot or too cold.
> 5. Plants get their energy from the Sun.
> 6. Animals that eat plants get their energy from eating the plants.
> 7. People and animals use the sun's rays to get warm.

2. Explain this to learners as follows:
   a. Even though the sun is the closest star to Earth, it is still very far away. It would take a person 142 years to drive there if they drove at 100 km/hour. The sun would have melted them long before they get there.
   b. The sun's rays give out light and heat energy. Plants use this energy to grow. Animals eat the plants and the energy is now in them. When meat eating animals or people eat the animals that eat plants, the energy moves into them. All living things use up energy.

c. If the Earth was closer to sun, it would be too hot on the Earth for anything to grow or live.

d. If the Earth was further away from the Sun, it would be too cold on Earth for anything to grow or live.

3. Show the learners the globe. Show the learners the top and the bottom of the Earth, those areas are frozen; lots of ice. They are frozen because the heat from the Sun does reach there.
4. Give learners some time to copy the information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. How long does light from the Sun take to reach Earth?

b. Where do plants get their energy to grow, from?

Answers to the checkpoint questions are as follows:

a. Light take about 8 minutes to reach the Earth from the Sun

b. Plants get their energy to grow from the Sun's rays.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard:

USES OF THE SUN

The sun has many uses for people on Earth.

We use the sun to dry things that are wet.

We use the sun to warm up things that are cold.

We could use it to tell the time

2. Look at the picture on Resource 8 with the learners.
3. The first picture is of clothes drying on a washing line. The heat in the sun's rays are drying the water out of the clothes.
4. The second picture is of a solar-powered geyser. A geyser uses electricity to heat water up for people to use in their houses. A solar-powered geyser does not use electricity, but converts heat and light from the sun into energy that powers the geyser.
5. The third picture is of a sundial. This was a tool used before watches and clocks, to tell the time. The shadow made by the piece in the middle will move throughout the day and where it falls, the time can be read from it. This does not work when the sun is not shining.
6. Read through the facts with the learners.
7. After looking at the pictures on Resource 8, tell the learners to copy these questions down into their workbook and answer them:

1. Make a list of four different uses for the sun on Earth.
2. Why don't we get our heat and light from the other stars?

8. Give learners some time to complete this task in their workbooks.

1. *Any of the following: to dry your clothes, to grow food, to heat water, to make electricity, to keep warm, to cook food, to tell the time.*
2. *The other stars are too far away.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What is a sundial?
b. Do you think the sun is important for people on Earth?

Answers to the checkpoint questions are as follows:

a. A sundial is used to tell the time using the sun.
b. Yes, the sun is important for people on Earth. They need it to grow food, to keep warm, to dry things that are wet.

9. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	The Sun	206
Study & Master	The Sun	146
Day by Day	The Sun	147
Platinum	The Sun	164
Viva	The Sun	138
Oxford Successful	The Sun	118
Shuters	The Sun	119
Sasol Inzalo Bk B	The Sun	100
Spot On	Our closest star	87

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=VkW54j82e9U (4 min) [The Sun for Kids]

3 C

Term 4, Week 3, Lesson C
Lesson Title: The Sun and Life
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Our Closest Star
CAPS Page Number	27

Lesson Objectives

By the end of the lesson, learners will be able to:

- describe the size of the sun and the Earth
- make a model of the sun
- write a description of the dangers of the sun

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing	✓	8. Predicting		14. Designing	✓
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 7 and 8	
4 pieces of A4 scrap paper per learner	
1 piece of stiff cardboard per learner	
yellow, orange and red paint/colouring in pens or crayons	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> Where do animals that eat plants get their energy from?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *Animals that eat plants, get their energy from the plants they eat.*

D ACCESSING INFORMATION

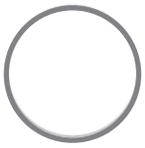
1. Draw the following table onto the chalkboard (always try to do this before the lesson starts):

MODEL BUILDING INSTRUCTIONS:

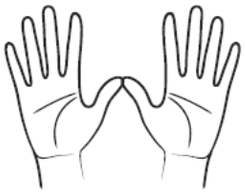
1. Take a large bowl and use it to help you to draw a large circle on your cardboard.
2. Cut out the circle.
3. Paint or colour in the circle so that it looks like the surface of the sun.
4. Trace around your hand twice on each piece of scrap A4 paper. Do this four times, so you have eight hands drawn on paper.
5. Colour the hands in to look like heat and light from the sun.
6. Cut all the hands out.
7. Stick the hands on the back on your big circle so the fingers stick out the side of the edge.

2. Hand out one piece of cardboard and four pieces of scrap A4 paper to each learner.
3. Explain this to the learners as follows:
   a. We are going to make models of the Sun.
   b. Each learner needs to have scissors, glue and coloured crayons or pens.
   c. We need to make sure we follow the instructions on the board very carefully.
4. Show the learners the pictures of the sun on Resource 7. Show the learners the big flames coming off the sun.
5. Give learners some time to make the model.

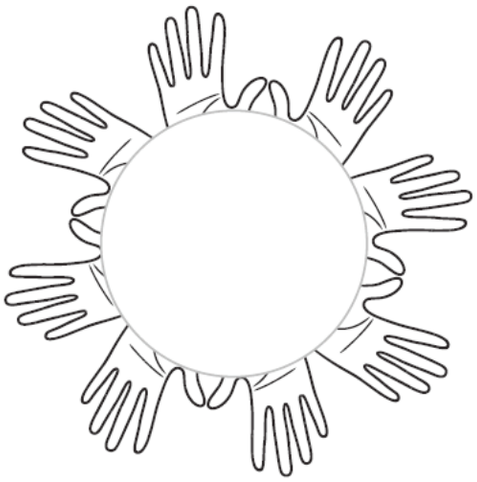
Example: Model of the Sun



Make one of these circles



Make four of these pairs



Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What does the shape of the model show about the sun?
b. What do your fingers coming from the sun show?

Answers to the checkpoint questions are as follows:

a. The shape shows that Sun is a round ball of hot gas.
b. The fingers show the flames that come out from the sun.

E CONCEPTUAL DEVELOPMENT

1. Write the following instructions onto the chalkboard:

DESCRIBING THE SUN

1. Write a letter to your friend.
2. You need to describe the sun.
3. Draw pictures to help you describe the sun to your friend.
4. Don't forget to tell your friend about the dangers of direct exposure to the sun.

2. Tell the learners the following:
   a. Imagine you have a friend who lives on another planet, very far away from the sun.
   b. Write a letter to your friend, describing the sun.
   c. Draw pictures to help your friend understand what the sun is and what it does.
   d. Remember to tell your friend about the dangers of the sun too.
3. Read through the instructions with the learners.
4. After you have read through the instructions tell the learners to write the letter to their friend.
5. Give learners some time to complete this task in their workbooks.

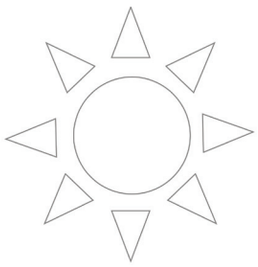
MODEL ANSWER

Dear Mandla

I am writing to tell you about the sun. It is a very big hot ball of gas which keeps exploding, but it is not as dangerous to us because it is so far away. It provides the earth with light and heat.

The plants need the sunlight to grow. These plants are our food.

Here is a picture of the Sun showing how big it seems to me.



We do need to be careful of too much sun. Our skin can be burnt if we are outside for too long. We also need to make sure we don't look directly into the sun, it will damage our eyes permanently.

I would love for you to come and visit so we can experience the sun together.

Have fun.

from

Angie

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Name the star that is closest to Earth.

b. What does a solar-powered geyser do?

Answers to the checkpoint questions are as follows:

a. The sun is the closest star to the Earth.

b. A solar-powered geyser uses the sun's rays to heat up water.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	The Sun	206
Study & Master	The Sun	146
Day by Day	The Sun	147
Platinum	The Sun	164
Viva	The Sun	138
Oxford Successful	The Sun	118
Shuters	The Sun	119
Sasol Inzalo Bk B	The Sun	100
Spot On	Our closest star	87

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=tI0GqYJha1Q (3 mins) [Sundials]

TOPIC OVERVIEW:
The Earth and the Sun
Term 4, Week 4

A. TOPIC OVERVIEW

TERM 4, WEEKS 4A – 4C

- This topic runs for 1 week.
- It is presented over 3 lessons.
- This topic counts for 5% in the end of year final exam.
- This topic's position in the term is as follows:

LESSON	WEEK 1			WEEK 2			WEEK 3			WEEK 4			WEEK 5		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

LESSON	WEEK 6			WEEK 7			WEEK 8			WEEK 9			WEEK 10		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

B. SEQUENTIAL TABLE

GRADE 3 & Foundation Phase	GRADE 4	GRADE 5 & 6
LOOKING BACK	**CURRENT**	**LOOKING FORWARD**
• Space • Stars and planets – what they are • Names of the Planets	• The Earth travels in an orbit around the sun • The sun as the centre of the solar system • The Earth is one of 8 planets in the solar system • The sun and life • The Earth gets the right amount of light and heat from the sun to support life	• The Earth Moves • The Earth travels in an orbit around the sun • The Earth takes about 365 days to travel around the sun • The Earth takes 24 hours to spin on its own axis.

C. SCIENTIFIC AND TECHNOLOGICAL VOCABULARY

Ensure that you teach the following vocabulary at the appropriate place in the topic:

	TERM	EXPLANATION
1.	solar system	the sun and all the objects that move around it. This includes planets, moons, and rocks
2.	orbit	the pathway that something takes around another object which is still or not moving
3.	rotates	to move or to cause something to turn in a circle or around a fixed place. 
4.	axis	an imaginary line around which something rotates
5.	dwarf planet	something that looks like a small planet, but does not have all the characteristics of a full planet

D. UNDERSTANDING THE USES / VALUE OF SCIENCE

Learners will understand how the Earth rotates, giving us night and day, and also how the Earth orbits around the Sun to give us our seasons.

E. PERSONAL REFLECTION

Reflect on your teaching at the end of each topic:

Date completed:	
Lesson successes:	
Lesson challenges:	
Notes for future improvement:	

4 A

Term 4, Week 4, Lesson A
Lesson Title: The Earth's orbit around the Sun
Time for lesson: 1 hour

POLICY AND OUTCOMES	
Sub-Topic	Moving around the Sun
CAPS Page Number	28

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain how the Earth moves around the Sun
- identify the position of the Earth in our Solar System

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing	✓	8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

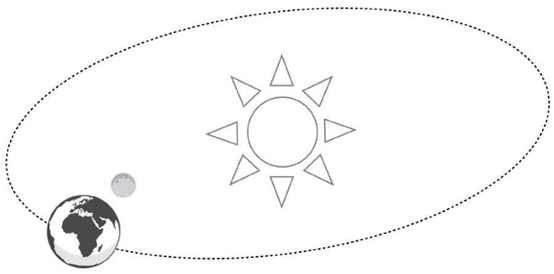
For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 9	
Globe	

C CLASSROOM MANAGEMENT

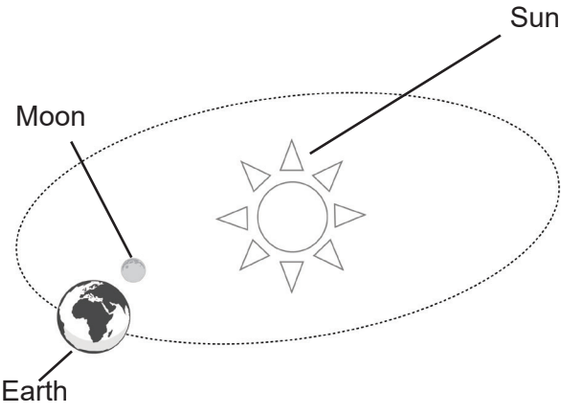
1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

Copy this picture and fill in labels:



3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

Model Answer:



D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts).

THE EARTH'S ORBIT AROUND THE SUN

a. The Earth and the other planets move around the sun along a pathway called an orbit.
b. The sun is at the centre of our solar system. The Sun does not move.
c. The Earth takes one year to orbit the sun.
d. Sometimes the Earth is closer to the sun, and sometimes further away.
e. Earth is one of 8 planets in our Solar System that are moving around the Sun.

