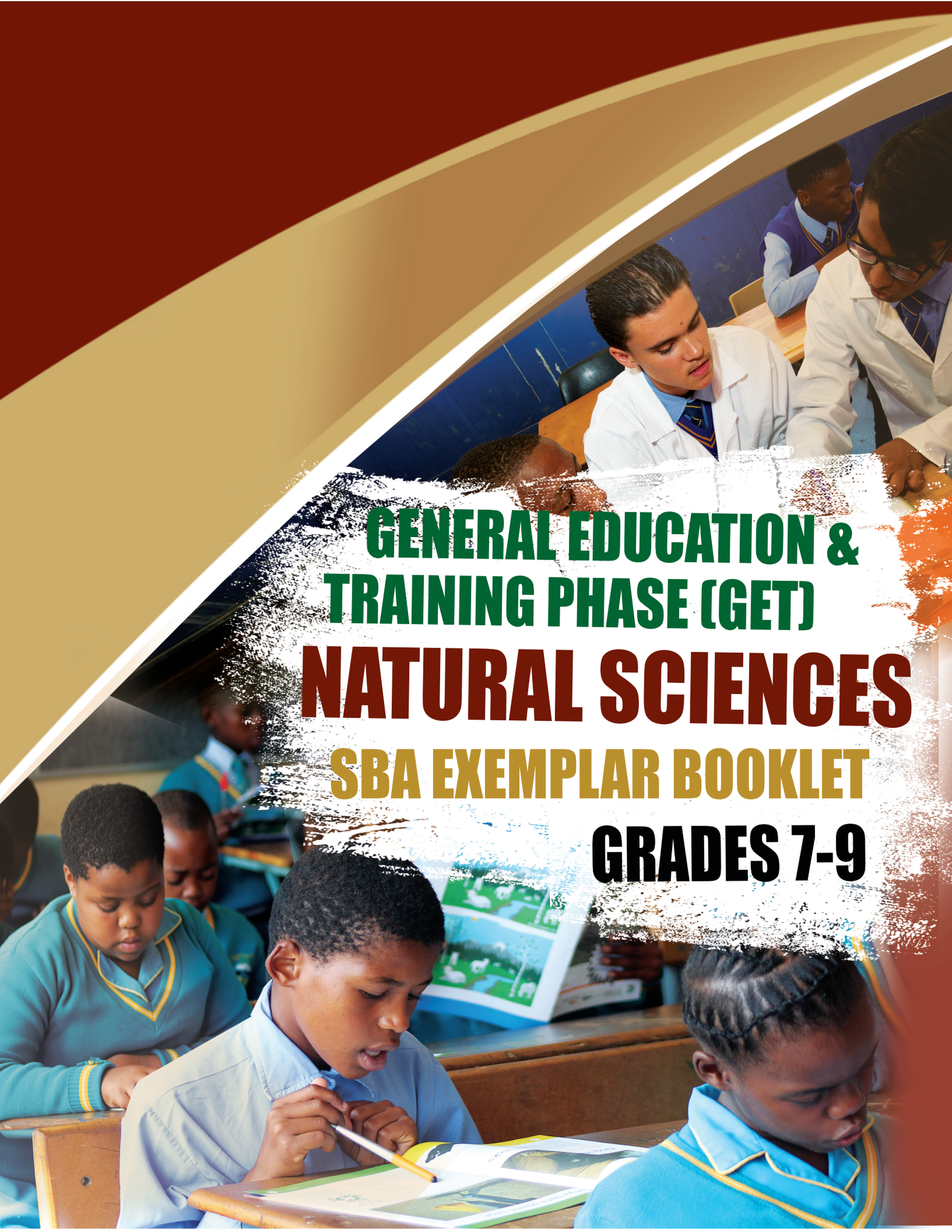


GENERAL EDUCATION & TRAINING PHASE (GET)

NATURAL SCIENCES

SBA EXEMPLAR BOOKLET

GRADES 7-9

basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

Read to Lead
A Reading Nation is a Leading Nation

2030 NDP

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

DATE: 13/09/2017

Table of Contents

1. Background and Introduction

This is a framework for the development of School-Based Assessment tasks for Natural Sciences. Necessarily, this framework draws from the *Curriculum and Assessment Policy Statement* (CAPS) for *Natural Sciences* (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 Process Skills*.

