

**GENERAL EDUCATION &
TRAINING PHASE (GET)
NATURAL SCIENCES
SBA EXEMPLAR BOOKLET
GRADES 4-6**



basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA



FOREWORD



The Department of Basic Education has pleasure in releasing a subject exemplar booklet for School Based Assessment (SBA) to assist and guide teachers with the setting and development of standardised SBA tasks and assessment tools. The SBA booklets have been written by teams of subject specialists to assist teachers to adapt teaching and learning methods to improve learner performance and the quality and management of SBA.

The primary purpose of this SBA exemplar booklet is to improve the quality of teaching and assessment (both formal and informal) as well as the learner's process of learning and understanding of the subject content. Assessment of and for learning is an ongoing process that develops from the interaction of teaching, learning and assessment. To improve learner performance, assessment needs to support and drive focused, effective teaching.

School Based Assessment forms an integral part of teaching and learning, its value as a yardstick of effective quality learning and teaching is firmly recognised. Through assessment, the needs of the learner are not only diagnosed for remediation, but it also assists to improve the quality of teaching and learning. The information provided through quality assessment is therefore valuable for teacher planning as part of improving learning outcomes.

Assessment tasks should be designed with care to cover the prescribed content and skills of the subject as well as include the correct range of cognitive demand and levels of difficulty. For fair assessment practice, the teacher must ensure that the learner understands the content and has been exposed to extensive informal assessment opportunities before doing a formal assessment activity.

The exemplar tasks contained in this booklet, developed to the best standard in the subject, is aimed to illustrate best practices in terms of setting formal and informal assessment. Teachers are encouraged to use the exemplar tasks as models to set their own formal and informal assessment activities.



MR HM MWELI

DIRECTOR-GENERAL

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1. Background and Introduction

This is a framework for the development of School-Based Assessment tasks for Natural Sciences and Technology. Necessarily, this framework draws from the *Curriculum and Assessment Policy Statement (CAPS)* for *Natural Sciences and Technology* (Intermediate Phase); the *National Protocol for Assessment (NPA)*, *Grades R – 12*, the *National Policy Pertaining to the Programme and Promotion Requirements (NPPPPR)*. This document should therefore be read in conjunction with these other policy documents.

Assessment is a critical aspect of curriculum planning (Ogunniyi, 1999:6), and it is one of the most challenging areas in curriculum delivery. Since assessment is an integral part of teaching and learning, it is important to understand the nature of Natural Sciences as a subject. The nature of the Natural Sciences subject determines how it should be taught and learnt and thus assessed.

The teaching and learning of Natural Sciences seeks to achieve three Specific Aims as outlined in the CAPS – *Doing Science*, *Construction of Knowledge* and *Science, Technology and Society*. These aims are achieved through the development of *Science and Technology Process Skills*.

2. Assessment in Natural Sciences and Technology

In this framework assessment is conceptualised from the assumption of how teaching and learning should be taking place in Natural Sciences and Technology. This conceptualisation is outlined in the Curriculum and Assessment Policy Statement of the subject. Assessment in this framework assumes that learners have been granted opportunities to engage with the relevant scientific and technology knowledge and skills.

It is hoped that the SBA booklet will influence teaching and learning positively and thus produce a phenomenon called *washback* (or *backwash*) in educational measurement. Tsagari (2007:4) posits that the impact of washback can be positive (beneficial), negative (harmful) or neutral (no effect). It is therefore necessary for the South African education system to consider carefully how this SBA Booklet should be used and thus monitor and evaluate their influence. It is therefore essential that the South African education system guards against the negative and neutral washback because both of them pose a risk for the education system.

3. Elements of Assessment Tasks

The following aspects are key to assessment tasks for Natural Sciences and Technology and should be covered:

3.1 Specific Aims

All the three *Specific Aims* should be covered in each term.

3.2 Science and Technology Process Skills

Each assessment task should cover some of these skills because they are an integral part of what should be assessed. All of these skills should have been assessed by the end of an academic year.

3.3 Language skills

These skills entail reading and writing in accordance with the nature of the subject. These skills should be assessed as part of assessing scientific and technology knowledge and skills.