2. Explain this to the learners as follows:
   a. We need to know that the path the planets take around the Sun is called an orbit. These paths do not change for each planet.
   b. Each planet takes a different length of time to go around the sun.
3. Show the learners Resource 9. Show them the sun in middle of the picture. Then show the learners the planets and how each planet has its own orbit around the sun.
4. Give learners some time to copy the information written on the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What is the Earth's path around the sun called?
b. How long does it take the Earth to move around the Sun?

Answers to the checkpoint questions are as follows:

a. The Earth's path around the sun is called an orbit.
b. The Earth takes 365 days or one year to move around the sun.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard:

THE EARTH ROTATES

1. The Sun pulls the planets towards itself so that they stay in the same orbit.
2. The Earth also rotates (spins) continually on its own axis.
3. The Earth's axis is an imaginary line that runs through the centre of the Earth from the North Pole to the South Pole.
4. This rotation causes day and night. Day is when our side of the Earth is facing the sun and night is when our side of the Earth is facing away from the sun.

2. Explain this task to the learners as follows:
    a. We need to know that the Earth spins on its own axis as well as moves around the sun in an orbit.
    b. The Earth's axis is a central line that we can imagine runs from the North Pole to the South Pole through the centre of the Earth.
3. Ask the learners to draw the picture of a solar system from Resource 9 in their workbooks.
4. The learners should label the planets.
5. After looking at the picture on Resource 9, tell the learners to copy these questions down in their workbooks and to answer them:

    1. In what two ways does the Earth move?
    2. Write down the names of the four seasons of the year.

6. Give learners some time to complete this task in their exercise books.

    1. *The Earth orbits around the Sun, and it spins on its own axis.*
    2. *Summer, Autumn, Winter, Spring*

7. Give learners some time to complete this task in their exercise books.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What is the imaginary line running through the centre of the Earth from the North Pole to the South Pole?
b. How long does the Earth take to orbit the sun?

Answers to the checkpoint questions are as follows:

a. The Earth's axis.
b. It takes one year for the Earth to orbit the sun.

8. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	The Earth and the Sun	214
Study & Master	The Earth and the Sun	148
Day by Day	Moving around the Sun	155
Platinum	Moving around the Sun	167
Viva	The Earth and the Sun	144
Oxford Successful	The Earth and the Sun	120
Shuters	The Earth and the Sun	121
Sasol Inzalo Bk B	The Earth and the Sun	110
Spot On	Moving around the Sun	88

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=cDed5eXmngE (4 mins) [Rotation and Revolution of Earth]

4 B

Term 4, Week 4, Lesson B
Lesson Title: Planets in the Solar System
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Moving around the Sun
CAPS Page Number	28

Lesson Objectives

By the end of the lesson, learners will be able to:

- identify the eight planets of the solar system
- list the eight planets in the correct order from the sun
- compare the differences between planets and stars

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying	✓	11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 11	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> How many planets are there in the solar system?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *There are eight planets in the solar system.*

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts).

> THE PLANETS
>
> 1. The planets in our solar system are: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.
> 2. Pluto used to be called a planet, it is now known as a dwarf planet.
> 3. Earth is the only planet in our solar system that can support life.
> 4. The planets all take different lengths of time to complete their orbits of the sun.
> 5. The first four planets are made of rock, and the next four are made of gasses.

2. Explain this to the learners as follows:
   a. We are going to learn about the other planets in our solar system.
   b. The other planets also orbit around the sun. The planets that are close move around the sun very quickly because they do not have far to travel. Mercury takes 88 Earth days. The planets further away from the Sun take a lot longer. Neptune takes 165 Earth years to orbit the Sun once.
3. Ask learners to look at Resource 11. The planets are in order of their placement from the sun: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.
4. Give learners some time to copy the information written on the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. Where is the sun in the solar system?

b. What planet is closest to the sun?

Answers to the checkpoint questions are as follows:

a. The sun is in the centre of the solar system.

b. Mercury is the closest planet to the sun.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard:

The order of the planets can be easily remembered by making up a simple rhyme by using the first letter of each planets name:

M*ercury* – **V***enus* – **E***arth* – **M***ars* – **J***upiter* – **S***aturn* – **U***ranus* – **N***eptune*

M – V – E – M – J – S – U – N

M*y* – **V***ery* – **E***ducated* – **M***other* – **J***ust* – **S***erved* – **U***s* – ***N****yama*

1. Explain this task to the learners as follows:
   a. Sometimes learning a list of names can be made easier by taking the first letter of each name and making up a rhyme. We call this a mnemonic.
   b. You just now need to remember the rhyme and the list becomes easy to recall.
2. Ask the learners to make up a rhyme or mnemonic of their own for the planet's names and to write it into their books.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Which is the furthest planet from the sun?

b. One group of planets are made of rock. What are the other planets made of?

Answers to the checkpoint questions are as follows:

a. Neptune is the furthest planet from the sun.

b. They are made of gas.

3. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	The Earth and the Sun	214
Study & Master	The Earth and the Sun	148
Day by Day	Moving around the Sun	155
Platinum	Moving around the Sun	167
Viva	The Earth and the Sun	144
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Shuters	The Earth and the Sun	121
Sasol Inzalo Bk B	The Earth and the Sun	110
Spot On	Moving around the Sun	88

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=5c_IL6I3OaA (9 mins) [Planets in our solar system]

4 C

Term 4, Week 4, Lesson C
Lesson Title: The Sun and Life
Time for lesson: 1½ hour

A POLICY AND OUTCOMES

Sub-Topic	The sun upports Life
CAPS Page Number	28

Lesson Objectives

By the end of the lesson, learners will be able to:

- describe the effect the sun has on living things on Earth
- list the benefits of the sun on Earth
- draw a diagram of the flow of energy on Earth

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS AND DESIGN SKILLS

1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing	✓	9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	✓
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 22	
A pot plant or a branch in water. Some of the leaves must be covered up so that they cannot get any light. This should be done a few days before the lesson.	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> Write down the names of the eight planets in order from the sun.

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune*

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts).

> ENERGY FROM THE SUN
>
> The Earth receives the right amount of light and heat from the sun to support life.
>
> All living things on Earth need the sun to survive and grow.
>
> Plants use the sun together with water and gasses to make their own food.
>
> When animals eat the plants, the energy is transferred from the plants to the animals.
>
> Energy moves from one living thing to another.

2. Explain this to the learners as follows:
   a. As we saw in the second lesson in the third week, Earth is the only planet in our solar system with the right temperature for us to live on, it is not too hot and not too cold.
   b. We are also reminded that the energy is transferred from plants to plant eating animals and then to meat eating animals.
   c. We need to remember that if there was no sun, then no plants would grow. If the plants didn't grow then animals would have nothing to eat.
3. Give learners some time to copy the information written on the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. Where do plants get their energy from?

b. What would happen if there was no sun?

Answers to the checkpoint questions are as follows:

a. Plants get their energy from the sun.

b. If there was no sun, plants would not be able to grow. Animals would not have any food, and they would die.

E CONCEPTUAL DEVELOPMENT

1. Show Resource 22 to the learners.
   a. Discuss the picture with the learners. Tell them it shows the flow of energy in nature.
   b. The sun shines down on the plants. They use the light and heat to grow. The animals eat the plants and the energy is transferred form the plant to the animal. The animal is then eaten by a meat eating animal and the energy is then transferred to them.
   c. When an animal dies, and their body decomposes, the energy is released back to the ground for the plants to use.
2. Write the following questions on the board for the learners to write down and answer in their workbooks:

1. Why is the Earth's distance from the sun important?
2. What does the sun give off that supports life on Earth?
3. Which planet is so small it is no longer called a planet?
4. Do all the planets take the same amount of time to orbit the sun?

1. *The sun's distance to the Earth is important because if the distance were greater it would be too cold on Earth for life, and if it were closer to the Sun it would be too hot.*
2. *The sun gives off rays of heat and light.*
3. *Pluto has now been changed to a dwarf planet.*
4. *No, the planets all take different lengths of time to orbit the sun.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Which is the furthest planet from the sun?

b. One group of planets are made of rock. What are the other planets made of?

Answers to the checkpoint questions are as follows:

a. Neptune is the furthest planet from the sun.

b. They are made of gas.

3. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	The Sun and Life	220
Study & Master	The Sun and Life	155
Day by Day	The Sun and Life	160
Platinum	The Sun and Life	170
Viva	The Sun and Life	145
Oxford Successful	The Sun and Life	124
Shuters	The Sun and Life	123
Sasol Inzalo Bk B	The Sun and Life	118
Spot On	The Sun and Life	90

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=9RTkZaX1cH0 (14 mins) [What a planet needs to sustain life]

TOPIC OVERVIEW:

The Moon

Term 4, Weeks 5A – 6C

A. TOPIC OVERVIEW

TERM 4, WEEKS 5A – 6C

- This topic runs for 2 week.
- It is presented over 6 lessons.
- This topic counts for 10% in the end of year final exam.
- This topic's position in the term is as follows:

LESSON	WEEK 1			WEEK 2			WEEK 3			WEEK 4			WEEK 5		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

LESSON	WEEK 6			WEEK 7			WEEK 8			WEEK 9			WEEK 10		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

B. SEQUENTIAL TABLE

GRADE 3 & FOUNDATION PHASE	GRADE 4	GRADE 5 & 6
LOOKING BACK	**CURRENT**	**LOOKING FORWARD**
• Space • Stars and planets what they are • Names of the planets • Space Travel	• Features of the moon • Phases of the moon • Moon Stories – cultural stories about the Moon	• Moons including Earth's moon • Features of the moon

C. SCIENTIFIC AND TECHNOLOGICAL VOCABULARY

Ensure that you teach the following vocabulary at the appropriate place in the topic:

	TERM	EXPLANATION
1.	Word/Phrase/ Concept	Definition/Explanation/Diagram
2.	craters	large holes in the surface of the moon that have been made by meteorites
3.	meteorites	rocks that travel through space at speed
4.	telescope	something we can look through that makes objects in the distance appear closer
5.	diameter	the distance from one edge of a circle to the opposite edge, going straight through the middle

6.	lunar	anything that has to do with the moon
7.	satellite	a moon or other object in space that orbits a planet
8.	data	information that has been collected to tell people more about something
9.	eclipse	when the light from one object is blocked by another object
10.	lunar eclipse	when the light from the sun onto the moon is blocked by the Earth
11.	solar eclipse	when the light from the sun onto the Earth is blocked by the moon
12.	phases of the moon	the different shapes the moon shows throughout the month depending on how much sunlight is reflected off it
13.	crescent shaped	looks like the letter C
14.	new moon	none of the moon can be seen
15.	full moon	all of the moon can be seen
16.	cycle	A process that repeats itself over and over

D. UNDERSTANDING THE USES / VALUE OF SCIENCE

This topic will teach the learners more about the features of the moon and as well as the phases the moon goes through each month. The learners will also explore the role of moon in diverse cultures through stories. .

E. PERSONAL REFLECTION

Reflect on your teaching at the end of each topic:	
Date completed:	
Lesson successes:	
Lesson challenges:	
Notes for future improvement:	

5 A

Term 4, Week 5, Lesson A
Lesson Title: The Moon
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Features of the Moon
CAPS Page Number	29

Lesson Objectives

By the end of the lesson, learners will be able to:

- identify the moon and the features on the moon
- describe the life necessities that do not exist on the Moon

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing	✓	8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 13, 14 and 15	A bottle or glass filled with water

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> What two sources of energy do plants get from the sun?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *The two sources of energy plants get from the sun are light and heat energy.*

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts):

> THE MOON
>
> 1. The surface of the moon is dry and rocky.
> 2. The surface of the moon is covered in large dents, called craters. These were caused by meteorites.
> 3. There is no water on the Moon, so nothing can grow.
> 4. There is no atmosphere around the Moon, so that means there is no air.
> 5. The Moon takes about a month to move around the Earth.

1. Explain this to the learners as follows:
   a. Today we are going to learn about the Moon. It is the closest celestial body to the Earth. It is the one body that scientists have been able to look at in detail. Since the invention of telescopes, we have been able to see that it is a cold, rocky.
   b. The moon is rocky and dusty and has many big holes called craters. Scientists say that these craters have been caused by meteorites crashing into the moon.
   c. The moon has no life, no water, no air and no atmosphere.
2. Ask learners if they have noticed the Moon. What do they notice most about the Moon?
3. Give learners some time to copy the information written on the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What shape is the moon?

b. What is the moon made of?