2. Assessment in Natural Sciences

In this framework assessment is conceptualised from the assumption of how teaching and learning should be taking place in Natural Sciences. 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 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 the 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 should be covered:

3.1 Specific Aims

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

3.2 Science 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 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.	Projects	Projects are tasks in which learners illustrate or apply knowledge that they have gained in class. Projects may involve aspects of investigation and/or design. Learners may collect data to solve a problem or to understand a particular set of circumstances and/or phenomena. In doing this, they can build models, compile reports, essays or posters and even give presentations. Learners can do projects individually or in groups; working alone but with some support and guidance from the teacher. The teacher directs the choice of the project, usually by providing the learner with a topic or brief for the investigation. *Assessment of projects* Teachers can assess different stages of projects separately, or the entire project. Assessment of projects should be based on the understanding of content, application of skills and values applicable in a relevant context. Assessment tools of projects could be a combination of rubric, memorandum, checklist, etc.
2.	Practical tasks	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). 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*) *Assessment of practical tasks* 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.

3.	Tests and examinations	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 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.
4.	Investigation activities	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 measuring, problems of comparing, and problems of determining the effect of certain factors. *Assessment of investigation activities* 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.

5. Assessment Tasks

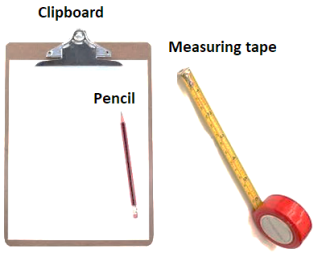
The assessment tasks given below are examples of tasks per term for each grade.

5.1 Grade 7
5.1.1 Term 1: Practical Task/Investigation

ACTIVITY: The height of learners in your class

MATERIALS

- 2 m measuring tape
- pencil
- Table drawn on scrap paper
- Clipboard to work on



INSTRUCTIONS

1. Attach a measuring tape or similar apparatus to a wall in your class.
2. Learners who are having their length measured must be barefoot and must place their heels against the wall, standing up straight against the wall.
3. Learners who are taking the measurement must stand on a chair and place a ruler or pencil horizontally on the person's head (and flatten the hair) when taking the measurement.
4. Another learner should record the name and height of each learner.
5. Use this method to record the height of each learner in the class.
6. Draw a table with two columns for names and heights to record the measurements.
7. Represent these results on a bar graph in a grid paper.

RESULTS

a) Use the information from the table to draw a bar graph.
b) Think about what must go along the horizontal axis (x-axis) and vertical axis (y – axis).
c) N.B: The x-axis is for the independent variables and the y-axis is the dependent variable.
d) Give your graph a heading.

TAKE NOTE

Add up all the individual measurements then divide by the number of learners you have measured to obtain the average.

QUESTIONS

1. Who is the tallest and who is the shortest in your class?
2. What is the average height of all the learners in your class? Show your calculations in your exercise book.

Variation

1. What is the average height of the boys and what is the average height of the girls?
2. As a homework activity, measure the heights of some of the adult members in your family. Record these heights in the following space to discuss with your class the next day.

3. Discuss these results with your class:
    a) Conduct a research to find out if the shortest and tallest people in your class also have such family members.
    b) Discuss possible relationships between the heights of learners in your class and the adults in their family.
    c) What other similarities are there between their family members?
    d) Write down some notes from your class discussions in your exercise books.

Grade 7
5.1.2 Term 2: Practical Task/Investigation

ACTIVITY: Process of Separation of Mixtures

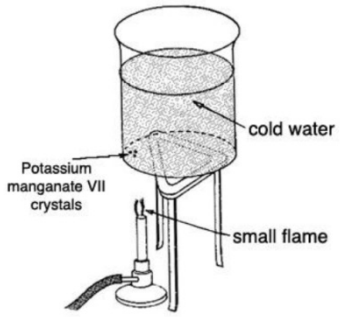
Learners do different activities in their respective groups.
Each group writes up instructions on how to separate mixtures using their allocated method of separation, namely, *using a magnet; evaporation; distillation; chromatography*.