3.4 Cognitive levels

Although cognitive levels only appear in the assessment section of the CAPS, like assessment in general, they assume certain levels of engagement with the knowledge and skills in the subject during teaching and learning.

4. Description of the forms of assessment

No.	Form of assessment	Description
1.	Practical tasks	<p>In carrying out practical tasks learners are required to demonstrate a skill or proficiency. Learners use materials, tools and equipment to create, produce or do something. The teacher observes the learner demonstrate specific practical skills (e.g. measure the voltage of a cell, use a thermometer to measure temperature, etc.). Practical tasks can be very useful for assessing how learners draw on knowledge and values to carry out practical skills (manual and/or behavioural, e.g. safety and handling of equipment).</p> <p>Any practical task should provide opportunities for learners to demonstrate the skills listed under Specific Aim 2. These may or may not include design/plan investigations skills. However, there are some circumstances in which only some of these skills would apply and not every skill can be assessed in every practical task.(CAPS, page 17)</p> <p><i>Assessment of practical tasks</i></p> <p>The assessment may be based on the end-result of the activity (the product), or the carrying-out of the activity (the process), or a combination of both. Assessment tools of projects could be a combination of rubric, memorandum, checklist, etc.</p>
2.	Tests and examinations	<p>Tests consist of a range of questions that cover the different cognitive levels – knowledge recall, understanding, application, evaluation, analysis and synthesis. Learners are required to respond to questions within a specified time under controlled conditions. Since they are generally easy to mark reliably they are a good way to conduct formal assessment, however, they can be a very useful informal tool too. Examinations are similar to tests, the only difference is that they cover more content.</p>
3.	Investigation activities	<p>The investigation activities are about “Doing Science”. They are about investigating relationships and solving problems in the natural world. These usually start off with a question that is followed by a hypothesis (a speculative answer to the question), the validity of which will be tested. Investigation activities are one type of performance activity that engage learners in some form of systematic inquiry of a phenomenon. Learners can investigate and solve: problems of making, problems of observing, surveying and</p>

No.	Form of assessment	Description
		<p>measuring, problems of comparing, and problems of determining the effect of certain factors.</p> <p><i>Assessment of investigation activities</i></p> <p>Each stage of an investigation activity involves a range of thinking skills, therefore it is important to assess each stages of an investigation activity (process), as well as the end-result (the product). Assessment tools can be a combination of rubric, memorandum, checklist, etc.</p>

5. Assessment Tasks

The assessment tasks given below are examples of tasks per term for each grade.

5.1 Grade 4

5.1.1 Term 1: Practical Task

ACTIVITY: Germinating a seed

MATERIALS (what you need):

- bean seeds
- cotton wool
- plastic lids (from empty peanut butter jars for example)

INSTRUCTIONS

1. Place two layers of cotton wool in the plastic lid.
2. Place a few of your seeds between the two layers of cotton wool.
3. Drizzle water over the seeds. You need to water the cotton wool enough to wet it but **NOT TO DROWN THE SEED!** There should be **NO WATER** running over the sides of the lid or your seed will drown!
4. Place your seeds in a warm place near a window.
5. Water your seeds whenever you feel the cotton wool is almost dry. Be careful not to drown your seeds!

QUESTIONS

1. Before you water your seeds, describe how your seeds look and feel.
2. Draw your seeds between the cotton wool on the first day.
3. Keep watching your seeds every day. How long did it take them to germinate? And what do your seeds look and feel like now?
4. What do you think made your seeds revive?

Grade 4

5.1.2 Term 2: Practical Task

ACTIVITY: Heating and cooling to cause a change of state

MATERIALS (What you will need)

- kettle
- liquid water
- glass or mirror
- gloves or towel

INSTRUCTIONS

1. This activity could be quite dangerous as you might burn yourself with the hot water, so your teacher is going to demonstrate it for you.
2. Boil the water in the kettle.
3. Put a glass or mirror 30 cm above the boiling kettle (you need to wear gloves made of thick material or use a towel to avoid burning your skin)

4. Your teacher will then let you come up to see what is taking place. Make sure you have a look at the mirror.

QUESTIONS

1. What was the change of state when the water boiled and became steam?
2. You cannot actually see the steam. The steam is extremely hot and quickly cools and forms tiny droplets in the air. When the steam changes into tiny water droplets, what is this called?

