basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

Curriculum and Assessment Policy Statement: Technical Occupational Year 2 - 4

LIFE SKILLS:

NATURAL SCIENCES

CONTENT

SECTION 1:

INTRODUCTION TO THE CURRICULUM AND ASSESSMENT POLICY STATEMENT: TECHNICAL OCCUPATIONAL

1.1 Background

The South African Constitution, Act 108 of 1996, enshrines the right of every child to access quality basic education without there being any form of discrimination. There are learners participating in the General Education and Training Band who have an interest and talent in applied knowledge and in technical and vocational skills subjects which are currently not available in the National Curriculum Statement, Grades R to 12 (2011). This cohort of learners should be given an opportunity to achieve a formal qualification or recognition of achievement towards a qualification that is related to any vocational and occupational learning within their area of interest and aptitude.

This Subject Statement has been developed to respond more effectively to the needs of these learners who have been identified and assessed through the protocols approved by the Department of Basic Education and who will benefit from curriculum content that is aligned to the Senior Phase of the National Curriculum Statement at a more applied and functional level in accordance with their interest and aptitude.

It is critical, that through differentiated methodologies, the learners enrolled for this qualification will be able to progress with regard to applied competencies, even where they might not be able to attain the minimum theoretical requirements of the respective grades of the senior phase. There should always be high expectations for all learners and the necessary scaffolding and learning support to master foundational competencies (language and numeracy) relevant to the specific subject, so that they are in a position to demonstrate the practical competencies that they have mastered which will make it possible for them to progress to further education and training pathways.

The learning programme will be structured in such a way that it would adequately prepare learners to progress onto the academic, technical vocational or technical occupational pathways of the Further Education and Training Band, albeit with endorsement. It will also enable learners across the range of competencies and aptitudes to obtain a recognised and accredited qualification or certificate of attainment.

The programme aims at contributing to the ideal of education to produce learners who will function **meaningfully** and **effectively** in the society, be able to enter future **careers** and be equipped to meet the requirements of the **economy** (local and global).

1.2 Overview

Through the policy document the Minister of Basic Education will be able to prescribe the minimum norms and standards for technical occupational education in the General Education and Training band.

The following legal framework will be adhered to:

(i) National Curriculum Statement, Grades R to 12 (2011) together with the National Protocol for Assessment and the National Policy pertaining to the Programme and Promotion Requirements of the National Curriculum Statement, Grades R to 12;

(ii) Draft Technical Vocational Subject Statements listed in the Draft General Certificate of Education: Technical Occupational, a Qualification at Level 1 on the National Qualification Framework;

(iii) General and Further Education and Training Quality Assurance Act, 2001 (Act No.58 of 2001); the General and Further Education and Training Amendment Act, 2008 (Act No 50 of 2008); the NQF Act, 2008 (Act no 67 of 2008) and the Continuing Education and Training Act, 2006 as amended by Act No 3 of 2012 and Act No 1 of 2013;

(iv) The General and Further Education and Training Qualifications Sub- Framework (August 2013);

(v) Standards and quality assurance for General and Further Education and Training (June 2008, Revised April 2013);

(vi) Policy and regulations pertaining to the conduct, administration and management of assessment for the General Education and Training Certificate in Skills and Vocational Training: A qualification at Level 1 on the National Qualification Framework (NQF);

(vii) Education White Paper 6 on Special Needs Education: Building an Inclusive Education and Training System (2001);

(viii) The United Nations Convention on the Rights of Persons with Disabilities adopted by the United Nations General Assembly on 13 December 2006 and ratified by the South African parliament on 5 June 2007;

(ix) The White Paper on the Rights of Persons with Disabilities, 2015;

(x) Section 11 of the Children's Act (2007);

(xi) Chapter 5, section 76 of the Children's Act as amended (2007);

(xii) Umalusi's Quality Assurance of Assessment: Directives, Guidelines and Requirements;

(xiii) Skills Development Act, 1998 (Act 97 of 1998); and

(xiv) Assessment Policy for Qualifications and Part Qualifications on the Occupational Qualifications Sub-Framework (OQSF), 2014 of the QCTO.

1.3. General Aims of the Technical Occupational Curriculum

(a) The National Curriculum Statement, Grades R to 9 gives expression to the knowledge, skills and values worth learning in South African schools. The Technical Occupational Curriculum aims to ensure that learners, irrespective of their abilities, have the opportunity to develop competences for meeting challenges and taking up opportunities in the fast changing 21st century and are also guided to apply knowledge and skills in ways that are meaningful to their own lives. In this regard, the curriculum promotes knowledge in local contexts, while being sensitive to global imperatives, including the demands of the fourth industrial revolution. Sustaining development-relevance in the face of constant and rapid change requires curricula to be lifelong learning systems in their own right, capable of constant self-renewal and innovation.

(b) The curriculum serves the purposes of:

- Equipping learners, irrespective of their socio-economic background, race, gender, physical ability or intellectual ability, with the knowledge, skills and values necessary for self-fulfilment, and meaningful participation in society as citizens of a free country;
- Promoting critical thinking, creativity and innovation, communication, collaboration, information, media and ICT literacies, flexibility and adaptability, initiative and self-direction, social and cross-cultural, productivity and accountability, leadership and responsibility and life-long learning;
- Facilitating the transition of learners from education institutions to the workplace;
- Providing employers with a sufficient profile of a learner's competences.
- Being sensitive to issues of diversity such as poverty, inequality, race, gender, language, age, and other factors;
- Valuing indigenous knowledge systems: acknowledging the rich history and heritage of this country as important contributors to nurturing the values contained in the Constitution; and
- Credibility, quality and efficiency: providing an education that is comparable in quality, breadth and depth to those of other countries.