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 7
5.1.3 Term 3: Practical Task/Investigation

ACTIVITY: Convection in water



MATERIALS

- 2 x 200ml glass beakers
- Potassium permanganate
- Bunsen or spirit burner, tripod stand, wire gauze

INSTRUCTIONS

1. Pour 100ml of cold tap water into a beaker A.
2. Carefully add 1 tsp of potassium permanganate crystals into the beaker. DO NOT STIR.
3. Heat the water using the Bunsen or spirit burner.
4. Observe what happens.
5. In beaker B, add 100ml cold tap water. Add 1 tsp potassium permanganate into the beaker. DO NOT STIR AND DO NOT HEAT the liquid.
6. What did you observe about the potassium permanganate?
7. Explain the reason for your results:
8. Compare this to the beaker which was not heated. What did you observe in beaker B?

Grade 7
5.1.4 Term 4: Practical Task/Investigation

ACTIVITY: The Earth's tilt

MATERIALS

- globe or ball/balloon
- non-permanent marker or stickers
- card and tin foil to make a star
- string
- scissors
- glue

INSTRUCTIONS

1. Mark on the globe the position of the North and South Pole with a marker or stickers. If using a ball or balloon mark the positions of two points directly opposite each other on the surface of the ball / balloon which will be used to represent the North and South Poles of the ball/balloon.
2. Using the scissors, cut the card into the shape of a star.
3. Cover the star in foil, using the glue if necessary to stick it to the card.
4. Hang the star up from the ceiling using the string. Make sure it is high up and clearly visible from the whole of the class.
5. Sit in a circle with the rest of your class, your class teacher should sit or stand in the middle of the circle representing the Sun.
6. Select one member of your class in the circle to start the activity and pass the globe to them.
7. Tilt the globe away from the vertical, pointing the North Pole towards the hanging star.
8. Pass the globe around the circle keeping the North Pole pointed in the same direction towards the hanging star. Remember to keep the globe spinning on its axis as it is passed around!
9. Note how as the globe moves around the circle, sometimes the Northern Hemisphere is tilted more towards the Sun, sometimes the Southern Hemisphere is pointed more towards the Sun and sometimes neither hemispheres are tilted towards the Sun.

5.2 Grade 8
5.2.1 Term 1: Practical Task/Investigation

ACTIVITY: Research an infectious disease

INSTRUCTIONS

1. Investigate the virus assigned to you by your teacher.
2. Use the resources in the library, internet and interview professionals in the healthcare for more information.
3. List all your resources in the form of a bibliography.

4. Write your investigation report under the following subheadings:
   (a) The causes of the disease
   (b) The symptoms of the disease
   (c) Treatment of the disease
   (d) How do community members react to people suffering from the diseases/illnesses?
5. Use the information in the table below:
   NB: All the diseases and their causes must be tabulated to avoid repetition
6. Use the rubric to guide you on what is required of you.

Grade 8
5.2.2 Term 2: Practical Task/Investigation

ACTIVITY: Which material is denser?

MATERIALS

A variety of objects that have the same size (*volume*) but different *masses*: sponge, polystyrene, wood, metal, brick or stone.

INSTRUCTIONS

1. Handle all the different materials and compare their masses. You do not have to measure their masses on a scale. You can just feel how heavy they are in your hand.
2. Arrange them in order of increasing density. Do this activity as a group and discuss why some materials are denser than others.
3. If you do have access to a triple beam balance, measure the masses of each of the objects.

Material	***Mass(g)***
sponge	
polystyrene	
wood	
metal	
Brick or stone	

QUESTIONS

1. Imagine a brick and a loaf of bread that are the same size. Would the brick or the bread have a greater volume?
2. Which one, the brick or the bread, has more mass?
3. Which one, the brick or the bread, would have the greater density? Explain your answer.