Grade 4

5.1.3 Term 3: Practical Task

ACTIVITY: Energy from the Sun causes heating

When light energy from the Sun hits objects, some of the energy is absorbed. Some of the energy bounces back.

MATERIALS

- 4 thermometers
- Black paper
- White paper

INSTRUCTIONS

1. Put one thermometer in a shady place.
2. Put three thermometers in a sunny place on the same surface.
3. Cover the bulb of one thermometer with black paper, cover the bulb of another thermometer with the white paper and leave the last thermometer in the sun with no paper covering it.
4. Which thermometer do you think will show the highest temperature (°C) after 10 minutes?
5. Wait for 10 minutes and then write down the temperature reading on each thermometer in the table.

No.	Thermometer	Temperature (°C)
1.	In shade	
2.	In the Sun with black paper	
3.	In the Sun with white paper	
4.	In the Sun with no paper	

6. Which thermometer had the lowest temperature after 10 minutes?
7. Did the thermometer in the Sun with the black or white paper covering had the highest temperature after 10 minutes?
8. Explain your results

Grade 4

5.1.4 Term 4: Practical Task

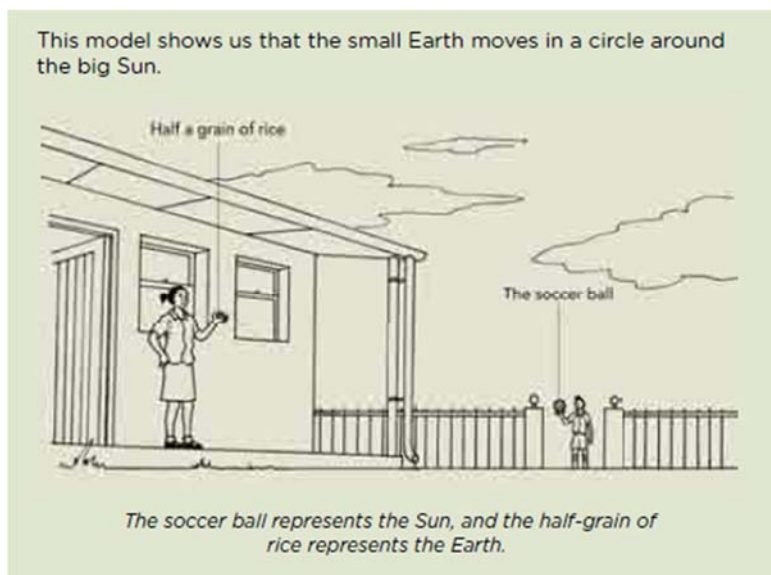
ACTIVITY: Use a model to show how far the Earth is from the Sun.

MATERIALS

- a grain of rice; break it in half
- a soccer ball
- space to move, such as the playground or soccer field

INSTRUCTIONS

1. Look at the picture below.



2. One learner stands in a place where there is a lot of room all around them. This learner holds the soccer ball. This ball represents the Sun.
3. Another learner stands next to her and holds the half-grain of rice. It represents the Earth.
4. The learner holding the rice walks away from the learner holding the soccer ball with 24 of the biggest steps he can make. That distance is about 24 metres. The 24 metres represents the distance from the Sun to the Earth.
5. Now the learner carries the half-grain of rice, walking to walk to his right side. He must always stay 24 metres from the soccer ball. If he does this he will walk in a circle around the soccer ball.

This model shows us that the small Earth moves in a circle around the big Sun.

The soccer ball represents the Sun, and the half-grain of rice represents the Earth.

QUESTIONS

1. Stand 24 metres away from the soccer ball. Hold up one finger in front of you, and cover the soccer ball with your nail. Is the soccer ball really as big as your fingernail?
2. Why does the ball look as big as your nail?

The Sun is so big that thousands and thousands of Earths can fit inside the Sun. In the picture you can see how their sizes compare.