(c) The curriculum is based on the following principles:

- Social transformation: ensuring that the educational imbalances of the past are redressed, and that equal educational opportunities are provided for all sections of the population;
- Active and critical learning: encouraging an active and critical approach to learning, rather than rote and uncritical learning of given truths;
- High knowledge and high skills: the minimum standards of knowledge and skills to be achieved at each grade are specified and set high, achievable standards in all subjects;

- Progression: content and context of each grade shows progression from simple to complex; and
- Human rights, inclusivity, environmental, gender and social justice and equality: infusing the principles and practices of social justice and human rights as defined in the Constitution of the Republic of South Africa as well as the greening of the economy.

(d) Inclusivity should become a central part of the organisation, planning and teaching at each school. This can only happen if all teachers have a sound understanding of how to recognise and address barriers to learning, and how to plan for diversity. The key to managing inclusivity is ensuring that barriers are identified and addressed by all the relevant support structures within the school community, including teachers, District-Based Support Teams, School-based Support Teams, parents and Special Schools as Resource Centres. To address barriers in the classroom, teachers should use various curriculum differentiation strategies such as those included in the Department of Basic Education's Guidelines for Responding to Learner Diversity in the Classroom (2011), as well as the Standard Operating Procedures for Accommodations in Assessment (2016).

The aims of the General Certificate of Education: Technical Occupational

The specific aims of the qualification are to:

- Give recognition to learners who would meet the requirements and achieve the competencies as specified in the Exit Level Outcomes and associated Assessment Criteria as set out in the GFETQSF along differentiated pathways;
- Provide a foundation of quality, standardised general education which will suit the needs of these learners and help prepare them for life after school and enable them to access particular employment or occupational workplace-based learning. It may also enable the learners to access a vocational qualification at a Technical and Vocational Education Training College;
- Promote Lifelong learning to enable learners to continue with further learning and skills development in the workplace;
- Prepare learners to function better in a fully inclusive society and workplace; and
- Provide employers with a profile of the learner's competence.

Learners successfully completing the qualification will be able to:

- Identify, select, understand and apply knowledge to the intended purpose and identify solutions to problems in the field of study;
- Demonstrate the necessary applied knowledge and skills identified for competence in a subject, as specified in the subject statement;

- Demonstrate knowledge and skills gained for purpose of formal communication and basic numerical operations;
- Have the ability to apply knowledge and skills in changing contexts;
- Reflect on their learning in order to promote an interest in learning and further study; and
- Demonstrate basic entrepreneurial skills that will enable them to create their own work and business opportunities in the contexts in which they live.

1.4. Subjects and Time Allocation

Instructional Time for the Technical Occupational Learning Programmes is 27½ hours in a five-day cycle

<table>
<tr><th colspan="2">Subjects

General Education</th><th colspan="2">Time</th></tr>
<tr><td colspan="2" rowspan="2">Languages
(Home Language and First Additional Language)

All 11 official languages (Afrikaans, English, isiNdebele, isiXhosa, isiZulu, Siswati, Sesotho, Setswana, Sepedi, Tshivenda, Xitsonga)</td><td colspan="2">3 Hours for Home Language</td></tr>
<tr><td colspan="2">2 hours for First Additional Language</td></tr>
<tr><td colspan="2">Mathematics</td><td colspan="2">3 hours</td></tr>
<tr><td rowspan="4">Life Skills</td><td>Personal and Social Well-being
(including aspects of Life Orientation, Social Sciences and Economic and Management Sciences)</td><td>2½ hours</td><td rowspan="4">6 hours</td></tr>
<tr><td>Physical Education</td><td>1 hour</td></tr>
<tr><td>Creative Arts</td><td>1 hour</td></tr>
<tr><td>Natural Sciences</td><td>1½ hours from year 2 onwards
This time to be used in year 1 to support Languages and Mathematics</td></tr>
<tr><td colspan="4">Information Communication Technology
ICT is a compulsory subject for all learners. It can be offered either as a stand-alone or integrated across various subjects. If offered as a stand-alone a school may use time allocated to the Technical Occupational programme. ICT does not count towards the qualification but is a necessary life-long skill. ICT is not to be confused with the Technical Occupational Subject “Office Administration” which is an elective.</td></tr>
</table>

Subjects **Technical Occupational: Electives**	**Time**
Agricultural Studies Art and Crafts Civil Technology: Bricklaying and Plastering Civil Technology: Plumbing Civil Technology: Woodworking and Timber Consumer Studies: Food Production Consumer Studies: Sewing Early Childhood Development Electrical Technology: Electrical Hospitality Studies Mechanical Technology: Body Works: Panel Beating and or Spray Painting Mechanical Technology: Motor Mechanics Mechanical Technology: Sheet Metal Work Mechanical Technology: Welding Mechanical Technology: Maintenance Office Administration Personal Care: Ancillary Health Care Personal Care: Beauty and Nail Technology Personal Care: Hairdressing Service Technology: Upholstery Wholesale and Retail	13½ hours
Total: General and Occupational	27½

The table below proposes the learner progression across the years at a School of Skills.

Year 1 Minimum of 1 year of orientation	**Year 2**	**Year 3**	**Year 4**
Base Line Assessment for Language and Mathematics ➢ **Intervention (ISP)** **General Education:** • **Home Language** • **FAL** • **Mathematics** • **Life Skills:** ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts ➢ ICT Enrichment **Technical Occupational** **Minimum 2 x SKILLS** **Across the year** **Post Assessment** • **Analyse results** Progress to Year 2 with appropriate support for Languages and Mathematics	**General Education:** • **Home Language** • **FAL** • **Mathematics** • **Life Skills:** ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts ✓ Natural Sciences ➢ ICT Enrichment **Technical Occupational** **Minimum of 1 Skill**	**General Education:** • **Home Language** • **FAL** • **Mathematics** • **Life Skills:** ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts ✓ Natural Sciences ➢ ICT Enrichment **Technical Occupational** **Minimum of 1 Skill**	**General Education:** • **Home Language** • **FAL** • **Mathematics** • **Life Skills:** ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts ✓ Natural Sciences ➢ ICT Enrichment **Technical Occupational** **Minimum of 1 Skill** GCE: TO Qualification Or Certificate of Achievement (External exam- results verified / moderated)

Note:

Year One is an orientation year and learners must be exposed to a minimum of two occupational skills so that they can select a skill with which they will continue from Year Two. Schools that offer more than the minimum two skills in Year One may adapt the Annual Teaching Plan for Year One to accommodate their rotation system to expose learners to more skills e.g. schools may offer a skill per term for Terms 1, 2 and 3 and learners then select the skill they will specialise in and start it in Term 4. It is important that learners in Year One experience the core competencies of the skills so that an informed choice can be made.