Grade 8
5.2.3 Term 3: Practical Task/Investigation

ACTIVITY: Making a simple electroscope

MATERIALS

- glass jar, with lid
- 14 gauge copper wire, about 12 cm in length (The thicker the piece the better it holds its shape)
- plastic straw or plastic tubing
- 2 small pieces of aluminium foil
- piece of wool cloth
- plastic ruler
- glass rod

INSTRUCTIONS

1. Twist one end of the copper wire into a spiral shape. This will increase its surface area.
2. Make a hole in the jar lid and push a small piece of the plastic tubing through the hole.
3. Put the other end of the copper wire through the straw so that the spiral end is on the outside of the lid.
4. Make a hook out of the pointed end of the copper wire.
5. Cut two rectangular strips of aluminium foil.
6. Put each piece of aluminium foil onto the hook. Make a small hole in the aluminium foil to allow it to hang from the hook.
7. Carefully put the hook end of the copper wire into the glass jar and close the jar.
8. Rub the ruler with the wool cloth for a minute.

QUESTIONS

1. What **do** you observe when you **bring** the ruler close to the copper wire?
2. What happens if you move the ruler away from the copper wire?
3. Why do the pieces of aluminium foil move apart?

CONCLUSION

Write a short paragraph to explain what would happen if you brought a positively charged object close to your electroscope.

Grade 8
5.2.4 Term 4: Project; Practical Task/Investigation

ACTIVITY: Make the Milky Way

MATERIALS

- thick piece of black cardboard at least 30 cm across
- Pair of scissor
- Prestik
- Polystyrene ball to represent the sun
- Orange paints
- A4 paper
- Coloured bids , white, blue yellow ,red and orange

- Other materials for your model, either collected by you or supplied by your teacher that can assist you to make model presentable.

TAKE NOTE
You will learn more about the life cycle of stars in Gr 9. Younger stars are hotter and bright white or blue in colour, while older stars are cooler and more yellow and red in colour.

INSTRUCTIONS
1. You need to build a 3 dimensional model of the Milky Way Galaxy.
2. Cut out a circle of radius 15 cm from the black card and use this to build your 3D model.
3. You must show the central bulge, the spiral arms and the different coloured stars using the bids and the sun painted orange.
4. Mark the position of our Sun on your model and place it .NB make sure that it has solar flares use the A4 papers to make solar fares.
5. Using your model, view it from different angles and compare the view you have with the images of the Milky Way searched from internet or picture given by the teacher.
6. You must show the central bulge
7. The spiral arms and the different coloured stars using the bids and
8. The sun painted orange.
9. Mark the position of our Sun on your model and place it. NB make sure that it has solar flares use the A4 papers to make solar fares.

QUESTIONS
1. What are the two main parts that make up our Milky Way Galaxy?
2. Where are the spiral arms located; in the disk or the bulge of our galaxy?
3. Is our Sun found in the central bulge or in a spiral arm in the disk?
4. How far from the centre of the galaxy is our Sun located?

5.3 Grade 9
5.3.1 Term 1: Practical Task/Investigation

ACTIVITY: 3D model of a cell

In a 3D cell model, we will be making built models out of materials where we will use other objects to represent the actual parts of the cell.

INSTRUCTIONS
1. You must create a 3D model of a cell.
2. You may use whatever materials or 'media' you choose to create your cell.
3. Your model must clearly show the following:
    - cell membrane
    - nucleus with nuclear membrane
    - cytoplasm
    - mitochondria
    - vacuoles
    - chloroplasts

- Any other organelles that you might have learnt about

Requirements for your cell model:

- Your model and the examples of the organelles need to show some resemblance to the real organelle that we have learnt about so far.
- Your model needs to be clearly marked with a heading and your name.
- Each organelle needs to be clearly labelled and with each label you need to add a description of the function of that particular organelle.
- You also need to make an accompanying drawing (at least the size of an A4 page) including the labels of the structure of a basic plant and animal cell.
- Your teacher will assess your model according to a rubric.