This is how the size of the Earth compares to the size of the Sun. The Earth is not really this close to the Sun.

5.2 Grade 5

5.2.1 Term 1: Practical Task

ACTIVITY: Studying an aquatic habitat

Learners will work in groups of 3 or 4.

MATERIALS

- pencil
- paper
- clipboard
- sunblock & a hat

INSTRUCTIONS

1. Visit an aquatic habitat near your school [a stream or river, pond or dam, or perhaps a rock pool if you are near the sea]
2. Find examples of 3 animals and 3 plants that live in that environment.
3. Carefully study where they live and how you think the animals and plants are suited to their habitat, Record all findings and complete the questions below.
4. If possible, take some pictures of the plants and animals you observe.
5. Report this information back to your class.

QUESTIONS

1. Name and describe your habitat/ecosystem.
2. Identify at least 3 animals and 3 plants in this environment.

No.	Animals	Plants
1.		
2.		
3.		

3. Record all your findings in the table below.

Animals

Question	Animal 1	Animal 2	Animal 3
What do the animals eat?			
How do the animals breathe?			

Plants

Question	Plant 1	Plant 2	Plant 3
Are the stems of the plants rigid or flexible?			
Do the plants grow inside the water or just outside?			

4. Report this information back to your class.

Grade 5

5.2.2 Term 2: Practical Task

ACTIVITY: Learning about magnetism

MATERIALS

- Metal objects: coins, spoon, metal pencil sharpener, nail or screw, paper clip, thumb tack, pin, steel wool etc.
- Non-metal objects: paper or cardboard, cotton wool, fabric, plastic spoon, cork, sponge, piece of chalk, small glass
- Magnet

INSTRUCTIONS

1. Sort the objects in front of you into two groups: metals on one side and non-metals on the other.
2. Write the names of all the metal objects in the column named "Metal objects" in the table below.
3. Write the names of all the non-metal objects in the column named "Non-metal objects" in the table below.
4. Hold each object close to the magnet to see if it is attracted to the magnet or not?
5. Write your observations in the tables as follows:

Objects attracted to magnet

<i>Metal object</i>	<i>Non-metal objects</i>

Objects not attracted to magnet

<i>Metal object</i>	<i>Non-metal objects</i>

142 Matter and Materials

6. Write down a conclusion of your observations about the materials and the magnet.

Grade 5

5.2.3 Term 3: Practical Task

ACTIVITY: Making a simple circuit

MATERIALS

- 2 torch batteries
- 1 light bulb
- connecting wires

INSTRUCTIONS

Part 1

1. Set up the circuit as shown in the diagram.
2. Make sure all the wires are connected to form a closed loop.

QUESTIONS

1. What do you observe?
2. What happens when you disconnect one end of one of the wires?
3. The one end of the battery is labelled positive and the other end is negative. Draw a diagram of the battery and label the ends as positive or negative.

Part 2

1. Set up a new circuit with 2 batteries and 1 globe.
2. Explain how you connected the batteries so the globe still light up.
3. Describe if the globe glowed the same or brighter or dimmer than in experiment 1?
4. Explain your answer to question 2.
5. Describe an electrical circuit.

Grade 5

5.2.4 Term 4: Practical Task

ACTIVITY: A scale model of the solar system

MATERIALS

- 100m heavy string
- 9 pieces of heavy cardboard
- Scissors
- Permanent marker

INSTRUCTIONS

1. Learners are divided up into 8 groups and each group is assigned a planet.
2. Each group must cut a piece of string to represent the distance of their planet from the sun, using the lengths indicated in the table below.