Years Two, Three and Four are the critical years for learners. It is important that learners are exposed to all the Topics and Specific Aims per selected Occupational skill, acknowledging that not all learners will be successful in all of these.

SECTION 2:

INTRODUCTION TO NATURAL SCIENCES

Science as we know it today has roots in African, Arabic, Asian, European and American cultures. It has been shaped by the search to understand the natural world through observation, testing and providing of ideas, and has evolved to become part of the cultural heritage of all nations. In all cultures and in all times, people have wanted to understand how the physical world works and have needed explanations to satisfy them.

2.1 What is Natural Sciences?

Natural Sciences is part of a selection of study areas that make up the Life Skills Learning Programme as specified for the GCE TO qualification. Science is a systematic way of doing investigations through applying scientific knowledge to find explanations for phenomena. It is the **understanding of how things work in the world around us** and also support the learners to **understand their responsibility towards themselves, others and the environment**. It has a **direct link** with the **knowledge and skills taught in** various vocational subjects. When teaching Natural Sciences teachers must use the relevant occupational skills workshops as a context when addressing science content or scientific investigation skills. **The content in Natural Sciences is organised under the follow four knowledge strands; Life** and Living, Matter and Material, Energy and Changes, and Planet Earth and Beyond

Goal	Pursuit of new knowledge and understanding of the world around us and of natural phenomena
Focus	Focus is on understanding the naturalworld
Developmental methods	Discovery through carrying out investigations
Major processes	Investigative and logical processes • planning investigations • conducting investigations and collecting data • evaluating data and communicating findings
Evaluation methods	Analysis, generalisation and creation of theories

Natural Sciences is not offered as a subject in year 1.

2.2 Topics to be studied in Natural Sciences (Natural Sciences is NOT offered in year 1.)

	Year 2		**Year 3**		**Year 4**	
TERM 1	TOPIC	TIME IN WEEKS	TOPIC	TIME IN WEEKS	TOPIC	TIME IN WEEKS
Life and living	Living and non-living things	3 weeks	Digestive system	3 weeks	Sense Organs	2weeks
	Structure of plants	2 weeks	Nutrients in food	2weeks	Human skeleton	2weeks
	Structure of animals	2 weeks	Nutrition	1 week	Human Reproductive System	4weeks
	What plants need to grow	1 week	Food processing	2 weeks		
Assessment		2 weeks		2 weeks		2 weeks
TERM 2						
Mater and Materials	Phases of matter	3 weeks	Mixtures	2 weeks	Acids and bases	3weeks
	Metals and non-metals	3 weeks	Solutions as special mixtures	2 weeks	Process to purify water	3weeks
	Processing material	2 weeks	Dissolving	2 weeks	Impact of weather on matter and materials.	2weeks
			The water cycle	2 weeks		
Assessment		2 weeks		2 weeks		2 weeks
TERM 3						
Energy and Change	Energy	2 weeks	Energy and Temperature	2 weeks	Electric circuits	2 weeks
	Energy Sources	2 weeks	Stored energy in fuels	1 week	Systems to solve problems	2 weeks
	Energy Transfer	2 weeks	Burning Fuels and safety with fire	2weeks	Mains electricity	2 weeks
	Sound and Noise pollution	1 week	Energy and Electricity	2 weeks	Saving Cost of Generating Electricity	1 week
Assessment		2weeks		2 weeks		2 weeks
TERM 4						
Planet Earth and Beyond	Planet Earth	4 weeks	Movements of the Earth and Planets	5 weeks	Revision	4 weeks
	The Sun	2 weeks	Systems for looking into Space	2 weeks		
	The Moon	1 week				
Assessment		2 weeks		2 weeks		

2.3 Specific Aims:

There are **three** Specific Aims in Natural Sciences.

Specific Aim 1: 'Doing Science'

Learners should be able to complete investigations, analyse problems and use practical processes and skills in designing and evaluating solutions.

Specific Aim 2: 'Understanding and Connecting Ideas'

Learners should have a grasp of scientific, technological and environmental knowledge and be able to apply it in new contexts.

Specific Aim 3: 'Science, Technology and Society'

Learners should understand practical uses of Natural Sciences in society and the environment and have values that make them caring and creative citizens.

Major Process Skills to be taught in Natural Sciences

- Accessing and recalling information – being able to use a variety of sources to acquire information, and to remember relevant facts and key ideas, and to build a conceptual framework
- Observing – noting in detail objects, organisms and events
- Comparing – noting similarities and differences between things
- Measuring – using measuring instruments such as rulers, thermometers, clocks and syringes (for volume)
- Sorting and classifying – applying criteria in order to sort items into a table, mind-map, key, list or other format
- Raising questions – being able to think of, and articulate relevant questions about problems, issues, and natural phenomena
- Predicting – stating, before an investigation, what you think the results will be for that particular investigation
- Hypothesizing – putting forward a suggestion or possible explanation to account for certain facts. A hypothesis is used as a basis for further investigation which will prove or disprove the hypothesis
- Planning investigations – thinking through the method for an activity or investigation in advance. Identifying the need to make an investigation a fair test by keeping some things (variables) the same whilst other things will vary
- Doing investigations – this involves carrying out methods using appropriate apparatus and equipment, and collecting data by observing and comparing, measuring and estimating, sequencing, or sorting and classifying. Sometimes an investigation has to be repeated to verify the results.