Answers to the checkpoint questions are as follows:

a. The moon is a ball shaped.

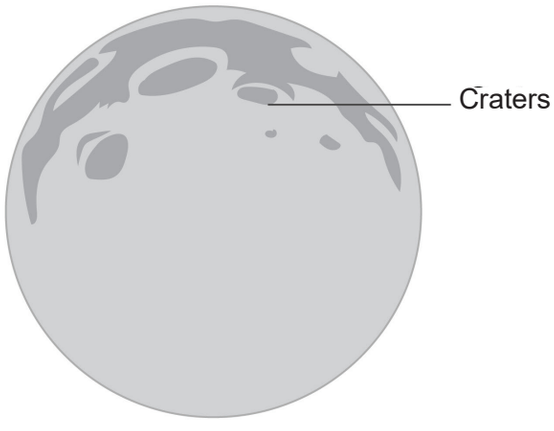
b. The moon is made of rock.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard:

There are some mountains as high as Mount Everest on the moon. There are also very deep valleys. There is no water on the moon and not enough heat and light for life to develop and grow.

2. Explain this task to the learners as follows:
   a. Look at Resource 13. In the picture, you can see the craters on the surface of the moon. There are craters of all different sizes.
   b. Discuss what might have happened to make craters of those different sizes.
   c. Look at Resource 14. In the picture, you can see the shape of the moon. In the black and white photograph, you can feel that the surface must be empty and lifeless.
   d. Look at Resource 15. In the picture you can see an astronaut and his space craft. Look carefully at the surface of the moon. There are rocks and dust. You can see the dust because the astronaut has made footprints.
   e. As there is no air on the Moon, that means there is also no wind. That means those footprints are still there today.
3. Ask the learners to copy down the note above into their workbooks. Following the note, ask the learners to draw a picture of the Moon with some craters on its surface. The learners should label the features.
4. Give learners some time to complete this task in their workbooks.



Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What is missing on the moon to make life possible?
b. What made the dents on the surface of the moon?

Answers to the checkpoint questions are as follows:

a. Light, heat, air and water are missing from the moon.
b. The round shapes were made by meteorites smashing into the moon.

5. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	The Moon	223
Study & Master	The Moon	158
Day by Day	The Moon	163
Platinum	The Moon	176
Viva	The Moon	153
Oxford Successful	The Moon	126
Shuter & Shooter	The Moon	125
Sasol Inzalo Bk B	The Moon	154
Spot On	Features of the Moon	91

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=JM21GBJecx0 (5 mins) [All about the Moon: The Moon]

5 B

Term 4, Week 5, Lesson B
Lesson Title: Comparing the Earth to the moon
Time for lesson: 1½ hour

A POLICY AND OUTCOMES

Sub-Topic	Features of the Moon
CAPS Page Number	29

Lesson Objectives

By the end of the lesson, learners will be able to:

- distinguish between the sizes of the moon and the Earth
- list the differences between the Earth and the moon
- make a model of the Earth and the moon

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	✓
3. Comparing		9. Hypothesizing		15. Making/ constructing	✓
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Newspaper, cardboard and scrap paper	
Paint or coloured pens or crayons	
Tape and glue	
String – 50cm per learner	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What is on the surface of the moon?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

There are craters, rocks and dust on the surface of the moon.

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts).

THE MOON IS SMALLER THAN EARTH

1. The moon might look the same size as Earth in photographs the moon is smaller than the Earth.
2. The diameter of the Earth is about four times the diameter of the moon.
3. The Earth has the right temperature to sutain ife. The temperatures on the moon go from minus 173 °C up to about 100 °C

1. Explain this to the learners as follows:
   a. There are lots of differences between Earth and the moon. It is important to know that life would be impossible on the moon because it has no light, consistent heat, water or air.
   b. The temperatures vary too much for any possible life, from extremely cold to extremely hot.
   c. The surface of the moon is covered in rocks and dust.
3. Give the learners some time to copy the information written on the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. Which is bigger, the Earth or the moon?

b. How hot can it get on the moon?

Answers to the checkpoint questions are as follows:

a. The Earth is bigger than the moon.

b. On the moon, it can get as hot as 100C.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard:

Making a Model of the Earth and the Moon

Instructions:

1. Clear your desks of everything.
2. Collect some newspaper, cardboard and scrap paper.
3. Carefully roll a sheet of newspaper or cardboard into a ball.
4. Roll another sheet around the first ball.
5. Continue until you have made a ball big enough for your Moon.
6. Cover your Moon with a sheet of scrap paper. Tape it down.
7. Paint or colour the ball to look like the Moon.
8. Repeat this process to make an Earth. Remember it needs to be four times bigger than your Moon.
9. Stick a piece of string on each one to hang it from the roof.
10. Remember to clean up after you are finished.

2. Explain this task to the learners as follows:

a. We are going to make models of the Earth and the moon. The instructions are on the board.

b. Please remember to work neatly at all times.

c. You will need to take some newspaper or cardboard to make your models.

d. When you have the right size, you will need to cover the ball in a sheet of paper that you can then colour it to make it the right colour.

e. When you are making your two balls, you need to remember to make one of them (Earth) four times bigger than the other (moon).

f. When you are finished, you need to hang your models up.

g. Please help to clean up the classroom afterwards.

3. Give learners some time to complete this task. Help the learners to hang their models when they are finished.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. How much bigger is the Earth than the moon?
b. Which star is the closest to the moon?

Answers to the checkpoint questions are as follows:

a. The Earth is four times bigger than the moon.
b. The sun is the closest star to the moon.

4. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

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Oxford Successful	The Moon	126
Shuter & Shooter	The Moon	125
Sasol Inzalo Bk B	The Moon	154
Spot On	Features of the Moon	91

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=OjWVtQGwrLU (2 mins) [The Relative Size of the Earth, Moon and Sun: Comparing the size of the Earth to the Sun]

5 C

Term 4, Week 5, Lesson C
Lesson Title: The Sun
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Features of the Moon
CAPS Page Number	29

Lesson Objectives

By the end of the lesson, learners will be able to:

- describe the size difference between the moon and the sun
- generate an investigation of the appearance of the moon over a month

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing	✓	9. Hypothesizing	✓	15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues	✓	12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 12 and 15	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> How much smaller is the moon than the Earth?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *The moon is four times smaller than the Earth.*

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts).

> THE MOON IS CLOSER TO THE EARTH THAN THE SUN
>
> 1. From Earth, the moon and the sun look like they are the same size, but the Moon is 4 times smaller than the Earth and 400 times smaller than the sun.
> 2. The moon rotates very slowly on its own axis. A day is two Earth-weeks long. This means that the part of the moon facing away from the sun is dark and cold for two weeks at a time.
> 3. Light takes about 8 minutes to get from the sun to Earth. It would take only 1 and a half seconds if it were coming from the moon.

2. Explain this to the learners as follows:
   a. The Sun is a very big star. It is much bigger than the Earth and the moon.
   b. The Earth rotates on its own axis. The moon also has its own axis around which it rotates. The Earth takes a day to rotate once, but the moon takes 14 days to rotate once.
3. Show the learners Resource 12, 'Picture of Earth from the Moon'. Explain: We can see that the Earth looks very small. We know that it is not.
4. Ask learners to copy the following questions into their workbooks and answer them:

1. What is the moon made of?
2. Why could a person not live on the Moon?
3. Arrange the moon, the sun and the Earth from biggest to smallest.
4. Why are there still footprints from the astronauts on the Moon?

5. Give learners some time to answer the questions.

1. *The Moon is made of rock.*
2. *A person could not live on the Moon. There is no air to breathe. It is too hot and too cold, there is no water or food.*
3. *Sun, Earth, moon*
4. *There are still footprints from the Astronauts because there is no air and so no wind to disturb them.*

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. Does the moon rotate on its own axis?
b. How many days does it take the moon to rotate on its own axis?

Answers to the checkpoint questions are as follows:

a. Yes, the moon does rotate on its own axis.
b. It takes 14 days for the moon to rotate on its own axis, once.

E CONCEPTUAL DEVELOPMENT

1. Draw and write the following on the chalkboard (try to do this before you teach the lesson):

1	2	3				

1. Turn to a clean page in your book.
2. With a ruler, carefully divide your page into 35 squares – 7 columns across, and 5 rows down.

3. The grid you draw should fill one full page.
4. Put today's date in the top left corner of the first box, e.g. 4 November.
5. Each night you must go outside and look at the shape of the moon and draw it in the next box. Remember to put the date with your picture.
6. Look carefully at the surface of the moon, do you see any dark parts. Add them to your drawing.
7. On a new moon, you will not be able to see anything. On a cloudy evening, you will not see the moon. Only draw what you see.
8. Keep bringing your book to school to compare with your friends.

2. Explain this task to the learners as follows:
   a. In order to understand the changing moon that we see every night, we are each going to keep a moon chart to track the changes in the moon over the next 5 weeks.
   b. Look at the instructions on the board. Carefully copy them down so that you know what to do when you are at home.
   c. On the next open page, draw your moon chart. There are 35 blocks that you will fill in over the next 5 weeks with your drawings of the moon.
   d. Your collection of drawings is called data. You are collecting data to discuss later in the term.
3. Give learners some time to copy the activity from the chalkboard into their workbooks.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. How much wind is there on the moon?
b. Why do astronauts have to wear big, bulky spacesuits when they are on the moon?

Answers to the checkpoint questions are as follows:

a. There is no air on the moon, and so no wind.
b. There is no air and they would not be able to breathe, the suits supply them with air to breathe.

4. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	The Moon	223
Study & Master	The Moon	158
Day by Day	The Moon	163
Platinum	The Moon	176
Viva	The Moon	153
Oxford Successful	The Moon	126
Shuter & Shooter	The Moon	125
Sasol Inzalo Bk B	The Moon	154
Spot On	Features of the Moon	91

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=kJkVegBsNyE (4 mins) [The Secret of the Dark Side of the Moon: about the part of the Moon we cannot see]

6 A

Term 4, Week 6, Lesson A
Lesson Title: Seeing the Moon
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Phases of the Moon
CAPS Page Number	29

Lesson Objectives

By the end of the lesson, learners will be able to:

- Describe why the Moon looks so bright
- Explain why we can only see the part of the Moon the Sun shines on

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing	✓	8. Predicting	✓	14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 14	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> In 50 years time, do you think the footprints of the astronauts will still be on the Moon?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *Yes, the footprints will still be on the Moon. There is no air and no wind to blow them away.*

D ACCESSING INFORMATION

1. Write / draw the following table onto the chalkboard (always try to do this before the lesson starts):

> The Sun's light shines on the Moon
>
> 1. The moon revolves around the Earth every four weeks.
> 2. Although it does not have any light of its own, it shines because it is reflecting light from the Sun.
> 3. The Moon is always the same round shape, but the part of the Moon that is facing away from the Sun is so dark we cannot see it.
> 4. During its journey different parts of the Moon reflect sunlight towards the Earth.
> 5. If the Moon moves between the Sun and the Earth and completely blocks out the Sun, it is called a **solar eclipse**.
> 6. If the Earth moves completely between the Sun and the Moon and the Moon cannot reflect the sunlight, it is called a **lunar eclipse**.

2. Explain this to the learners as follows:
   a. The Moon does not have any of its own light, we see the Moon as bright and shiny because of the reflection of sunlight.
   b. But sometimes the Moon is nearer the Sun than the Earth and the reflection of sunlight is going back toward to Sun, we don't see any of it on Earth.
   c. The Moon moves around the Earth and so we see different parts of the Moon uncovered at different phases.
3. Give learners some time to copy this information into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. How long does it take the Moon to revolve around the Earth?

b. The different shapes of the Moon that we can see are called?