No.	Planet	Actual distance from Sun (km)	Length of string (m)
1	Mercury	58 0.4	
2	Venus	108 0.7	

3	Earth	150 1.0	
4	Mars	228 1.5	
5	Jupiter	779 5.2	
6	Saturn	1 434 9.6	
7	Uranus	2 873 19.2	
8	Neptune	4 495 30.0	

- The actual distance of the planets from the sun is given in kilometres (km) and the length of the string is in meters (m). 1 kilometre is 1000 meters.
- Convert the actual distance of the different planets from kilometres to meters to fill in the following table.
- Each group must cut a circle out of the cardboard and write the name of their planet and the actual distance from the sun on it.
- Make a hole at one edge of the cardboard and tie the length of string to it.
- Now it is time to go outside to a big open space, like the school field!
- Your teacher will be the sun in the centre. She does not move as the sun does not move.
- One member from each group must hand the "Sun" the end of their length of string and then stretch out their length of string.
- Do this one at a time starting from Mercury and going out to Neptune. You do not all need to be in a straight line but can be in different positions around the "Sun".
- Place the strings on the ground, all stretched out in different directions.
- Walk around so that you can all see the scale model of the solar system.
- Now comes the tricky part - making the planets orbit the sun.
- Select one learner from each group to be the planet.
- He/she must pick up the planet and walk in a circle around your teacher, all going in the same direction. Try and walk at the same speed.
- Swop with other learners in your group so that you each have a turn to be a planet orbiting the sun.

5.3 Grade 6

5.3.1 Term 1: Practical Task

ACTIVITY: Research one of the diseases

MATERIALS

- books from the library, information from the internet
- sheets of paper
- coloured pens and pencils

INSTRUCTIONS

- Choose one of the diseases mentioned above and do some extra reading and find information on the disease and write a report under the following headings: causes, which people are most likely to suffer from it and why, symptoms, health risks, any possible treatments, prevention.
- You must design a poster about the chosen disease where the pictures must reflect the information about the disease.
- The poster is to be presented to the class.

Grade 6

5.3.2 Term 2: Practical Task

ACTIVITY: How to separate mixtures

Learners do different activities in their respective groups.

Each group writes up instructions on how to separate mixtures using their allocated method of separation, namely, *sieving*, *filtering*, *hand sorting*, *settling* and *decanting*.

Learners should:

- use English Dictionaries, textbooks, internet, or any other material to understand the meaning of the term (means of separating mixtures) allocated to them;
- write up a few sentences explaining their allocated process;
- prepare the mixture they will be separating with their apparatus;
- demonstrate the separation in class using their prepared mixture and apparatus;
- write up instructions on how to prepare their method of separating a mixture;
- they must be prepared to respond to questions from other learners.

Grade 6

5.3.3 Term 3: Practical Task

ACTIVITY: Energy required by electrical appliances and devices

INSTRUCTIONS

1. Find the appliances or devices listed in the table. If you do not have them in your home or school, ask family, friends or neighbours if you could look at theirs.

Table of appliances and devices

Appliances	A/mA	V/mV	Hz	W/kW	Power in Watt
Cell phone charger					
Electric kettle					
Television set					
Light bulb					
Heater					
Computer					
Electric iron					
Microwave oven					

2. Have a look at each appliance and check for a label with information like 230 V-240 V; 50 Hz; 2 kW. This information is usually at the back or the bottom of the appliance or

device. W or kW indicates how much energy is required by the device in a certain time. It is called the power required by the device. The higher the value the more energy the device uses in a specific time.

3. Now record on the table the number that is followed by a:
 - 3.1 A or mA in column 2
 - 3.2 V or mV in column 3
 - 3.3 Hz in column 4
 - 3.4 W or kW on the label in column 5
4. Look for three other appliances or devices and add them on the list in the table.
5. Record all the power values in column 6 in **watt**.
 [If the power is given in kW, multiply this number by 1000 to get the value in watt W].
 [If the device does not show a value in W or kW, look for two quantities given in volt (V) and milli-ampere (mA). Multiply these two numbers and then divide the answer by 1000 to get the power in watt]
6. Now arrange the appliances or devices in the next table in terms of the power required. The list should be from small to large values of the power.

No.	Appliance or device	Power
1.		
2.		
3.		
4.		

QUESTIONS

1. Which two appliances have the lowest power requirements?
2. What do these appliances have in common?
3. Which two appliances have the highest power requirements?
4. What do these appliances have in common?
5. Which appliance or device will the household pay more for electricity?
6. Give a reason for answer in question 5.