- Recording information – recording data from an investigation in a systematic way, including drawings,
- Descriptions, tables and graphs
- Interpreting information – explaining what the results of an activity or investigation mean (this includes reading skills)

2.4 Requirements for Natural Sciences as a subject

2.4.1 Time Allocation

The total number of hours allocated for Natural Sciences as part of the Life Skills Learning Programme is 1hour and 30 minutes in a five-day cycle.

The table below provides the time allocated and mark weighting for the different study areas.

Study Areas	**Time allocation per week**	**Time allocation per year and % weighting**			
		Year 1	**Year 2**	**Year 3**	**Year 4**
Personal Well-being	2½ hours	100 hours 60%	100 hours 50%	100 hours 50%	75 hours 50%
Physical Education	1 hour	40 hours 20%	40 hours 15%	40 hours 15%	30 hours 15%
Creative Arts	1 hour	40 hours 20%	40 hours 15%	40 hours 15%	30 hours 15%
Natural Sciences	**1½ hours**	**x**	**60 hours 20%**	**60 hours 20%**	**45 hours 20%**
Total	4 ½ hours Y1 6 hours Y2-4	180 hours	240 hours	240 hours	180 hours
Weeks		40	40	40	40

2.4.2 **Resources**

Resources needed for teaching Natural Sciences are listed against each topic in order to assist teachers with planning and preparation. The list is a guide and suitable alternative tools and materials may be used. Every learner must have his/her own textbook. Teachers should ensure that a system is in place for recovering textbooks at the end of every year. Schools must provide secure storage space where textbooks and other equipment can be stored safely.
Ideally every learner should have access to sufficient workplace and equipment to carry out investigations. All safety measurements must be in place in the classrooms when doing investigations and experiments with learners.

With regard to equipment, schools must make every effort to ensure that the essential equipment is provided. Tools, apparatus, material, and consumables must be acquired through a planned budgeting process.

While it is acknowledged that it is not ideal to have to improvise when using equipment, teachers should remember that it is more important for learners to have the experience of carrying out a variety of investigations than to depend on the availability of equipment. In instances where equipment is limited, teachers should be encouraged to improvise. The same skills can be developed using improvised equipment.

The Natural Sciences classroom should be equipped with charts, hand lenses, bio-viewers and relevant bio-strips, reference books, scissors, models, field guides, Identification keys, glass beakers, and if at possible access to appropriate DVDs, DVD player, Internet and data projector.

A selection of simple Science equipment such as glass beakers, test tubes, spirit or bunsen burners, thermometers should also be acquired. Consumable chemicals for practical investigations and experiments should be replenished when necessary.

Fresh plant material can be obtained from the surroundings and teachers should ensure that appropriate plants (e.g. Impatiens) are planted on the school grounds. Teachers must familiarise themselves with the subject content and how to use equipment.

2.4.3 **Infrastructure, equipment and finances**

Schools must ensure that teachers have the necessary infra-structure, equipment and financial resources for quality teaching and learning.

Infrastructure

Each class must have a basin and water supply available. The classroom should provide an opportunity for conducting experiments and group work.

Finances:

Budget and inventory

A budget must be allocated for the subject. The amount will be determined by the number of learners taking the subject across all the years and the nature of the practical work required as stipulated in the curriculum. The budget needs to be revised annually and must consider all resources needed per year. The funding must make provision for maintenance of equipment and the replacement over the years.

A stock inventory must be maintained by the teacher and verified annually by a Senior Management Team member.

2.5 **Career opportunities**

Teachers must highlight the links between Natural Sciences as a subject and other subject like Life Skills and all the Occupational subjects offered at the school.

SECTION 3:

OVERVIEW OF TOPICS PER TERM AND ANNUAL TEACHING PLANS

3.1 Content Overview

STRANDS	Year 2	Year 3	Year 4
Life and living	**Living and non-living things** **Living things** • Identify and explain • Briefly explain the seven life processes **Non-living** • Identify • Explain why things are non-living **Practical: Living and Non-living things**	**Digestive system** • Explain concepts • Describe structure • Name the parts and the organs • Describe the features and functions of the parts and organs	**Sense Organs** **Senses** • Briefly define concepts • Name and describe animal senses adapted for survival
	Structure of plants • Describe the basic structure of plants • Identify differences between plants	**Nutrients in food** **Food Groups** • Briefly define concepts • Categorise food • Describe the functions of food groups	**Human skeleton** • Briefly define concepts • Function of bones
	Structure of animals • Describe the basic structure of animals • Identify differences between animals	**Nutrition** • Explain a balanced diet	**Human Reproductive System** **Reproduction** • Introduce and explain concepts with examples • Explain the physical changes • Explain the features in the human organisms
	What plants need to grow • Explain requirements to growth • Explain how plants grow from cuttings and seeds	**Food processing** • Explain concepts, importance of preserving, types of products, methods and benefits	

Matter and Materials	**<u>Phases of matter</u>** **Solids, liquids and gases** • Briefly define and describe three phases • Distinguish between phases • Describe the properties	**<u>Mixtures</u>** • Briefly define concepts • Distinguish between pure substances and mixtures • Separating of mixtures (demonstrate)	**<u>Acids and bases</u>** • Briefly define concepts • Describe difference between acids and bases • Test various household substances with blue and red litmus paper and sort them into acids, bases and neutrals **Practical activity**
	<u>Metals and non-metals</u> • Define concepts • Distinguish between metals and non-metals • Properties of metals and non-metals • Uses of metals and non-metals	**<u>Solutions as special mixtures</u>** • Ingredients of a mixture • Explain the difference between a mixture and solution • Describe the properties of a mixture	**<u>Process to purify water</u>** **Clean Water** • Introduce and explain concepts with examples • Importance of drinking clean water • Methods of cleaning water **Practical Investigation**
		<u>Dissolving</u> • Explain concept • Rate of dissolving **Practical investigation: Rate of dissolving**	**<u>Impact of weather, temperature and wind on matter and materials.</u>** • Impact of weather on materials • Ways to protect materials
	<u>Processing material</u> • Briefly define concepts • Explain processes to make new materials or products • List the properties of raw materials used to make new products **Practical: Demonstrate the changes of raw material**	**<u>The water cycle</u>** • Briefly define concepts • Describe the stages of the water cycle • Draw the water cycle and describe in your own words **Practical**	