Answers to the checkpoint questions are as follows:

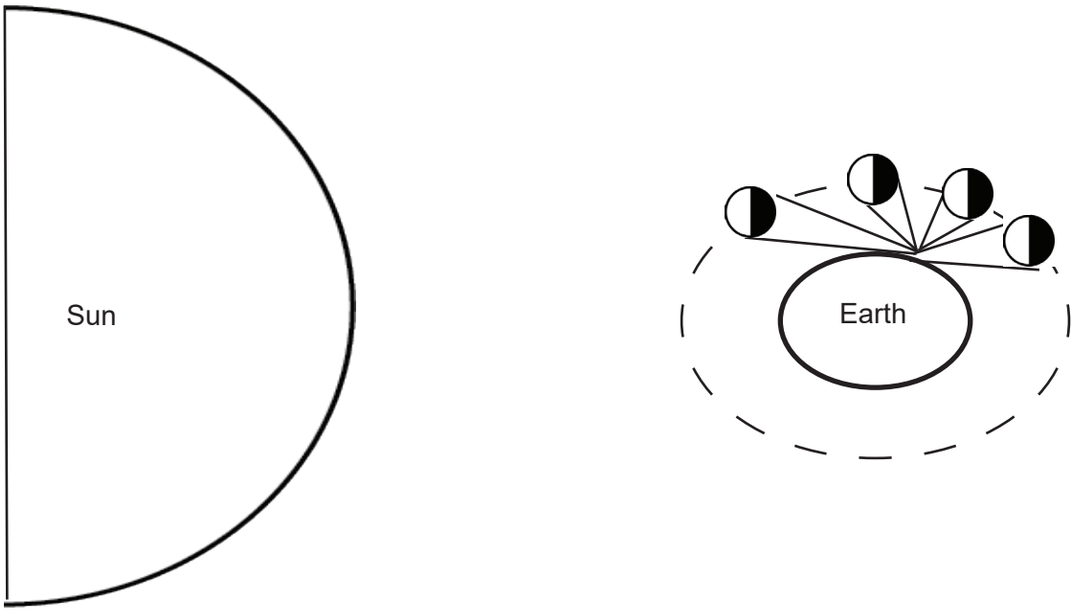
a. It takes the Moon about four weeks to revolve around the Earth.

b. The different shapes of the Moon that we can see are called the phases of the Moon.

E CONCEPTUAL DEVELOPMENT

1. Write the following flow chart onto the chalkboard.

HOW A PERSON ON THE EARTH SEES THE MOON AT FOUR DIFFERENT PHASES.



2. Explain this task to the learners as follows:

a. Look at the picture. The person standing on the Earth sees different parts of the Moon depending where the Moon is. If the Moon is near the Sun, the person will see a completely dark Moon. If the Moon is on the other side of the Earth, the person will see the whole Moon as it will be facing both him and the Sun.

b. Give learners some time to copy this picture in their workbooks.

c. Ask the learners to turn to their Moon Charts in their workbooks. Ask the learners to discuss their progress with drawing the Moon. If anyone has not been able to draw a Moon each night, they can ask one of their friends for help.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Does the moon change shape when it moves around the Earth?
b. What is a lunar eclipse?

Answers to the checkpoint questions are as follows:

a. No, the Moon stays the round shape.
b. lunar eclipse occurs when the Earth moves in front of the Moon and blocks out it's sunlight.

3. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Phases of the Moon	228
Study & Master	Phases of the Moon	160
Day by Day	Phases of the Moon	165
Platinum	Phases of the Moon	180
Viva	Phases of the Moon	155
Oxford Successful	Phases of the Moon	128
Shuter & Shooter	Phases of the Moon	126
Sasol Inzalo Bk B	Phases of the Moon	160
Spot On	Phases of the Moon	92

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

6 B

Term 4, Week 6, Lesson B
Lesson Title: Phases of the Moon
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Seeing the moon
CAPS Page Number	29

Lesson Objectives

By the end of the lesson, learners will be able to:

- identify and describe the various phases of the moon
- recognise the prevalence of the lunar cycle

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing	✓	8. Predicting		14. Designing	
3. Comparing	✓	9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 16	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> Why can't people on Earth always see the moon?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *For a few days each month, the Moon is closer to the Sun than the Earth. There is no sunlight reflecting off the Moon toward Earth. The moon is still there, but dark.*

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts).

> THE PHASES OF THE MOON
>
> 1. When we cannot see the moon at all it is called a **new moon**.
> 2. A few nights later the moon will be **crescent shaped**. This is called the first quarter.
> 3. A few more nights later, when the Moon is almost full, it is called Gibbous.
> 4. When the moon is a complete circle it is called a **full moon**.
> 5. The moon then becomes gibbous again, becoming smaller until it is crescent shaped again and a few days later you cannot see it again.
> 6. This **lunar cycle** takes about a month.

2. Explain this to the learners as follows:
   a. The lunar cycle of the moon takes about a month or 29 days.
   b. We need to know that the moon does not change actual shape, but rather the part of the moon that reflects the light from the sun changes shape.
   c. It starts as a dark shape which we cannot see called a new moon. The light shines slightly on the moon and we see a crescent shape. As more light shines on the moon the shape we can see gets bigger and bigger. When it is about three-quarters it is called a gibbous moon. It then becomes a complete circle which is called a full moon. After that, the shape we can see reflecting at us become smaller again.
3. Give learners some time to copy the information written on the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. How long does a lunar cycle take?

b. What do we call it when we can see the whole moon reflected in the sun's light?

Answers to the checkpoint questions are as follows:

a. A lunar cycle takes about a month

b. A full moon.

E CONCEPTUAL DEVELOPMENT

1. To do this activity, each group will need the following:
   - 8 school desks arranged in an octogon shape; or 8 large boxes; or 8 chairs
   - 8 oranges /tennis balls
   - one large ball
   - prestick
   - matches or toothpicks.
   - black markers or black shoe polish
   - Paper and pens
2. Ensure you have these materials prepared for each group before the lesson starts.
3. Suggestion – wet the matches/ dip them in vaseline so the matches will not burn if the any of the learners are tempted to light the matches.
4. The teacher needs to paint or colour half of each orange/tennis ball black.
5. Tell the learners that they are going to be doing an investigation.
6. Divide the learners into groups (4-6 learners per group) so that each group will have access to the materials.
7. Write the following onto the chalkboard (always try to do this before the lesson starts):

PRACTICAL TASK

1. This practical task will be done in groups 4 - 8 learners per group.
2. Each group will be doing a tasks to explore why the moon changes shape during the different phases of the moon
3. Each person in the group must participate in the investigation and complete the answers to the written activities in their workbooks.
4. Each group will need the following materials and equipment to do the investigation:
    - 8 school desks arranged in an octogon shape; or 8 large boxes; or 8 chairs
    - 8 oranges /tennis balls
    - one large ball
    - prestick
    - matches or toothpicks.
    - black markers or black shoe polish
    - paper and pens
5. You will be working with matches/ toothpicks/ polish. BE CAREFUL AND BE RESPONSIBLE AT ALL TIMES.

8. Read through the practical task with the learners.
9. Remind the learners that the moon takes about 28 days to travel around the Earth.
10. Tell the learners that today they are going to be investigating the phases of the moon.
11. Have each group collect the equipment they will need for the task.
12. Tell the learners that they will have 5 minutes to set up the experiment and then they will be given the tasks to complete.
13. The following will need to be written onto the chalkboard. (Try to do this before the lesson starts):

Experiment set-up

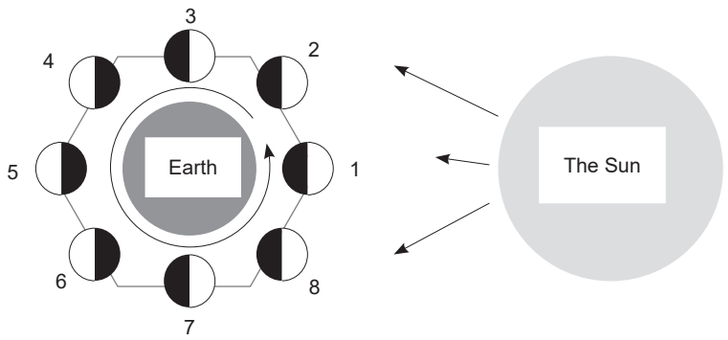
1. Place 8 desks (boxes/chairs) into an octogon shape, around a centre of about a square metre. Place an A4 page in the middle with the word “Earth” on it.
2. Number each desk using a piece of paper, labelled 1 - 8.
3. Take the 8 painted oranges (tennis balls) and place one orange/tennis ball on each desk.
4. Use a small blob of prestick on each desk to keep the orange/tennis ball in place.
5. All the black sides of the oranges must face the same direction.
6. Use prestic to stick a few matches on the big ball making it look like the sun.
7. One learner needs to stand about 1 metre from the octogon facing all the unpainted organge sides, holding the ball representing the sun.
8. Number each desk. Starting with number one nearest to the “Sun”/ball.
9. Move left to 2, move left to 3 and so on until each table has a number

12. Read through the experiment set-up with the learners.
13. Show them a birds eye view of what their group should look like:

Notice that all dark sides

are on the left and

light sides on the right.



14. The teacher must check that the learners have set up their investigation correctly.
15. Ask them if they have any questions.
16. Tell the learners they have 5 minutes to set up the experiment.
17. Supervise the learners whilst they complete the task and answer any questions they may have.
18. After 5 minutes call the learners back to attention.
19. Tell the learners that they are now going to complete task 1.
20. The following will need to be written on the chalkboard:

TOPIC: The Moon

Task 1: (3 marks)

- The aim of this experiment is to see why we think the moon changes shape and explain the phases of the moon.

1.1. What shape of moon do you predict people on Earth will see when the moon is between the sun and the Earth? (Position 1).

1.2. What do you predict people will see when the Earth is between the sun and the moon? (Position 5)

1.3. What do we call the one month of phases of the moon?

21. Read through task 1 with the learners.

22. Ask them if they have any questiwons.

23. Tell the learners they have 5 minutes to answer these questions in their workbooks.

24. Supervise the learners whilst they complete the task and answer any questions they may have.

25. After 5 minutes call the learners back to attention.

26. Tell the learners that they are now going to complete Task 2.

27. The following will need to be written on the chalkboard:

Task 2: (12 marks)

2.1. Draw the following table into your workbooks:

Position	**The name of the phase of the moon.**	**Draw the shape of the moon that we will see from Earth.**
1		
2		
3		
4		
5		
6		
7		
8		

- Each group member must have a turn to kneel or sit in the position of Earth in the middle of the Octogon.
- Learners should be eye level with the oranges/balls.
- The learners can work in pairs in the middle of the octogon.
- Each group member must move from Position 1 to Position 8 in an anticlock wise direction.
- Look carefuly at how much of the orange/ball has not been blackened.
- And record the shape of the moon at each phase.

2.2. Why can we see a “Full Moon”?

- Now use the following words to name each phase of the moon.

  New Moon; waxing cresent;first quarter, waxing gibbous,Full moon; Waning gibbous, Last quarter, Waning cresent.

2.3. Estimate how long each moon phase lasts. Consider the length of a lunar cycle and the number of phases.

2.4. Conclusion:

Complete this sentence: The Moon doesn't emit (give off) light itself, the 'moonlight' we see is actually the light reflected off the _____ surface. So, as the Moon _____ the Earth, the Sun _____different parts of it, making it seem as if the Moon is changing shape.

28. Read through task 2 with the learners.
29. Ask them if they have any questions.
30. Tell the learners they have 15 minutes to complete task 2.
31. Tell learners that each person in the group must record their individual answers in their workbooks for assessment.
32. Supervise the learners whilst they complete the task and answer any questions they may have.
33. After 15 minutes call the learners back to attention.
34. Tell the learners to return all equipment and to tidy their work areas.
35. Collect books for assessment.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Phases of the Moon	228
Study & Master	Phases of the Moon	160
Day by Day	Phases of the Moon	165
Platinum	Phases of the Moon	180
Viva	Phases of the Moon	155
Oxford Successful	Phases of the Moon	128
Shuter & Shooter	Phases of the Moon	126
Sasol Inzalo Bk B	Phases of the Moon	160
Spot On	Phases of the Moon	92

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=NCweccNOaqo (7 mins) [Lunar Cycle: The Phases of the Moon]

6 C

Term 4, Week 6, Lesson C
Lesson Title: The Moon in our Cultures
Time for lesson: 1½ hour

A POLICY AND OUTCOMES

Sub-Topic	Moon Stories
CAPS Page Number	29

Lesson Objectives

By the end of the lesson, learners will be able to:

- recognise the value of knowing stories of the moon from other cultures
- formulate their own story of the moon

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	✓

SCIENCE PROCESS SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing	✓	8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Pictures of the moon	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> What is a waning gibbous moon?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *A waning gibbous moon is when the moon is just less than full size and is getting smaller.*

D ACCESSING INFORMATION

1. Write the following onto the chalkboard (always try to do this before the lesson starts).

> THE MOON IN STORIES
>
> The stories people told about the moon tried to explain what the moon was and why it looked the way it did.
>
> Think about:
>
> 1. Who are the main people in each story?
> 2. How important was the Moon in the story?
> 3. What part did the Moon have?