Grade 6

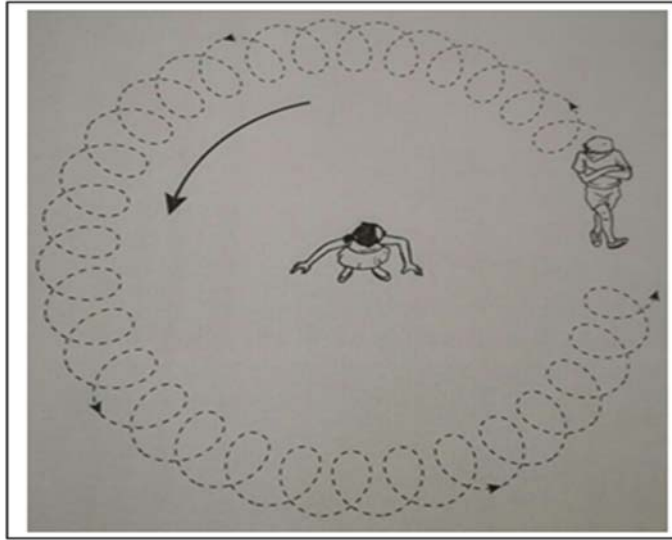
5.3.4 Term 4: Practical Task

ACTIVITY: Make a model of the Earth revolving around the Sun

INSTRUCTIONS

1. We are going to use our bodies to understand the difference between rotation and revolving
2. First, the whole class must spread out and stand on a spot. Now spin around with your arms out, staying on one spot. This is called **rotation**! The earth rotates like this on its axis.
3. Get into pairs. One learner must stand in one spot and the other learner must walk in a circle around the other person. This is **revolution**. The second learner is revolving around the learner standing still in the middle. The Earth revolves like this around the sun.

4. Now, let's put both movements together, as the Earth rotates on its axis it also revolves around the Sun. This might be tricky! Spin around (rotate) while also moving in a big circle around the Sun. this might be tricky! Spin around (rotate) while also moving in a big circle around your partner (revolve). Look at the picture below. *The learner is rotating (spinning) and revolving around his partner.*



QUESTIONS

1. In this model, who represents the Sun and who represents the Earth?
2. When you are spinning and walking in a circle around your partner, sometimes you face your partner and sometimes your back is to your partner. Which of these represents day for you, and which represents night for you.
3. You could spin around very quickly. In the real Earth, how many hours pass for the Earth to rotate once?
4. You could move around your partner quite quickly. On the real Earth, how long does it take for the Earth to go once around the Sun?

6. Weighting of Marks for Tests and Examinations

6.1 Grade 4 Mid-Year Examinations

	Topics	Cognitive levels			Allocated Time in CAPS	Suggested mark allocation
		Low (50%)	Middle (35%)	High (15%)		
TERM 1	Living and nonliving things				2 weeks	4
	Structures of plants and animals				2½ weeks	5
	What plants need to grow				1 week	2
	Habitats of animals				2 weeks	4
	Structures for animal shelters				2½ weeks	5
TERM 2	Materials around us				3½ weeks	7
	Solid materials				2 weeks	4
	Strengthening materials				2 weeks	4
	Strong frame structures				2½ weeks	5
	TOTAL	20 marks	14 marks	6 marks	20 weeks	40 marks

6.2 Grade 4 Final Examinations

	Topics	Cognitive levels			Allocated Time in CAPS	Suggested mark allocation
		Low (50%)	Middle (35%)	High (15%)		
TERM 3	Energy and Energy transfer				2½ weeks	6
	Energy around us				2½ weeks	6
	Movement and Energy in a system				2½ weeks	6
	Energy and Sound				2½ weeks	6
TERM 4	Planet Earth				2 weeks	4
	Our closest star				1 week	2
	The Earth and the Sun				1 week	2
	The Moon				2 weeks	4
	Rocket systems				2 weeks	4
	TOTAL	20 marks	14 marks	6 marks	18 weeks	40 marks