Grade 9
5.3.2 Term 2: Practical Task/Investigation

ACTIVITY: The reaction of iron with oxygen

MATERIALS

- Bunsen burner or spirit burner
- matches
- safety goggles
- steel wool
- tongs

INSTRUCTIONS

1. Your teacher will demonstrate the combustion of iron in oxygen (which is present in air)
2. You should make careful observations during the demonstration and write down all your observations.
3. To guide you, some questions before and after the demonstration have been asked.

QUESTIONS

1. We are going to use steel wool in this demonstration.
   - 1.1 What is steel wool mostly made of?
   - 1.2 Is a substance a metal or a non-metal?
   - 1.3 How can you be sure that your response in 1.2 is correct?

2. During demonstration:
   - 2.1 Do you think steel wool will look different after it has been burned?
   - 2.2 Write down all the changes you have observed on steel wool after the demonstration.
   - 2.3 Was your prediction in 2.1 correct? Support your answer.
3. The demonstration was about the reaction of iron and oxygen.
   - 3.1 Write down the reaction in words.
   - 3.2 Write a balanced formula equation for this reaction, bearing in mind that the product is iron (II) oxide.
4. Metals burn in oxygen to form…….which is …….in this case.

Grade 9
5.3.3 Term 3: Practical Task/Investigation

INVESTIGATION: How does the material of the resistor affect the resistance?

How can we measure the resistance? Do you remember that in a series circuit, if we increase the resistance, then the strength of the current decreases? This means that we can use the strength of the current in the circuit as an indication of the amount of resistance in the circuit.

AIM: To determine whether different types of conducting materials have different resistances.

HYPOTHESIS: Write a hypothesis for this investigation mentioning the variables involved.

VARIABLES

1. Which variables would we need to keep constant in an investigation such as this?
2. Which variable is the independent variable?
3. Which variable is the dependent variable?

MATERIALS AND APPARATUS:

- Three 1, 5 V cells
- insulated, conducting wires with crocodile clips
- Conductors of different materials to test
- Ammeter
- Light bulb

METHOD:

1. Set up a circuit with the three cells, ammeter and light bulb connected in series.
2. Test each of the conductors by adding each to the circuit individually. Use crocodile clips to connect each conductor to the circuit, as shown below.

A similar setup showing a light bulb, one cell and a piece of copper wire connected in series.

3. Read the ammeter and record the reading for each test material.
4. Draw a bar graph to show your results.

RESULTS:

1. Draw a circuit diagram of the setup.
2. Draw a table showing your results.

Conducting material	Ammeter reading (A)
Copper	
Nickel	
Nichrome	
Iron	

3. Draw a bar graph of your results in the space provided.

ANALYSIS AND EVALUATION:

1. Which material offered the most resistance in the electric circuit? How do you know this?
2. Which material offered the least resistance in the electric circuit? How do you know this?
3. Are there any potential problems with the way in which this investigation was set up, or are there any ways in which you could have improved the design?

CONCLUSIONS:

1. What conclusion can you reach from this investigation?
2. Why must the different conductors have the same length and thickness?

Grade 9
5.3.4 Term 4: Project; Practical Task/Investigation

INVESTIGATION: Direct and indirect light and its effects on temperature

Scientists often use models to recreate the real world in a laboratory. In this investigation, you will use a model to simulate how sunlight strikes the surface of the Earth. You will use a torch to represent the Sun. You will change the angle at which light strikes a flat surface and see what effect this has on the heating of the surface. This will model how sunlight strikes the surface of the Earth at different angles.

INVESTIGATIVE QUESTION: Formulate an investigative question.

HYPOTHESIS: Formulate a hypothesis mentioning the variables involved.

IDENTIFY VARIABLES:

1. What are you keeping constant in this experiment?
2. What are you changing in this experiment?
3. What are you going to be measuring in this investigation?