2. Explain this to the learners as follows:
   a. Many cultures have different stories about the Moon. This tells us that the moon plays an important part in people's lives.
   b. I am going to read a few stories to you. Listen carefully so you can answer the questions.
3. Ask learners to get into a comfortable listening position and pay attention to the stories.
4. Read the following stories to the learners. Between stories ask the learners to think about their answers to the questions on the chalkboard. Discuss their answers.

TOPIC: The Moon

A story from Europe

In Europe, the full moon reminded people to plant crops. People believed that the time of the full moon was a time of fertility. This is also why many couples got married only during full moon. It is brighter during full moon, so this is when harvesting took place. The bright moonlight helped the farmers to harvest into the night. The full moon is sometimes still called the Harvest Moon.

A story from the San people

The San people believed that the moon was a man who did something to make the sun angry. As a punishment, the sun slowly sliced pieces off the moon with its sharp rays. Every time there was just a thin slice of the moon left, the moon would beg the sun for mercy. The sun would let the moon grow big again. As soon as the moon was his full size again, the sun would start to slice pieces off h again.

A story of the Sotho, Venda and Tswana people

When the Moon is a crescent shape, it is called Nwedzana. According to legend, it is a sign of good luck when the horns of Nwedzana point up. The waxing crescent moon, Nwedzana, is a sign of good luck because it could keep disease away from the people. When the horns of Nwedzana are tipped down, however, the people believed that the moon becomes a bowl that pours illness over the world. The waning crescent moon is the sign of bad luck Nwedzana.

A story from the Inuit people of Greenland

Annigan, the Moon god, chases his sister, Malina, the Sun goddess across the sky. But as he does so, he forgets to eat, so he gets much thinner. This is symbolic of the phases of the Moon.

A story of the Algonquian tribes of Native Americans

The full moon in January is called the Wolf Moon. It is named after the hungry packs of wolves that howled at night. These people have many different names for the Full Moon through the year, reflecting their connection with nature and the seasons of hunting, fishing and farming.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. Why are there so many stories about the moon?
b. Are any stories wrong?

Answers to the checkpoint questions are as follows:

a. There are so many stories about the moon, because the moon in important to every culture.
b. No, there are no wrong stories, there are just different stories.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard:

> 1. Which story did you like the most?
> 2. What part of the story made this story your favourite?
> 3. Write a short story of 3 or 4 sentences of your own about the moon.

2. Explain this task to the learners as follows:
   a. We need to appreciate that there are many different cultures in the world and they all have different stories for the same thing.
   b. There are many ways to look at something. People can learn about other cultures by listening to their stories.
   c. Write down the questions from the chalkboard into your workbooks, and then answer the first two questions. Take a little time to think about your own story about the moon. Use your imagination. Now write your own story. When you are done, read it to a friend.
3. Give learners some time to copy the information from the chalkboard into their workbooks.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What do we call it when we see a thin slice of the moon?
b. What do we call it when we cannot see the moon at night?

Answers to the checkpoint questions are as follows:

a. A thin slice of the moon is called a crescent moon.
b. It is called a new moon when we cannot see the moon at night.

4. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Moon Stories	231
Study & Master	Moon Stories	164
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Viva	Moon Stories	160
Oxford Successful	Moon Stories	132
Shuter & Shooter	Moon Stories	130
Sasol Inzalo Bk B	Moon Stories	164
Spot On	Moon Stories	94

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.windows2universe.org/mythology/planets/Earth/moon.html Myths about the Moon
2. http://worldstories.org.uk/stories/why-the-sun-and-moon-live-in-the-sky/ Story about the Sun and the Moon

TOPIC OVERVIEW:
Rocket Systems
Term 4, Weeks 7A – 8C

A. TOPIC OVERVIEW

TERM 4, WEEKS 7A – 8C

- This topic runs for 2 weeks.
- This topic counts for 10% in the end of year final exam.
- It is presented over 6 lessons.
- This topic's position in the term is as follows:

LESSON	WEEK 1			WEEK 2			WEEK 3			WEEK 4			WEEK 5		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

LESSON	WEEK 6			WEEK 7			WEEK 8			WEEK 9			WEEK 10		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C

B. SEQUENTIAL TABLE

GRADE 3 Foundation Phase	GRADE 4	GRADE 5 & 6
LOOKING BACK	**CURRENT**	**LOOKING FORWARD**
• Space • Space travel	• Modelling a rocket • Use of rockets • Rockets as systems to propel vehicles into space	• Systems to explore the moon and Mars • Vehicles used in space

C. SCIENTIFIC AND TECHNOLOGICAL VOCABULARY

Ensure that you teach the following vocabulary at the appropriate place in the topic:

	TERM	EXPLANATION
1.	rocket	Tall, thin structure that can be propelled into space.
2.	gravity	The force that pulls everything towards the Earth.
2.	spacecraft	Machines that are used for space travel and space exploration.
4.	module	A part of the spacecraft which can operate by itself, often away from the spacecraft.
5.	system	A group of things that work together to do a task.
6.	propel	To move or push something forwards.
7.	exhaust	Waste gasses that are sent out from a machine while it is being used.
8.	launch	To send something into the air.
9.	vehicle	A machine that is used to carry people of things from one place to another.
10.	space shuttle	A spacecraft that can land like an aeroplane, used to make journeys between Earth and Earth's orbit.

D. UNDERSTANDING THE USES / VALUE OF SCIENCE

Engineers would be involved in designing special vehicles to travel in space. Astronauts would have to practice driving on Earth in their Astronaut Suits to test the vehicles before they could be used on the Moon.

E. PERSONAL REFLECTION

Reflect on your teaching at the end of each topic:

Date completed:	
Lesson successes:	
Lesson challenges:	
Notes for future improvement:	

7 A

Term 4, Week 7, Lesson A
Lesson Title: Rockets!
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Modelling a rocket
CAPS Page Number	29

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain what a rocket is and how it launches into space
- explain why people want to go to space

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 17, 18 and 19	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> Can people live on the moon?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> *People cannot live on the moon because there is no air or water.*

D ACCESSING INFORMATION

1. Write the following table onto the chalkboard (always try to do this before the lesson starts):

> TRAVELING TO SPACE
>
> 1. Man has been travelling to space for over 50 years. Earth's **gravity is** so strong that a rocket is needed to go up very quickly away from Earth.
> 2. The first man to walk on the moon was Neil Armstrong in July 1969. He travelled with two other astronauts on the rocket Apollo 11.
> 3. Humans have only landed on the moon 6 times.
> 4. A rocket is a **system** used to get **vehicles** into space.

2. Explain this to the learners as follows: (use the poster to help you show the learners the parts of the rocket.)
   a. To get into space, you need a very special type of rocket and lots of fuel.
   b. In the early days of space travel, the missions were to explore the moon. Now people go to space to do explore how we could live in space if we needed to.
   c. Many rockets have been launched to deliver spacecraft into space to do certain jobs. These have been unmanned, meaning no people went up. Everything was controlled by people on Earth.
   d. Space shuttles were used to take astronauts up into space and then land again on Earth like an aeroplane. They did not go to the moon.
   e. The International Space Station is a spacecraft where astronauts do experiments and research how man could live in space. Mark Shuttleworth was the first person from Africa to travel into space when he went to the International Space Station.

3. Show the learners Resource 17, 18 and 19. Discuss the different shapes of the rockets with the learners. Look at the fire and smoke coming from under the rocket. Ask the learners what they think that could be?
4. Give learners some time to copy the information from the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What is a rocket?
b. What does the rocket need lots of fuel to go into space?

Answers to the checkpoint questions are as follows:

a. A rocket is a system used to get vehicles into space.
b. A rocket needs lots of fuel to get into space.

E CONCEPTUAL DEVELOPMENT

1. Write the following questions on the chalkboard (try to do this before the lesson starts):

ROCKETS

1. What shape is the top of the rocket?
2. What shape are the sides of the rocket?
3. How do you think the shape of the top and the side of the rocket helps the rocket get into space?
4. Where is the fuel kept in the rocket?

2. Explain this task to the learners as follows:
   a. The giant Saturn rocket that launched the astronauts on their journey was the largest rocket ever built. The Command Module, where the Astronauts were for the whole trip was not bigger than a car.
   b. It took them three days to get to the moon, and three days to get back to earth
   c. The Command Module landed in the sea, and the ground crew fetched them.
   d. The Lunar Module took the two astronauts to the moon's surface. When they landed they had to put on special spacesuits so they could survive outside the spacecraft. They collected rocks and dust to bring back to earth for scientists to study.
3. Tell the learners to answer the questions from the chalkboard in their workbooks.
4. Give the learners some time to complete this task in their workbooks.
5. Write the model answers on the chalkboard:

1. *The top of the rocket is a cone shape.*
2. *The sides of the rocket are mostly straight.*
3. *The shape of the rocket helps air to flow across the surface and not get in the way.*
4. *The fuel is kept in special tanks inside the body of the rocket.*

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What do rockets take into space?
b. Why are rockets so big and tall?

Answers to the checkpoint questions are as follows:

a. Rockets take people, other spacecraft, machines and supplies into space.
b. Rockets are big and tall to store all the fuel that is needed.

5. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Rocket Systems	235
Study & Master	Rocket Systems	166
Day by Day	Rocket Systems	171
Platinum	Rocket Systems	187
Viva	Rocket Systems	164
Oxford Successful	Modelling a rocket	134
Shuter & Shooter	Rocket Systems	132
Sasol Inzalo Bk B	Rocket Systems	134
Spot On	Space Exploration	96

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.nasa.gov/mission_pages/station/main/index.html [International Space Station]
2. https://www.youtube.com/watch?v=3mt9znatmyQ (4 mins) [Apollo 11 Launch: the rocket that sent up the first people to walk on the moon]
3. https://www.youtube.com/watch?v=OnoNITE-CLc (4 mins) [Space shuttle launch]

7 B

Term 4, Week 7, Lesson B
Lesson Title: Investigating Rockets
Time for lesson: 1½ hour

A POLICY AND OUTCOMES

Sub-Topic	Modelling a Rocket
CAPS Page Number	29

Lesson Objectives

By the end of the lesson, learners will be able to:

- explain how a rocket moves
- explain how the engine in a rocket works

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	✓
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing	✓	8. Predicting		14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations	✓	16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues	✓	12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 17, 18 and 19	
Balloon	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

What does a rocket need to get into space?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

A rocket needs lot of fuel to get into space.

D ACCESSING INFORMATION

1. Write the following table onto the chalkboard (always try to do this before the lesson starts):

HOW DO ROCKETS MOVE?

1. Rockets are much faster and more powerful than aeroplanes.
2. They can travel at 34 000 kilometres per hour.
3. A rocket can only take off when a blast of energy forces it to move. Gasses shoot out of the back of the rocket, propelling it off the ground and into the air.
4. The push off the ground is called thrust.
5. When a rocket takes off we say it is launched.

2. Explain this to the learners as follows:
   a. To escape the gravity on Earth, rockets need to be very powerful and be able to fly very quickly.
   b. The action of gasses rushing out of the bottom of the rocket creates a pushing force on the rocket itself. Gas going backwards, makes the rocket go forwards. The quicker the gas comes out, the quicker the rocket will move forward.
3. Show the learners Resource 17, 18 and 19. Ask the learners to see how much gas is coming out the bottom of the rockets in the pictures.
4. Give learners some time to copy this information into their exercise books.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. How do satellites get into space?

b. What is thrust?