6.3 Grade 5 Mid-Year Examinations

	Topics	Cognitive levels			Allocated Time in CAPS	Suggested mark allocation
		Low (50%)	Middle (35%)	High (15%)		
TERM 1	Plants and animals on Earth				2½ weeks	6
	Animal skeletons				1½ weeks	3
	Skeletons as structures				2½ weeks	6
	Food chains				1½ weeks	3
	Life cycles				2 weeks	5
TERM 2	Metals and non-metals				2 weeks	5
	Uses of metals				2½ weeks	6
	Processing materials				3½ weeks	8
	Processed materials				2 weeks	5
	TOTAL	22 marks	16 marks	7 marks	20 weeks	45 marks

6.4 Grade 5 Final Examinations

	Topics	Cognitive levels			Allocated Time in CAPS	Suggested mark allocation
		Low (50%)	Middle (35%)	High (15%)		
TERM 3	Stored energy in fuels				3 weeks	8
	Energy & Electricity				3 weeks	8
	Energy & Movement				1 week	3
	Systems for moving things				3 weeks	8
TERM 4	Planet Earth				1 week	3
	Surface of the Earth				2½ weeks	6
	Sedimentary Rocks				2 weeks	5
	Fossils				2½ weeks	6
	TOTAL	22 marks	15 marks	8 marks	18 weeks	45 marks

6.5 Grade 6 Mid-Year Examinations

	Topics	Cognitive levels			Allocated Time in CAPS	Suggested mark allocation
		Low (50%)	Middle (35%)	High (15%)		
TERM 1	Photosynthesis				2½ weeks	6
	Nutrients in food				1½ weeks	4
	Nutrition				1½ weeks	4
	Food processing				2½ weeks	6
	Ecosystems and Food webs				2 weeks	5
TERM 2	Solids, liquids and gases				½ weeks	1
	Mixtures				1 week	3
	Solution as special mixtures				2½ weeks	6
	Dissolving				1 week	3
	Mixtures and water resources				2½ weeks	6
	Processes to purify water				2½ weeks	6
	TOTAL	23 marks	16 marks	11 marks	20 weeks	50 marks

6.6 Grade 6 Final Examinations

	Topics	Cognitive levels			Allocated Time in CAPS	Suggested mark allocation
		Low (50%)	Middle (35%)	High (15%)		
TERM 3	Electric circuits				2½ weeks	7
	Electrical conductors and insulators				2 weeks	6
	Systems to solve problems				2½ weeks	7
	Mains electricity				3 weeks	8
TERM 4	The Solar System				2½ weeks	7
	Movements of the Earth and Planets				1 week	3
	The movement of the Moon				1 week	3
	Systems for looking into space				1 week	3
	Systems to explore the Moon and the Stars				2½ weeks	7
	TOTAL	23 marks	18 marks	9 marks	18 weeks	50 marks

7. Guide to Setting Questions

7.1 General Guide to Constructing Questions

- The importance and clarity of instructions to learners, general to the entire test/examination, or to specific questions, cannot be over-emphasised.
- Make all instructions **simple** and **very clear** to the learner. Each learner must know exactly how she or he is expected to answer the question, for example, *encircling the letter of the correct answer*, or *write the letter*, etc.

Use...

- clear and simple language;
- simple sentence and structure;
- vocabulary that is at learners' level of understanding;
- short sentences;

Avoid...

- passive where possible; it makes a sentence impersonal and complex;
- conditional forms (sentences starting with "*if*");
- a double negative;
- superfluous (unnecessary) words;
- abstract and metaphorical language;

7.2 Multiple Choice Questions

- Learners select a correct response from a few options.
- This type of question can be used to assess lower order to higher order cognitive skills.

The different parts of a multiple choice question

Item

Which statement is true about the particles of a liquid compared to the particles of a gas? **stem**

Option

- | | | |
|---|--|-------------------|
| { | A. Particles of a liquid are slower and farther apart. | distractor |
| | B. Particles of a liquid are faster and farther apart. | distractor |
| | C. Particles of a liquid are slower and closer together. | key |
| | D. Particles of a liquid are faster and closer together. | distractor |

The Stem...

- should specify what the question requires;
- should be clear and concise;
- can be a question or an incomplete statement;
- is stated in positive form wherever possible;

Avoid...