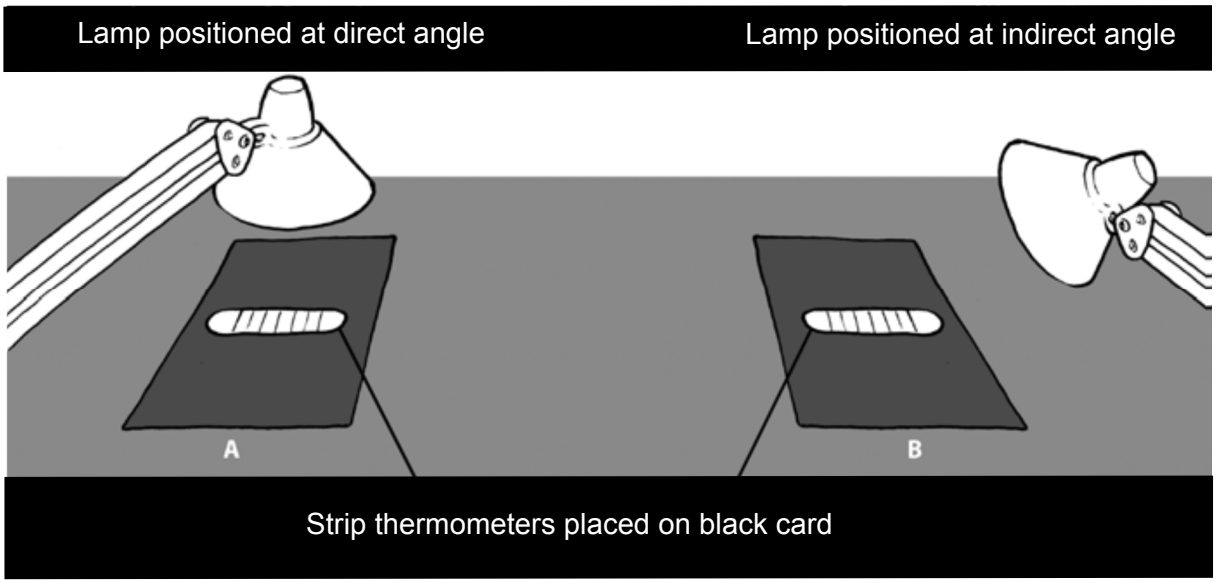
MATERIALS AND APPARATUS:

- Two desk lamps
- Two pieces of black card/paper
- Two strip thermometers
- Watch or clock
- Marker pen and/or sticker to label the cards

METHOD:

1. Place the two desk lamps on a table or desk about 1 metre apart from each other.
2. Point one of the desk lamps directly downwards towards the table, at a height of about 30 cm.
3. Place the black card under the light and label it "A".

4. Place the thermometer strip in the centre of the black card. The light bulb should be directly above the thermometer strip.
5. Adjust the second desk lamp so that it is at the same height as the first one, but instead of pointing it directly down at the table; tilt it slightly to one side (left-right direction).
6. Place the second piece of black card under this lamp and label it "B".
7. Place the second thermometer strip in the centre of the black paper. This light should shine indirectly over the thermometer.
8. Record the temperature of both thermometers in the table below.
9. Turn on both lights at the same time. Wait for about 30 seconds and then record the temperatures of the thermometers in the table below.



104 RESULTS AND OBSERVATIONS:

Card	Initial temperature (°C)	Final temperature (°C)	Temperature difference (°C)
Card A (direct light)			
Card B (indirect light)			

1. Is light hitting the card from lamp A direct or indirect light?
2. Is light hitting the card from lamp B direct or indirect light?
3. Which card has the hottest final temperature? Why is this?

EVALUATION:
How could you have improved this experiment?

CONCLUSION:
1. What do you conclude about the heating effects of direct and indirect light?
2. Why do you think this is the case?

QUESTIONS

Imagine that the lamps represent sunlight and the cards represent the surface of the Earth.

1. What season on Earth do you think corresponds to case A, and why do you think this?
2. What season on Earth do you think corresponds to case B, and why do you think this?