Energy and Change	**Energy** • Explain concepts with examples • Different forms/types of energy	**Energy and Temperature** • Explain the concepts with examples • Describe how to read and use a thermometer • Describe how heating and cooling can change materials	**Electric circuits** • Define concepts • Explain when a circuit is complete • Conductors and Insulators
	Energy Sources • Explain concepts with examples • Categorise sources of energy into Renewable and Non-Renewable sources • Name the different energy sources	**Stored energy in fuels** • Explain concepts with examples • Explain how energy is stored in food • Discuss the Renewable and Non-renewable sources	**Systems to solve problems** • Identify different circuits • Make simple electrical systems
	Energy Transfer • Explain were the energy from food comes from • Describe how energy is transferred in a food chain • Identify different types of energy transfer	**Burning Fuels** • Investigate, compare & describe how different fuels burn: Example candle **Safety with fire** • Identify sources • Identify safety rules when using fuels	**Mains electricity** • Describe concepts with examples • Compare the amount of energy released by different energy sources
	Sound and Noise pollution • Explain the concept sound with different examples • Explain sound as noise pollution and the impact on the environment	**Energy and Electricity** • Briefly define concepts • List the different types of batteries and its uses	**Saving Cost of Generating Electricity** • Explain concepts with examples • Describe energy sources and usage in South Africa • Compare different electrical appliances

<table>
<tr>
<td rowspan="3">Planet Earth and Beyond</td>
<td><u>Planet Earth</u>

• Explain concepts with examples
• Describe the features of the Earth
• Describe the Earth as a planet in space</td>
<td><u>Movements of the Earth and Planets</u>

• Explain concepts with examples
• Day and Night rotation
• The Moon</td>
<td rowspan="3">Revision of term 1 to 3</td>
</tr>
<tr>
<td><u>The Sun</u>

• Describe the unique features of the Sun
• Describe and compare the size of the Sun to that of the Earth</td>
<td rowspan="2"><u>Systems for looking into Space</u>

• Explain how people travel into space
• Describe how telescopes are used to look into space
• Describe the largest telescope build and used by South Africa</td>
</tr>
<tr>
<td><u>The Moon</u>
• Describe the unique features of the moon</td>
</tr>
</table>

3.2 **Content outline per term**

Year 2 Term 1

WEEK	TOPIC	CONTENT	Techniques, activities, resources and process notes
1 - 3	Living and Non-living things that share the world with us	**Living things** • Identify and explain different kinds of living things • Explain all seven life processes: feeding, growing, reproducing, respiration, excreting, sensing, and moving carried out by living plants and animals • Explain with examples why some things appear to be dead but will come alive, given the right conditions, e.g. dried yeast, and dried beans, an incubated fertilised egg. Explain why some things were living and are now dead: e.g. dead wood/leaves.	**Note to the teacher:** **These are only suggested activities, resources and process notes:** **Step 1:** Identify and explain the seven (7) life processes. • Teacher holds up two objects, one living and the other non-living (e.g. a stone, an animal/plant or pictures). Ask the learners to compare living and non-living organisms • Teacher could make notes of learner's ideas and contributions. • These are basic definitions of the following concepts: • Non-living: Do not grow, do not move and they do not reproduce. • Living: Things that are alive and active. They move grow and respond to stimuli • Feeding: Food is used to provide energy for living organisms. Green plants make their own food using sunlight. People and animals eat plants and/or other animals. • Growing: Babies grow into adults and seedlings grow into plants. • Reproducing: Animals and people have babies while new plants grow from seeds. • Breathing: Plants, animals and people use the oxygen in the air to turn food into energy.

		Non-living things • Identify and explain different kinds of non-living things: • Explain why some things were living and are now dead: e.g. dead wood, dry leaves. **Practical activity:** Identify and explain the seven life processes of any living organism.	• Excreting: Waste substances must be removed from the body. Plants, animals and people need to get rid of waste gases and water. Sensing: All living things respond to changes or notice changes in their surroundings and react to them. Movement: Living things like animals and people move their whole bodies to get from one place to another, plants turn towards the light and their roots grow down into the soil. **Step 2:** Learners describe (write short notes on the board) the life processes of living organisms. Teacher ensures that all the concepts of the seven life processes are explained and understood. There are excellent visual resources available on You Tube. **Step 3:** • Learners go outside onto school grounds to write down a list of living and non-living things. • In their groups they check each other's lists (peer assessment) and discuss. The learners could formulate a definition for living and non-living things. (If needed give guidance) **Step 4:** • Learners are guided to germinate seeds providing warmth and moisture. It is advised to start germinating seeds during week 1: include this as an observation of the seven life processes. • Growing yeast (in warm water with sugar)

			Step 5: • Learners are guided to look at pictures of hatched eggs and discuss conditions of hatching (warmth) • In closing: The teacher describes the life processes that all living organisms have. Practical activity: This is just a suggestion Choose any living organism and make a poster to illustrate the seven life processes. Resources: Examples and pictures of living and non-living things, including plants, animals, bread, mould, seeds, water, cotton wool, bucket, soil, yeast, pictures of hatched eggs.