- use of **a/an** or **is/are**, **except** or **not** in the stem;
- use of specific determiners such as **all**, **always**, and **never**;
- use of modal verbs such as **can**, **may**, **could**, **might**, etc.;

- use of negatives in stems where possible;
- unnecessary information;
- giving clues to the key;

The Options

- there should be **only one** correct answer (the **key**);
- the **key** should not be, or sound like it is directly from a textbook;
- the **key** should not be easily identified by other correct/incorrect options;
- make sure the options follow the stem in a grammatically correct manner;
- arrange options in some logical manner;
- the tense and style in the options must be the same as in the stem;
- keep options as short as possible;
- use **four** options only;
- use distractors that are as realistic and as plausible as possible;
- options should be worded in a similar way;
- use distractors with common misconceptions and frequently confused ideas;
- make the options similar in grammar, length and complexity;
- place common information in the stem rather than in the options;
- **a/an** or **is/are** should be in the options, not in the stem;
- keep options parallel in format;
- arrange options in logical order if possible;
- options selected by very few learners should be altered if the item is reused;

Avoid...

- use of **all of the above** or **none of the above** or **both A and B**, etc.;
- use of specific determiners such as **all**, **always**, and **never**;
- use of **not**;
- use of double-negatives;
- multiple correct options;
- patterns among the keys;
- use of incomplete or fill-in-the-blank sentences;
- giving away answers to a previous question with a later question;
- additional qualifying words or phrases to the key;
- repeating the same words in all of the options by moving the words to the stem;

7.3 True/False Questions

- True/False questions are usually declarative statements that the learner must judge as *true* or *false*.
- The true/false test is the simplest form of selected response formats. However, its limitation is its susceptibility to guessing.
- construct statements that are definitely true or definitely false, without additional qualifications;
- make the statements short, clear and in simple language;
- construct an approximately equal number of **true** and **false** statements;
- arrange **true** and **false** statements randomly;
- keep true and false statements approximately the same length;
- test only one idea in each question;
- always state the question in a positive form;

Avoid...

- all forms of negative statements;
- long and complex sentences;
- absolute terms such as **never**, **always**, etc.;
- modal verbs such as **could**, **can**, **may**, etc.;
- patterns such as **TTFFTTFF**, **TFTFTF**, etc.;
- taking statements directly from textbook;

7.4 Matching questions

- Matching questions consist of Column A with **premises** (or questions) and Column B with **responses** (or options).
- **Premises** in Column A are usually numbered 1, 2, 3, etc., and **responses** in Column B numbered with capital letters A, B, C, etc. Learners are required to match the premises with the responses.
- use only material from the same content;
- make all **premises** and all **responses** the same type (e.g., a list of molecular formulae);
- make sure that all the **premises** and **responses** are on the same page;
- use longer phrases as **premises** and shorter phrases as **responses**;
- provide more possible **responses** than **premises**;
- write the **premises** to be approximately equal in length;
- make the **responses** the shorter items;
- arrange the **responses** in some logical manner;
- use numbers for **premises** and alphabetical letters for **responses**;
- specify whether or not **responses** can be used more than once;

7.5 Short-Answer Questions

- Short answer questions require learners to supply appropriate words, numbers or symbols to answer a question or complete a statement.
- These questions include filling in missing words or direct questions to be answered in one word or a short statement.
- use only to test important ideas or concepts, **not** specific details;
- make sure there is only one possible answer;
- omit only **key words** from the statement;
- wherever possible, put blank spaces near the end of the statement;
- leave a maximum of two blank spaces per statement;
- if the question requires a numerical answer, indicate the units in which it is to be expressed;

Avoid...

- verbal associations that give away the answer;
- specific determiners that make certain answers probable such as, **sometimes**, **always**;
- taking a sentence directly from a textbook;
- trick questions that might confuse a knowledgeable learner;
- verbal clues and specific determiners such as **the**, **an**, **a**;
- having a blank space at the beginning of the statement;
- many blank spaces in one statement;
- adjusting the length of the blank space or the number thereof;



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