Answers to the checkpoint questions are as follows:

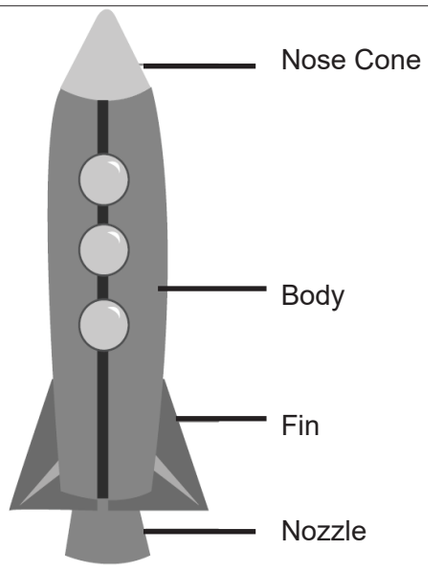
a. Satellites are taken up to space by rockets.

b. Thrust is the push off of the ground.

E CONCEPTUAL DEVELOPMENT

1. Draw and label the following onto the chalkboard:

A Rocket



2. Explain this task to the learners as follows:
   a. Look at the parts of the rocket.
   b. Inside the body of the rocket is where the engine is to make all the gas that the rocket needs to move.
   c. When the rocket fuel is burned inside the engine of a rocket, the fuel gives off gasses. These are called exhaust gasses and are forced out the bottom of the rocket.
3. Ask the learners to draw the picture of a rocket in their workbooks. They should label their drawings.
4. Give learners some time to complete this task in their workbooks.
5. As a demonstration, blow up a balloon for the learners to see, do not tie the end. The air inside the balloon is like the gas inside a rocket. It wants to come out. Show the learners the opening of the balloon. This is like the nozzle on a rocket. The air will be forces out of the opening.
6. Let the balloon go. Watch how it flies around the classroom. The air coming out backwards is forcing the balloon to move forwards.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. Where does the gas get pushed out of the rocket?

b. How fast can a rocket go?

Answers to the checkpoint questions are as follows:

c. The gas gets pushed out of the nozzles at the bottom of the rocket.

d. A rocket can go 34 000 kilometres per hour.

7. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Rocket Systems	235
Study & Master	Rocket Systems	166
Day by Day	Rocket Systems	171
Platinum	Rocket Systems	187
Viva	Rocket Systems	164
Oxford Successful	Modelling a rocket	134
Shuter & Shooter	Rocket Systems	132
Sasol Inzalo Bk B	Rocket Systems	134
Spot On	Modelling a rocket	98

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.youtube.com/watch?v=ebhOnf65N9Q (2 mins) [How do rockets work?: an explanation]
2. https://www.nasa.gov/exploration/systems/sls/rocket.html [A new space rocket system from NASA]

7 C

Term 4, Week 7, Lesson C
Lesson Title: Design a Rocket
Time for lesson: 1½ hour

A POLICY AND OUTCOMES

Sub-Topic	Modelling a rocket
CAPS Page Number	29

Lesson Objectives

By the end of the lesson, learners will be able to:

- write a basic design brief, specifications and constraints
- sketch design ideas
- apply existing knowledge to solve problems

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	✓

SCIENCE PROCESS SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting	✓	14. Designing	✓
3. Comparing		9. Hypothesizing	✓	15. Making/ constructing	
4. Measuring		10. Planning Investigations	✓	16. Evaluating and improving products	✓
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues	✓	12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 23 and 25	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

> What happens when air comes out of the end of a balloon.

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

> The air moving backwards out of the balloon forces the balloon to move forwards.

D ACCESSING INFORMATION

1. Write the following table onto the chalkboard (always try to do this before the lesson starts):

> MY ROCKET DESIGN
>
> Design Brief:
> I will design and make a _____ that will be able to travel _____ in the air.
>
> Specifications:
> The rocket must be able to travel forward at least 3 metres.
> We must be able to reuse the rocket.
> We will move the rocket with air.
>
> Constraints:
> The rocket must be built in class.

2. Explain this to the learners as follows:
   a. A design brief is a sentence saying what you are going to design and make.
   b. Learners must complete the sentence.
   c. Specifications tell you what the balloon rocket must have and be able to do.
   d. Constraints are things you have to do.
3. The Learners need to consider the following:
   a. What shape will the rocket be?
   b. What materials are you going to need to make the rocket?
4. Give learners some time to copy this information into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What will you be using to make your rocket move?
b. What must your rocket be able to do?

Answers to the checkpoint questions are as follows:

a. Air
b. Travel at least 3 metres

E CONCEPTUAL DEVELOPMENT

1. Show the learners Resource 23 and 25 for ideas.
2. Go over the following concepts with the learners before they start sketching their rockets:
   a. Rocket must be powered by air.
   b. Rockets must be able to travel at least 3 metres in the air.
   c. Rockets must be able to be used again.
3. Write the following onto the chalkboard (always try to do this before the lesson starts):

   1. Draw a sketch that includes:
      a. The rocket that you will make
      b. The part where the air will go
      c. Labels for the parts of the rocket
      d. A title with the name of your rocket and whether it is a puffer rocket or a balloon rocket.
   2. Make a list of the materials you will use to make your rocket.

4. Explain this task to the learners as follows:
   a. Each learner must make a sketch of their idea for a rocket.
   b. This sketch must include:
      a. The part of the rocket where the air will go
      b. Labels to explain the parts of the rocket
      c. A title with the name of your rocket and whether it is a puffer rocket or a balloon rocket.
   c. Each learner must make a list of materials that they will need to make the rocket.
5. Give learners some time to complete this sketch and the list of materials in their work-books.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What is a specification?

b. Where must your rocket be built?

Answers to the checkpoint questions are as follows:

a. Specifications will tell you what the rocket must have and what it must be able to do.

b. The rocket must be built at school during class.

6. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	How a rocket works	240
Study & Master	Making a rocket model	173
Day by Day	Modelling a rocket	171
Platinum	Make a model	192
Viva	Modelling a rocket	170
Oxford Successful	Modelling a rocket	135
Shuter & Shooter	Modelling a rocket	135
Sasol Inzalo Bk B	Investigate balloon rockets	141
Spot On	Modelling a rocket	100

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. http://www.wikihow.com/Make-a-Paper-Rocket [How to make a puffer rocket]
2. http://www.wikihow.com/Make-a-Rocket [How to make a balloon rocket]

8 A

Term 4, Week 8, Lesson A
Lesson Title: Making a Rocket
Time for lesson: 1½ hour

A POLICY AND OUTCOMES

Sub-Topic	Modelling a rocket
CAPS Page Number	29

Lesson Objectives

By the end of the lesson, learners will be able to:

- choose appropriate materials
- make a rocket
- make the rocket fly

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing		8. Predicting	✓	14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	✓
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	
6. Identifying problems & issues	✓	12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Resource 23, 24 and 25	
Balloons	
Scrap Paper	
Tape	
Straws	
Fishing line – to tie between two points	
Scissors	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

How far does your rocket have to travel?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

The rocket must travel at least 3 metres.

D ACCESSING INFORMATION

1. Write the following table onto the chalkboard (always try to do this before the lesson starts):

MAKING A ROCKET

1. Before you start your rocket, make sure you:
   - Have your sketch for your rocket
   - Have your list of materials
   - Gather materials according to this list
2. After you make your rocket, make sure you:
   - test your rocket and improve
   - tidy up the space where you worked

2. Read through the list on the board with the learners to make sure they understand the planning before they start making their rockets.
3. Show the learners Resource 23, 24 and 25 so that they can see examples of model rockets.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What does a materials list have on it?
b. How will the air make your rocket move forward?

Answers to the checkpoint questions are as follows:

a. A materials list has the names of the different things you will need to make your model.
b. The air will propel or push the rocket forward.

E CONCEPTUAL DEVELOPMENT

1. Write the following onto the chalkboard (try to do this before the lesson starts):

CHECKLIST:

1. Have you collected all of the materials you will need to make your rocket before you start?
2. Have you got your design sketch in front of you?
3. Did you observe the safety rules? No running, no shouting, hold scissors downwards when walking.
4. Did you test your rocket to see if it needs improvements?
5. Have you put your rocket in a safe place for the next lesson?
6. Have you tidied up the area where you worked?

2. Explain this task to the learners as follows:
   a. You will need to make a rocket.
   b. When making your model, learners must observe safety rules: no running, no shouting, hold scissors downwards when walking.
   c. Go through the checklist on the chalkboard.
   d. Tell the learners not to waste materials.
3. Give learners enough time to make and test their rockets.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. What are the safety rules?
b. Why is your design sketch important?

Answers to the checkpoint questions are as follows:

a. No running, no shouting, hold scissors downward when walking.
b. It tells you what you are making.

4. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	How a rocket works	240
Study & Master	Making a rocket model	173
Day by Day	Modelling a rocket	171
Platinum	Make a model	192
Viva	Modelling a rocket	170
Oxford Successful	Modelling a rocket	135
Shuter & Shooter	Modelling a rocket	135
Sasol Inzalo Bk B	Investigate balloon rockets	141
Spot On	Modelling a rocket	100

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

8 B

Term 4, Week 8, Lesson B
Lesson Title: Testing the Rockets
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Modelling a rocket
CAPS Page Number	29

Lesson Objectives

By the end of the lesson, learners will be able to:

- measure distance
- record observations

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	✓
2. Observing	✓	8. Predicting	✓	14. Designing	
3. Comparing		9. Hypothesizing		15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Fishing line – to tie between two points	A piece of string that measures a metre, with marks measuring ½ m, ¼ m and ¾ m
Measuring tape – at least 6m or metre stick	
Straws	
Tape	
All of the rockets	

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

Why do we evaluate our rockets?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

So that we can improve them and make the best rocket we can.

D ACCESSING INFORMATION

1. Draw the following table onto the chalkboard and fill in the details (always try to do this before the lesson starts):

Names of Rockets	**Distance the rocket travelled (centimetres)**		
	Launch 1	**Launch 2**	**Launch 3**
Name of my rocket			
Name of my friend's rocket			

1. Did my rocket meet the specifications of the project?
2. Did my rocket go at least three metres?
3. Was my rocket able to be used more than once?

2. Explain this to the learners as follows:
    a. Each rocket will be tested inside the classroom.
    b. Each learner must stand in the launch spot to launch their rocket.
    c. The distance will be measured from the launch spot to the rocket's front when it comes to a stop.
    d. Each learner must record the distance from two rockets only; their rocket and a friend's rocket.
    e. Each rocket will have three launches.
    f. The distance must be recorded in centimetres.
7. Give learners some time to copy the information written on the chalkboard into their workbooks.

Checkpoint 1

Ask the learners the following questions to check their understanding at this point:

a. What measurement are we measuring the distance the rockets travel in?
b. Where is the rocket getting its energy to move?

Answers to the checkpoint questions are as follows:

a. We are measuring in centimetres.
b. The rocket is getting its energy to move from the air put into it.

E CONCEPTUAL DEVELOPMENT

1. Set up the fishing-line by tying one end to a fixed object at the end of the classroom.
2. Set up a dedicated launch spot at the other end of the fishing line. All of the learners must stand in that same spot when launching their rockets, either in the air or along the line.
3. Learners must record their own distances and the distances of one friend in the table in their workbooks.
4. Results must be recorded in centimetres.
5. Give the learners some time to complete this task in their workbooks.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

a. If the rockets were launched outside, what might happen?
b. Why must we be careful to measure all the distances in the same way?

Answers to the checkpoint questions are as follows:

a. If the rockets were launched outside there could be wind affecting flights.
b. So that the process is the same for every rocket flight to make sure it is a fair process.

6. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	How a rocket works	240
Study & Master	Making a rocket model	173
Day by Day	Modelling a rocket	171
Platinum	Make a model	192
Viva	Modelling a rocket	170
Oxford Successful	Modelling a rocket	135
Shuter & Shooter	Modelling a rocket	135
Sasol Inzalo Bk B	Investigate balloon rockets	141
Spot On	Modelling a rocket	100

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

8 C

Term 4, Week 8, Lesson C
Lesson Title: Showing our Rockets
Time for lesson: 1 hour

A POLICY AND OUTCOMES

Sub-Topic	Modelling a Rocket
CAPS Page Number	29

Lesson Objectives

By the end of the lesson, learners will be able to:

- draw a bar graph
- communicate findings to the class

Specific Aims	1. DOING SCIENCE & TECHNOLOGY	✓
	2. KNOWING THE SUBJECT CONTENT & MAKING CONNECTIONS	
	3. UNDERSTANDING THE USES OF SCIENCES & INDIGENOUS KNOWLEDGE	

SCIENCE PROCESS SKILLS					
1. Accessing & recalling Information	✓	7. Raising Questions		13. Interpreting Information	
2. Observing		8. Predicting		14. Designing	✓
3. Comparing	✓	9. Hypothesizing	✓	15. Making/ constructing	
4. Measuring		10. Planning Investigations		16. Evaluating and improving products	✓
5. Sorting & Classifying		11. Doing Investigations		17. Communicating	✓
6. Identifying problems & issues		12. Recording Information	✓		

B POSSIBLE RESOURCES

For this lesson, you will need:

IDEAL RESOURCES	IMPROVISED RESOURCES
Graph paper	Line paper – with ruled columns

C CLASSROOM MANAGEMENT

1. Make sure that you are ready and prepared.
2. Write the following question onto the chalkboard before the lesson starts:

Why did we test each rocket three times?

3. Learners should enter the classroom, then discuss the question with the teacher and answer it in their workbooks.
4. Discuss the answer with the learners.
5. Write the model answer onto the chalkboard.

To make sure the rocket could repeat the distance and to check that it met the specification that each rocket could be reused.

D ACCESSING INFORMATION

1. Write the following table onto the chalkboard (always try to do this before the lesson starts):

PUTTING INFORMATION ON A GRAPH

1. A bar graph is one type of graph
2. It has bars of different heights to show the different measurements.
3. The measurements go along the left side of the graph in centimetres.
4. The objects (launches) being measured go along the bottom line.
5. The graph must have a title.

2. Explain this to the learners as follows:
3. Bar graphs let us see quickly what the distances travelled were.
4. Draw a bar graph for the rocket flights.
5. Give learners some time to copy this information into their exercise books.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

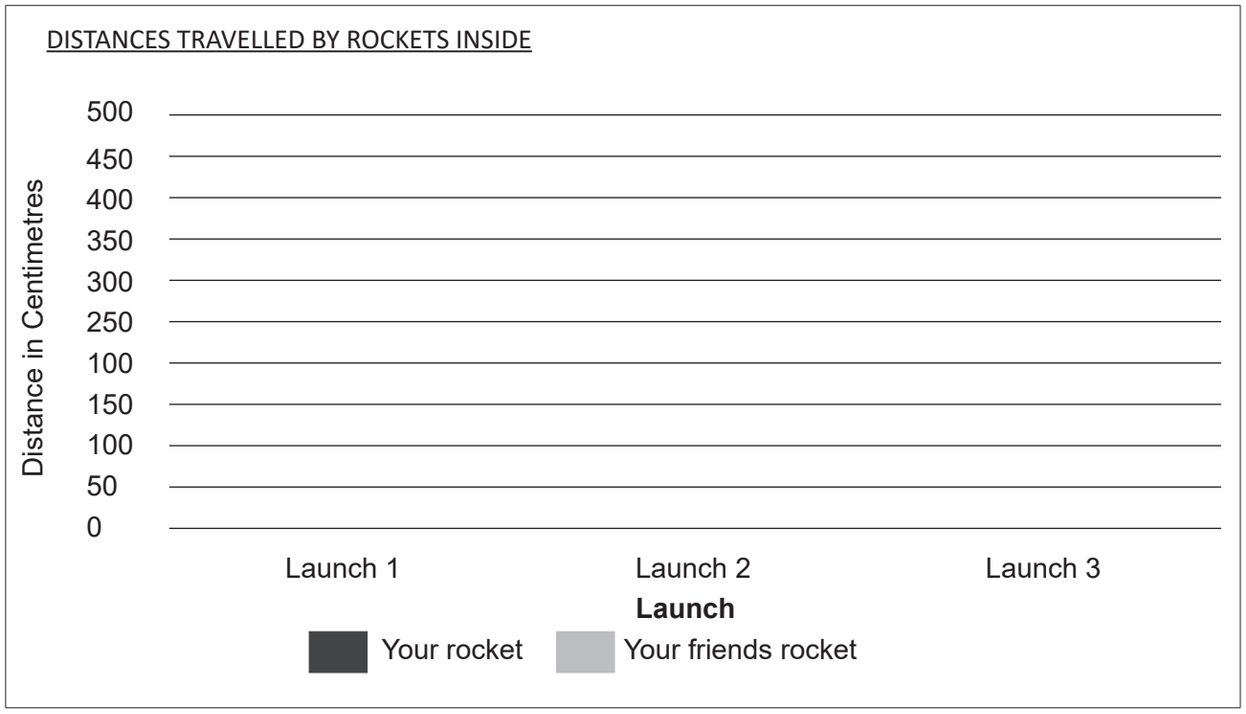
a. What could change the distance the rocket travelled inside?
b. What was your design brief for your rocket?

Answers to the checkpoint questions are as follows:

a. The amount of air put into the rocket to propel it.
b. I will design and make a rocket that will be able to travel 3 metres in the air.

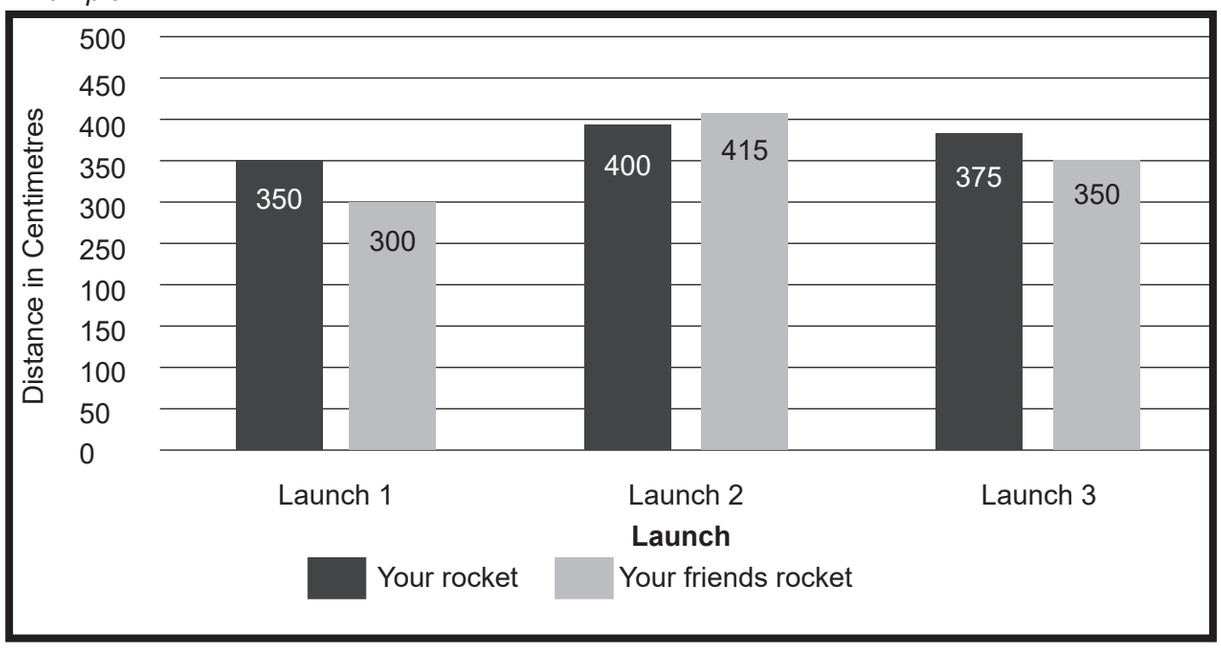
E CONCEPTUAL DEVELOPMENT

1. Draw the following onto the chalkboard:



2. Explain this task to the learners as follows:
   a. You need to draw the bar graph with the correct labels and title as shown on the chalkboard.
   b. Along the left side, write the title 'Distance in centimetres' and place the following numbers starting at the bottom: 0; 50; 100; 150; 200; 250; 300; 350; 400; 450; 500
   c. Along the bottom, write the title 'Launch' and set out each launch attempt: Launch 1; Launch 2; Launch 3. Then choose a colour for you and a different one for your friend.
   d. Give your graph a title: 'Distances Travelled by Rockets Inside'
   e. Fill in your bars as accurately as possible by getting your distances (data) from the table in your workbooks from the last lesson.
   f. Start with the first launch by each rocket.
   g. Leave a gap and do the second launch.
   h. Leave a gap and do the third launch.
   i. Draw a border around the bar graph.

Example:



3. Give learners some time to complete this task in their workbooks.

Checkpoint 2

Ask the learners the following questions to check their understanding at this point:

d. Where does the gas get pushed out of the rocket?

e. How fast can a rocket go?

Answers to the checkpoint questions are as follows:

f. The gas gets pushed out of the nozzles at the bottom of the rocket.

g. A rocket can go 34 000 kilometres per hour.

4. Ask the learners if they have any questions and provide answers and explanations.

F REFERENCE POINTS FOR FURTHER DEVELOPMENT

If you need additional information or activities on this topic, you can find these in your textbook on the following pages:

NAME OF TEXTBOOK	TOPIC	PAGE NUMBER
Solutions for All	Evaluating	249
Study & Master		-
Day by Day	Bar Graph	174
Platinum	Bar Graph	191
Viva		-
Oxford Successful		-
Shuter & Shooter		-
Sasol Inzalo Bk B	Bar Graph	143
Spot On	Modelling a rocket	101

G ADDITIONAL ACTIVITIES/ READING

In addition, further reading, listening or viewing activities related to this sub-topic are available through the following web links:

1. https://www.mathsisfun.com/data/bar-graphs.html [Make a bar graph]

NATURAL SCIENCES & TECHNOLOGY

ASSESSMENT GRADE 4 TERM 4

GRADE 4 ASSESSMENT

- This section presents the CAPS assessment requirements for this grade for this term.
- See your prescribed textbooks for examples of the required assessments.

CAPS Assessment

Assessment is a continuous planned process that involves identifying, gathering, interpreting and diagnosing information about the performance of learners.

Assessment involves generating and collecting evidence of learner achievement and progress, and using this information to understand and provide assistance to the learner during the process of teaching and learning.

Assessment should be both *formal* and *informal*:

a. ***Informal Assessment*** involves regular checking of learners' class work and practical tasks; asking questions; discussions; informal classroom interactions; and giving constructive feedback. Informal assessment marks do not need to be recorded, but the teacher can make notes for future reference.

b. ***Formal Assessment*** provides teachers with a systematic way of evaluating how well learners are progressing. Formal Assessment consists of selected assessment tasks. These tasks are stipulated by CAPS and the marks need to be recorded. These tasks are done throughout the year, and include practical tasks, tests and examinations.

   i. ***Tests and Examinations***

      Examinations must include questions on both Natural Sciences and Technology. The weighting of the marks should reflect the time allocated to each section in the curriculum content. Tests and exams should consist of a range of questions that cover different cognitive levels: recall; understanding; application; evaluation; analysis; and synthesis. CAPS aligned tests and examinations, with accompanying memoranda, are provided with these lesson plans.

   ii. ***Practical Tasks***

      Practical tasks give learners the opportunity to demonstrate knowledge, skills and understanding. Practical tasks form part of the activities included in these lesson plans. Each term, one practical task has been selected for assessment. A rubric is provided to conduct the assessment.

A minimum mark allocation is prescribed in CAPS for tests, practical tasks and examinations for each grade. For this grade, these are summarised in the table below:

GRADE 4 ASSESSMENT

Grade 4						
Programme of Formal Assessment						
Formal Asessments	**TERM 1**	**TERM 2**	**TERM 3**	**TERM 4**	**TOTAL MARKS FOR THE YEAR**	**TOTAL**
School-based assessments	1 test [15 marks] 1 selected practical task [10 marks]	1 exam or test on work from terms 1 & 2 [40 marks] 1 selected practical task [10 marks]	1 test [15 marks] 1 selected practical task [15 marks]	1 selected practical task [15 marks]	120 marks	Together make up 75% of the total marks of the year
Exams [60 minutes]				Exam on work from terms 3 & 4 [40 marks]	40 marks	Makes up 25% of the total marks of the year
Number of formal assessments	2	2	2	2	Total 8 assessments [160 marks]	Total: 100%

Refer to CAPS on the processes for converting marks to percentages and to the 7-point scale.