4 -5	Structure of plants	**Features of plants** • Explain the following concepts with examples: roots, stems, leaves, flowers, fruits, seeds. • Describe the basic structure of plants: roots, stems, leaves, flowers, fruits, seeds • Identify visible differences and similarities between plants: e.g. small, large, grow in water or soil, produce fruits, flowers; thick/thin/large/small leaves etc. **Practical demonstration:** Learners must touch, smell and observe the differences in plant structures.	These are only suggested activities, resources and process notes: These are basic definitions of the following concepts: • Roots: It is the part of the plant that is usually hidden underground. They hold the plant in the ground and keep it upright. It absorbs water and food from the soil. • Stems: The part of the plant that bears branches, leaves, flowers and fruits. It transports water and minerals from the roots to the leaves. • Leaves: Provide trees with all their food because they turn sunlight into food energy. Leaves also make oxygen in the air that we breath. • Flowers: Flowers are usually the beautiful part of the plant. The colour and fragrance attracts insects and bird which play an important role in the reproductive process. • Fruits: Are the fleshy structure of certain plants that may be edible in the raw state, for example apples. Seeds: Plants grow from seeds when the conditions are favourable. Seeds are small grains capable of producing a new plant **Step 1:** • Bring a variety of plants and pictures of plants to class. • Learners should identify similarities and differences. • Discuss their findings. • Teacher chooses two different plants, draw and label each plant and then compare things that are similar and things that are different between these plants. • Make a table of comparison between the similarities and differences of these two plants.

			Step 2: • **Practical demonstration:** Learners must touch, smell and observe the differences in plant structures. **Resources:** Pictures of plants, Examples of a variety of plants

6 - 7	Structure of animals	**Structure of Animals** Explain the following concepts with examples: Head, Tail, Body, Limbs, Sense organs, Body covering, Vertebrate, Invertebrate **Features of animals** • Describe the basic structure of animals: head, tail, body, limbs, sense organs, body covering, and vertebrate, invertebrate. • Identify visible differences between vertebrate and invertebrate animals.	**Note to the teacher:** These are only suggested activities, resources and process notes. These are basic definitions of the following concepts: ○ **Head**: It is the part of the animal that has a brain, sensory organs and feeding structures. ○ **Tail**: Most animals have a tail at the back of their body and have different functions for different animals for example monkeys, kangaroos, crocodiles, beavers, fish etc. ○ **Body**: All animals look different, for example long legs, short stubby claws, big eyes, thousands of tiny eyes together in one big eye. Animals come in all shapes and sizes. ○ **Limbs**: Animals can walk, run climb or swim using their limbs. Animals can have wings, webbed feet, tentacles, fins, legs, arms, flippers and long slippery bodies. ○ **Sense organs**: Some animals have senses that are much better developed than humans ,for example: excellent smelling, sharp eyes, excellent hearing, echolocation etc. ○ **Body covering**: Different animals need to cover their bodies in different ways. It protects the animals' organs, bones and muscles from the environment. It also helps animals to blend into their environment (camouflage). ○ **Vertebrate**: Animals with a backbone. ○ **Invertebrate**: Animals without a backbone.

			Step 1 • Bring a variety of animal pictures to class/make use of visual resources for example You Tube. **Step 2:** • Learners should be able to label the parts of at least one vertebrate and one invertebrate animal. • Learners should describe the visible differences between at least three animals applicable to their environment. **Resources:** Visual resources for example pictures, internet etc.
8	What plants need to grow	**Requirements for growth of plants** • Explain the requirements needed by plants to grow: light, warmth, water, gases and fertile soil. • Explain and demonstrate how new plants can be grown from cuttings or seeds. **Practical Investigation:** Growth of plants from seeds and cuttings.	**Step 1:** • **Practical Investigation** The growth of plants from seeds and cuttings. Observe, measure and record the growth over time and have a discussion over the findings. (**Guideline:** Plant the seeds or cuttings during week 2 and link it to the seven life processes) **Resources:** Seeds and cuttings, ruler and/or measuring tape, visual media.

9 -10	The weeks allocated for formal assessment are integrated across the term.

Formal Assessment:

- Practical: 50 %
- Test (Pen and Paper): 50 %

Year 2 Term 2

WEEK	TOPIC	CONTENT	Techniques, activities, resources and process notes
1-3	Phases of matter	**Solids, Liquids and gases** Briefly define concepts with examples: Solid, Liquid, Gas, Evaporation, Condensation, Freezing, Melting Demonstrate practically the 3 phases in which matter could be found (solids, liquids, gases) Distinguish between solids, liquids and gases with practical examples. Describe the properties of solids, liquids and gases. Describe and explore how matter can change into different phases through heating and cooling using different applicable materials.	**Note to the teacher:** Use as much visual examples as possible. These are only basic definitions to the following concepts: • **Solid**: Solids hold their shape. Solids could be hard, soft, big or small. • ***Liquid***: *Liquids flow and take on the shape of the container they are in.* • ***Gas***: *Gases are everywhere for example the atmosphere are gases that surrounds the Earth.* • ***Evaporation***: *When a liquid turns into a gas when heat is added.* • ***Condensation***: *When a gas cools down and forms a liquid.* • ***Freezing***: *When a liquid forms a solid when cooled.* • ***Melting***: *When a solid turns into a liquid when heat is added.* ***Step 1:*** *Demonstrate practically the 3 phases in which matter could be found (solids, liquids, gases).* ▪ *Introduce the terms solid, liquid and gas. Introduction could also be a* ***practical demonstration*** *by changing ice (solid) into water (liquid) and water into water vapour (gas) or vise versa. Through this demonstration, learners could see that the change was caused by freezing and boiling water which means there was a difference in temperatures.*

			Step 2: *Distinguish between solids, liquids and gases with practical examples.* ▪ *Use many examples of materials and ask learners to sort them into 3 groups (solid, liquid, gas) for example wood, stone plastic, fabric, water, juice, tea, air, cooking oil, cooking gas etc. Learners could now describe them.* ***Step 3:*** *Describe the properties of solids, liquids and gases. (There are excellent PowerPoints and videos available on You Tube)* *Solids: Particles are packed closely together. Particles cannot move but vibrate. Strong force of attraction keeps the particles together. Has a fixed shape and volume.* *Liquids: Small spaces between particles. Particles can move quickly but bump against each other. Force of attraction between particles is weaker than solids. Not easily compressible but takes on the shape of the container.* *Gases: Large spaces between particles. Particle can move quickly and easily. Force of attraction between particles is very weak. Gases are easily compressed and take up the shape of its container.*