6. SUGGESTED WEIGHTING OF MARKS FOR TESTS AND EXAMINATIONS

6.1 Grade 7 Mid-Year Examinations

	Topics	Cognitive levels			Allocated Time in CAPS	Suggested mark allocation
		Low (40%)	*Middle (45%)*	*High (15%)*		
TERM 1	The Biosphere				1 week	4
	Biodiversity				3½ weeks	12
	Sexual Reproduction				3½ weeks	12
	Variation				1 week	4
TERM 2	Properties of materials				2 weeks	7
	Separating mixtures				2 weeks	7
	Acids, bases and neutrals				2 weeks	7
	Introduction to the Periodic table of elements				2 weeks	7
	TOTAL	24	27	9	**17 weeks**	**60 marks**

6.2 Grade 8 Mid-Year Examinations

	Topics	Cognitive levels			Allocated Time in CAPS	Suggested mark allocation
		Low (40%)	*Middle (45%)*	*High (15%)*		
TERM 1	Photosynthesis and respiration				2 weeks	8
	Interactions and Interdependence within the environment				5 weeks	21
	Micro-organisms				2 weeks	8
TERM 2	Atoms				2 weeks	8
	Particle model of matter				5 weeks	21
	Chemical reactions				1 week	4
	TOTAL	25	32	13	**17 weeks**	**70 marks**

6.3 Grade 9 Mid-Year Examinations

	Topics	Cognitive levels			Allocated Time in CAPS	Suggested mark allocation
		Low (40%)	*Middle (45%)*	*High (15%)*		
TERM 1	Cells as the Basic unit of life				2 weeks	9
	Systems in the human body				2 weeks	9
	Human reproduction				2 weeks	9
	Circulatory and respiratory systems				1½ weeks	7
	Digestive system				1½ weeks	7
TERM 2	Compounds				1 week	4
	Chemical reactions				1 week	4
	Reactions of metals with oxygen				1½ weeks	7
	Reactions of non-metals with oxygen				1 week	4
	Acids & bases and pH value				1 week	4
	Reactions of acids with bases: Part I				1 week	4
	Reactions of acids with bases: Part III				½ weeks	2

	The general reaction of an acid with a metal hydroxide (base)				1 week	4
	Reactions of acids with bases: Part III				½ weeks	2
	Reactions of acids with metals				½ weeks	2
	TOTAL	32	36	12	**18 weeks**	**80 marks**

6.4 Grade 7 Final Examinations

	Topics	**Cognitive levels**			**Allocated Time in CAPS**	**Suggested mark allocation**
		Low (40%)	*Middle (45%)*	*High (15%)*		
TERM 3	Sources of energy				1 week	4
	Potential and Kinetic Energy				2 weeks	7
	Heat Transfer				2 weeks	7
	Insulation and Energy saving				2 weeks	7
	Energy transfer to surroundings				1 week	4
	The National electricity supply system				1 week	4
TERM 4	Relationship of the Sun to the Earth				4 weeks	14
	Relationship of the Moon to the Earth				2 weeks	7
	Historical development of Astronomy				2 weeks	7
	TOTAL	24	27	9	**17 weeks**	**60 marks**

6.5 Grade 8 Final Examinations

	Topics	Cognitive levels			Allocated Time in CAPS	Suggested mark allocation
		Low (40%)	*Middle (45%)*	*High (15%)*		
TERM 3	Static electricity				1 week	4
	Energy transfer in electrical systems				3 weeks	12
	Serial and parallel circuit				2 weeks	8
	Visible light				3 weeks	12
TERM 4	The Solar System				3 weeks	12
	Beyond the Solar System				3 weeks	12
	Looking into space				2 weeks	8
	TOTAL	28	32	10	**17 weeks**	**70 marks**

6.6 Grade 9 Final Examinations

	Topics	Cognitive levels			Allocated Time in CAPS	Suggested mark allocation
		Low (40%)	*Middle (45%)*	*High (15%)*		
TERM 3	Forces				2 weeks	9
	Electric cells as energy systems				½ weeks	2
	Resistance				1 week	5
	Series and parallel circuits				2 weeks	9
	Safety with electricity				½ weeks	2
	Energy and the national electricity grid				1 week	5
	Cost of electrical power				2 weeks	9
TERM 4	The earth as a system				1 week	5
	Lithosphere				2 weeks	9
	Mining of mineral resources				2 weeks	9
	Atmosphere				2 weeks	9
	Birth, life and death of stars				1 week	5
	TOTAL	32	36	12	**17 weeks**	**80 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. ***k*ey**
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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