In this section of the booklet, you will find your science assessments for this term.

There are two assessments included:

A Practical Activity

The activity completed is drawn from one of the lessons in the lesson plans. The rubric or memorandum attached in this pack will assist you with assessing the task completed by the learners.

An Exam

The exam included will need to be copied onto the chalkboard for learners to complete. There is also an exam memorandum included to assist you with marking the learners completed test scripts.

All of the assessments are aligned to CAPS requirements and the marks allocated for each assessment are as stipulated in CAPS.

Natural Sciences & Technology
Grade 4
Practical Task
Term 4

15 marks
Time allocation: 40 minutes (15 minutes preparation, 25 minutes task time)

NOTE TO THE TEACHER:

1. This practical activity will be completed as part of Section E of lesson 6B.
2. This practical will take place during the lesson after the teaching component in Section B, “Accessing Information”.
3. The first 15 minutes will be used to teach section B and prepare learners for the practical task.
4. The next 25 minutes will be used to complete the practical activity as outlined in Section E.
5. The instructions and content of the practical task should be written on the chalkboard for the learners.
6. The memo for assessing the practical task is provided.
7. The learners will be working in groups and will need the following items for each group to complete the tasks:
    - eight school desks arranged in an octagon; or 8 large boxes.
    - 8 oranges /tennis balls. Half painted black and the other half unpainted.
    - one large ball.
    - prestick
    - matches or toothpicks.
    - paper and pens.
8. Ensure that the matches have been damaged by water or Vaseline to prevent the class from lighting matches during the lesson.
9. Draw a birds-eye-view plan of the investigation set-up.
10. Ensure that all the materials have been prepared before the practical lesson. This may take a few days. Allow enough time for this.
11. The learners should complete the drawings with a sharp pencil and the written answers should be completed in pen.
12. The teacher may use a strong torch to assist the learners so understand how the sun shines on part of the moon surface.
13. At the end of the lesson, if possible the oranges should be peeled and eaten rather than thrown away.

GRADE 4

NATURAL SCIENCES & TECHNOLOGY

TERM 4

PRACTICAL TASK MEMORANDUM

(see Section E of Lesson 6B for instructions and questions)

<table>
<tr><th>CAPS Topic</th><th>Task</th><th>Expected answer/outcome</th><th>Marks</th></tr>
<tr><td></td><td>1</td><td></td><td></td></tr>
<tr><td>Phases of the Moon</td><td>1.1</td><td>No Moon or Nothing or No shape</td><td>1</td></tr>
<tr><td>Phases of the Moon</td><td>1.2</td><td>A full moon</td><td>1</td></tr>
<tr><td>Phases of the Moon</td><td>1.3</td><td>Lunar Cycle</td><td>1</td></tr>
<tr><td></td><td>2</td><td></td><td></td></tr>
<tr><td>Phases of the Moon</td><td>2.1</td><td>
<table>
<tr><th>Position</th><th>The name of the phase of the moon.</th><th>Draw the shape of the moon that we will see from Earth.</th></tr>
<tr><td>1</td><td>New Moon</td><td>No moon seen</td></tr>
<tr><td>2</td><td>Waxing Crescent</td><td>  </td></tr>
<tr><td>3</td><td>First Quarter</td><td>  </td></tr>
<tr><td>4</td><td>Waxing Gibbous</td><td>  </td></tr>
<tr><td>5</td><td>Full Moon</td><td>  </td></tr>
<tr><td>6</td><td>Waning Gibbous</td><td>  </td></tr>
<tr><td>7</td><td>Last quarter</td><td>  </td></tr>
<tr><td>8</td><td>Waning Crescent</td><td>  </td></tr>
</table>
The teacher may select any 9 answers on the table above. ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td><td>9</td></tr>
</table>

GRADE 4 ASSESSMENT – PRACTICAL TASK TERM 4 MEMO

CAPS Topic	Task	Expected answer/outcome	Marks
Phases of the Moon	2.2	We can see the full moon as the sun is shining directly on the surface of the moon.	0
Phases of the Moon	2.3	Estimate time 29 days	0
Phases of the Moon	2.4	Conclusion – Complete this sentence: The Moon doesn't emit (give off) light itself, the moonlight we see is actually the light reflected off the lunar/moon ✓ surface. So, as the Moon moves around/orbits ✓ the Earth, the Sun lights up ✓ different parts of it, making it seem as if the Moon is changing shape.	3
			TOTAL 15

GRADE 4
Natural Sciences & Technology
Term 4
Exam

40 Marks
60 Minutes

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.

1.1. 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 Ⓑ

GRADE 4 ASSESSMENT – EXAM TERM 4

SECTION A: Energy and Change & Systems and Control

QUESTION 1: MULTIPLE CHOICE [3]

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

1.1. Which one of these is NOT an example of movement input energy?

a. shaking

b. blowing

c. beating

d. sound

1.2. Which of these statements is FALSE?

a. Energy cannot change from one form to another.

b. Energy is never lost and it cannot be destroyed.

c. The energy that goes into a system is called input energy.

d. The energy that comes out of a system is called output energy.

1.3. Which of the following statements is TRUE?

a. Energy cannot be transferred from one object to another.

b. Energy can be transferred from one object to another.

c. During energy transfer, the energy does not change form.

d. When energy is transferred it is lost.

QUESTION 2 [4]

Write one word that means the same as the sentence:

2.1. Electricity that is made by the movement of water.

_____

2.2. Harmful or annoying levels of noise.

_____

2.3. A measure of how hot or cold something is.

_____

2.4. A sugar substance found in plants as a food.

_____

QUESTION 3 [8]

There are many sources and forms of energy.

3.1. Name two examples of stored energy in nature that could be used for heating.

_____

_____

3.2. Think about sound and light. What makes them similar forms of energy?

_____

3.3. What makes sound and light different from each other?

_____

_____

3.4. Think about what happens in a wood burning fire to help you explain what the following mean:

- input energy
- output energy
- energy transference

_____

_____

_____

QUESTION 4 [5]

"When an object vibrates, it creates a sound wave."

How do these sound waves become sounds that we can hear as words or music?

_____

_____

_____

_____

_____

GRADE 4 ASSESSMENT – EXAM TERM 4

SECTION B: Planet Earth and Beyond

QUESTION 1: MULTIPLE CHOICE [3]

1.1. Which one of these is NOT a gas planet?

a. Venus

b. Saturn

c. Uranus

d. Jupiter

1.2. Which of these statements is FALSE?

a. There is no water on the moon.

b. The moon is covered in craters.

c. The moon takes one year to move around the Earth.

d. There is no atmosphere surroundind the moon.

1.3. Which of the following statements is TRUE?

a. There are 5 continents on planet Earth.

b. Most of the Earth's surface is covered in water.

c. Madagascar is a continent in the Indian Ocean near South Africa.

d. Planet earth looks mostly green from outer space.

QUESTION 2 [4]

Write one word that means the same as the sentence:

2.1. Rocks that travel through space at very fast speeds.

_____

2.2. The force that pulls everything towards the Earth.

_____

2.3. Bodies in space that give off their own light.

_____

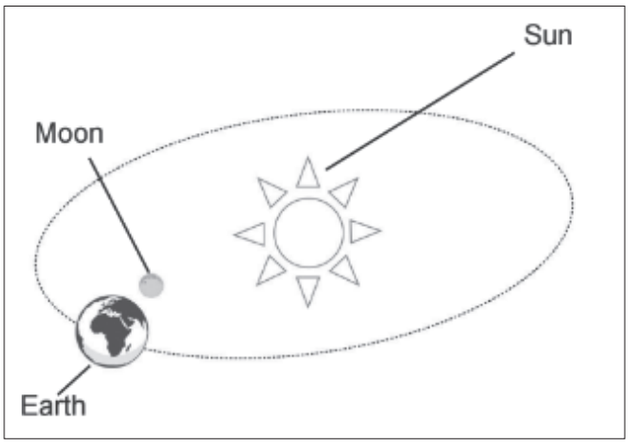
2.4. The layer of gases that surrounds the Earth.

_____

QUESTION 3 [9]

(Note to the educator: Use the diagram below or use Resource 20)

Look at the diagram below and then answer the questions which follow:



3.1. How long does it take the Earth to orbit the sun?

_____

3.2. Explain how day and night happen on Earth.

_____

_____

_____

_____

3.3. Why does the moon sometimes appear full and round and at other times it seems to get smaller?

_____

_____

_____

_____

QUESTION 4 [4]

Elon Musk is the CEO of a company called SpaceX. He was born in Pretoria and went to Pretoria Boys' High School. He plans to send people to Mars by 2024:

> "In 2024 we want to try fly four ships (to Mars). Two cargo and two crew. The goal of these initial missions is to find the best source of water…"

4.1. Name two difficulties that humans face in outer space.

_____

_____

4.2. Elon Musk is an engineer with big dreams. Do you think it will ever be possible for man to live on Mars? Give a reason for yor answer.

_____

_____

TOTAL :40

Grade 4
Natural Sciences & Technology
Term 4
Exam

Memorandum

CAPS Topic	Questions	Expected answer(s)	Marks
PART A: Energy and Change & Systems and Control			
	1		
Energy and change	1.1	D ✓	1
Energy around us	1.2	A ✓	1
Energy around us	1.3	B ✓	1
	2		
Energy around us	2.1	hydroelectric ✓	1
Energy and sound	2.2	noise pollution ✓	1
Energy around us	2.3	temperature ✓	1
Energy and change	2.4	glucose ✓	1
	3		
Energy around us	3.1	(Answers may vary) ✓ ✓ Coal and wood	2
Energy around us	3.2	They are both output energy. ✓	1
Energy around us	3.3	• Light is energy you can see. ✓ • Sound is energy you can hear. ✓	2
Energy around us	3.4	(Any three) ✓ ✓ ✓ • The input energy in a wood fire is the wood. • The wood has stored chemical energy. • Once the fire is lit, the stored energy in the wood is transferred into light and heat energy. • This is the output energy. • If more wood is added, the stronger the output of the fire will be.	3

CAPS Topic	Questions	Expected answer(s)	Marks
	4		
Energy and sound		(Any 5) ✓ ✓ ✓ ✓ ✓ • The sound wave travels to the outside ear and then into the ear canal. • At the end of the ear canal, the sound waves then reach the eardrum. • The sound waves cause the eardrum to vibrate. • This vibration moves tiny bones in the middle of the ear. • These bones then carry vibrations to the inside of the ear to the cochlea. • The cochlea then sends the sound to the brain. • The brain then works out what sounds we are hearing.	5
PART B: Planet Earth and Beyond & Systems and Control			
	1		
The Earth and the sun	1.1	A ✓	1
The moon	1.2	C ✓	1
Planet Earth	1.3	B ✓	1
	2.		
The moon	2.1	meteorite ✓	1
Rocket systems	2.2	gravity ✓	1
The sun	2.3	star ✓	1
Planet Earth	2.4	atmosphere ✓	1
	3.		
The sun	3.1	365 ¼ days (1 year) ✓	1
The Earth and the sun	3.2	(Any 4) ✓ ✓ ✓ ✓ • The Earth spins on its own axis. • It takes the Earth 24 hours to make one full turn. • This rotation causes day and night. • Day is when our side of the sun is facing the sun. • Night is when our side of the Earth is facing away from the sun.	4

CAPS Topic	Questions	Expected answer(s)	Marks
The moon	3.3	(Any 4) ✓ ✓ ✓ ✓ • The moon does not have any light of its own. It shines because it is reflecting the light of the sun. • The moon is always round. It does not change shape. • The moon moves around the Earth. • When the moon is between our place on Earth and the Sun, we cannot see it as it because it is not reflecting sunlight. • As the moon starts to move towards the other side of our place on the earth, it begins to reflect sunlight and we begin to see it – small at first until the whole moon is reflecting sunlight.	4
	4.		
Rocket systems	4.1	(Any two) ✓ ✓ • Lack of gravity • Lack of breathable oxygen • Cold • Lack of protection from the atmosphere	2
Rocket systems	4.2	(Answers will vary) ✓ ✓ • Yes. Technology is improving all the time. Many ears ago, they did not think it was possible to put a man on the moon. If they can find a water source and a way to make the air breathable, I believe it is possible.	2
			TOTAL 40