			Step 4: *Describe and explore how matter can change into different phases through heating and cooling using different applicable materials.* • ***Demonstrate****: Evaporation, condensing, freezing and melting by using water and ice. Take examples of solids like chocolate, ice cream, ice. Ask the learners to predict: "What do you think will happen if we heat these things?"* • ***Demonstrate:*** *Melting and solidifying using different substances such as butter, fat, wax, ice cream, chocolate (refer to different workshops at school).* ***Examples:*** o *Solids turn to liquid when heated (gain energy)* o *Warm up jelly from the fridge. It melts and becomes a liquid, cool it and it becomes a solid again.* o *Heat 1 teaspoon of sugar until it melts it becomes a liquid, it solidifies again when cooled (makes a toffee)* o *Heat any liquid (milk, juice, water or any drink) it boils and turns into water vapour (gas).* o *Boil a liquid and hold a cold plate above the boiling liquid, droplets of liquid form on the plate (water vapour condenses)*

			Step 5: ▪ *Learners write about their observations in each experiment of the changes in phases.* ***Step 6:*** ▪ *Learners could identify and describe other examples of phase changes at home* *(e.g. cooking and baking or when welding in the garage).* ***Step 7:*** • *Assess the learners' knowledge. Can the learner:* o *Correctly explain how melting, solidifying (freezing), evaporation (boiling) and condensation take place.* o *Find and describe good examples of the above processes in everyday life or workshops at school.* ***Emphasise safety when working with heat.*** ***Resources:*** *Solid and liquid materials as used in examples chosen by teacher. A heating and cooling (freezing) resource.*

4-6	Metals and non-metals	**Properties of metals** Briefly define concepts: • Metals; Polymers; Ceramics Distinguish between metals and non-metals Name different materials in the immediate surroundings and describe their features (e.g. colour, texture etc.) Describe the properties of different classes of metals: • Appearance; Flexibility; Hardness; Shiny; Strength; Heat conduction Describe the properties of non-metals • Dullness; Can break easy; Heat conduction; Ability to rust Uses of metals and non-metals • Research and describe how metals and non-metals are used to make products for example furniture made in the workshops at school.	**Note to the teacher:** These are only suggested activities, resources and process notes: These are basic definitions you may use other resources: Make use of visual and practical examples in their surrounding area and workshops at school. • **Metals**: Are known for conducting heat well. They are strong, shiny and hard. Metals could be shaped without breaking or cracking. Examples: Copper, Aluminium, Zinc, Gold, Silver, Brass, Lead, Iron, Tin, Titanium etc. • **Polymers**: Many modern products are polymers. It is a synthetic compound. Examples: Nylon, Polyester, Polystyrene, Teflon, Plastic, Wool, Silk, Rubber etc. • **Ceramics**: Manufacturing of any product made from a non-metallic mineral like clay that is exposed to extremely high temperatures. Examples: Porcelain, Tiles, Bricks, Glass, Stoneware etc. **Step 1:** Distinguish between metals and non-metals • Teacher bring different objects to school and use examples in class for example a book, pencil, bottle, cup, spoon, plate, bowl, wood, iron, steel etc. Classify the objects into any two groups and explain their reasons for placing them in those groups. **Step 2:** Name different materials in their immediate surroundings and describe their features (e.g. colour, texture etc.) • Discuss the materials made of (paper, wood, metal, glass, ceramic, plastic) referring to the properties of materials: texture, strength, colour, flexibility, hardness and solubility**:** • **Investigate and compare:** Compare and record the properties of some metal objects (such as copper wire, coins, nails, cooking pots, knives and forks) and some non-metal objects (such as a piece of chalk, a stone, a pile

			Step 3: • Assess the learners' knowledge. Can learners: o Tell the difference between metal, glass, plastic, paper, wood and ceramics ect? o Describe the properties of metals and non-metals correctly? **Metals:** Solid and strong. Could be hammered or bent into different shapes (flexible). Shiny especially when they are new. Cold to touch. Excellent conductors of heat. Has the ability to rust/or become dull. **Non-metals:** Could be soft or flexible like rubber. Could be hard and brittle like glass. Do not have a silvery appearance but tend to be dull. Could be grouped into different categories: wood, rubber, plastics, and ceramicsetc. When you touch non-metals, they are neither cold nor hot. Not very good conductors of heat. Do not have the ability to rust.

			Step 4: • Demonstrate and discuss different ways to make old and dull materials look new/shiny again. Depending on the material the method will be different. Metals: Polish with a fine cloth/Rubbing with a paste made of pumice powder and water. Non-metals: Clean with a fine cloth/Wash with soap and water.

7-8	Processing material	**Briefly explain concepts:** • Combining, Mixing, Setting, Cooking/Heating, Cooling, Drying Explain that all materials can be processed to make new materials or products. Explain that in Africa people have processed materials e.g. clay pots and bricks etc. Explain that processed materials are useful because of their special properties: strong, durable, waterproof, different colours etc. List different products and list the different raw materials it is made of. **Practical: Activity** Demonstrate and explain processes used to change the properties of raw materials: • Mixing and setting • Mixing • Mixing and cooking	**Note to the teacher:** These are only suggested activities, resources and process notes: These are basic definitions you may use other resources: ○ **Combining**: The act of combining is to form a new substance. ○ **Mixing**: When 2 or more substances are added together. ○ **Setting**: Allowing the mixture time to cool down after a certain process. ○ **Cooking/heating**: Increase in temperature. ○ **Cooling**: Decrease in temperature. ○ **Drying**: Allowing the moisture or liquid to be evaporated from the mixture by increased temperatures (sunlight, wind, heating) Use as much visible examples as possible. You may use other examples and resources: **Step 1:** • Do a practical activity to introduce these concepts; the class could be divided into groups. Each group could get a specific method of processing material. Materials such as plaster, sand, gravel, cement, flour, water, ingredients to make dough, jelly powder, wet clay, etc. could be used. • When the learners have finished you could ask the learners: "Is the final product after processing a totally new product?" **Step 2:** • Show learners examples of processed materials in Africa for example baskets, hats, thatched roofs made from plant fibre such as grasses or reeds, clay pots and bricks.

		• Mixing and cooling	**Step 3:** • It is very important that learners understand the importance of processing materials (What are the special properties after processing for example strength, durability, waterproof, different colours etc. depending on example). **Step 4:** • Demonstrate and discuss that the process used could change the properties of raw materials: o Mixing and setting (Polyfilla and water makes plaster) o Mixing (Flour and water to make sticky paste/glue) o Mixing and Cooling (Jelly powder and water used to make Jelly) o Mixing and Cooking (Making dough) (**Hint:** Teacher could take photos of the ingredients before the processing took place and the final product after processing)
9 -10	The weeks allocated for formal assessment are integrated across the term.		
Formal Assessment: • Practical: 40 % • Test (Pen and Paper): 60 %			

Year 2 Term 3

WEEK	TOPIC	CONTENT	Techniques, activities, resources and process notes
1 - 3	Energy	Energy from the sun • Explain concepts with examples o Energy (What is energy?) o Energy source o Food as a source of energy o Energy transfer o Food chain • Identify the energy source in a food chain (sun) by using a simple food chain. • Food serves as a source of energy for plants and animals. Introduce learners to energy transfer between different components in a food chain. • Describe the organization of a simple food chain.	**Introduction** • Ask learners how would they feel during the day if they had no food to eat in the morning? (tired, sleepy, have no energy) • Ask learners how they would feel during the day if they had a proper breakfast? (good, have energy) **Now learners can make a conclusion:** YOU NEED FOOD TO HAVE ENERGY FOR DAILY ACTIVITIES! • What is energy? Energy is the ability to do work. • What was the source of energy in this example? The food. **Suggested Guideline** **Step 1:** • Show learners an example of a simple food chain. (Make use of resources such as You Tube or posters.) **Step 2:** • Use this example and break it down: o What provided the energy? The sun. o What absorbed the energy of the sun? The plants o What animal (Herbivore/Omnivore) ate the plants? Depending on example.

		○ Energy from the sun. ○ Producers (plants) ○ Users (Herbivore, Carnivores, Omnivores) ○ Decomposers	○ What happened next? The animals served as food for other animals. ○ Explain to the learner the different users: Herbivore, Carnivores and Omnivores.) ○ What is the final process of life? Death and bodies are then decomposed by decomposers. **Step 3:** Make use of a variety of different food chains. Learners could even design their own food chains.
4 - 5	Energy sources	**Energy Sources** Explain the following concepts with examples: • Energy sources • Renewable sources of energy e.g. sun, wind and water. • Non-renewable sources of energy e.g. coal, crude oil, natural gas, fuels. Discuss the classifications of both Renewable- and Non-Renewable sources of energy:	**Note to the teacher:** These are only suggested activities, resources and process notes. These are basic definitions of the following concepts: • **Energy source**: Supplies energy. • **Renewable**: Is generated from natural resources such as sunlight, wind, water and plants(biomass). These sources are renewable because they are quickly replenished and are usually available in a never-ending supply. • **Non-renewable**: Comes from sources that can't be replenished in a short period of time. We get most of our energy from non-renewable sources which include fossil fuels, oil, natural gas and uranium. **Prior knowledge:** What is energy? The ability to do work.

Step 1:

- Allow learners to name the different sources of energy.

Sun	Coal	Candles
Wind	Water	Paraffin
Fuel	Gas	Oil

Even secondary sources

Step 2:

- Discuss renewable- and non-renewable sources. There are excellent visual media available on You Tube.
- Allow the learners to classify the different sources mentioned above as renewable- or non-renewable sources.
- **Renewable sources:**

Wind: Wind is the movement of the atmosphere. Wind energy could be used to pump water or to generate electricity. Effective near coastal regions.

Water: Also known as hydropower. Hydro means water. Water power is one of the oldest known sources of energy in human history. Today it is often used to create electricity using dams.

Sunlight: Energy from the core of the sun used to convert sunlight energy to electrical energy.

			• **Plants (Biomass)**: Energy from plants. Usually the burning of trees (which) causes air pollution. Modern forms of biomass energy are used for automobile fuel and fueling electric power plants ○ **Non-renewable sources:** Fossil fuels: Sources that formed over 300 million years ago. Fossil fuels are made up of decayed plant and animal matter for example oil, natural gas and coal. **Uranium (Nuclear power):** Nuclear energy uses the power of the atom to create something very simple: steam power. It generates an incredible amount of power that is used to superheat water, converting it into steam which is then used to create electricity. Nuclear power generates waste that can be dangerous to human health and the environment. The waste takes a long time sometimes thousands of years to become safe. **Step 3:** ○ Discuss characteristics of renewable- and non-renewable resources. ○ Availability ○ Impact on environment. ○ How cost efficient is it? **Enrichment**: Do a poster or make a model

6 - 7	Energy transfer	**Energy around us** **Practical: Activity** Identify and demonstrate different types of energy transfer o Electrical energy to: o heat energy o light energy o sound energy o movement energy o Food energy to movement energy (Make use of a variety of examples) **Doing this work practical is very effective.**	**Guideline:** Use as much visual examples as possible. While learners are busy doing practical work make use of a worksheet so that the learners could write or discuss their findings. **Examples:** - battery powered radio (transfer is potential energy to sound energy) - electrical fan (transfer is electrical energy to movement energy) - Paraffin lamp (transfer is paraffin to heat energy) - solar light (transfer is sunlight into light energy) etc. **Enrichment:** Learners could make a model to illustrate any type of energy transfer.
8	Sound an noise pollution	**Noise pollution** • Briefly explain the following concepts with examples: - Sound; Vibrations; Noise pollution • Explain what noise pollution is and give practical examples in their environment.	**Guideline:** • Take learners to one of the workshops in school where there is a lot of noise pollution or make use of You Tube video clips of airports, factories and construction sites that causes noise pollution etc. • Ask the learners to discuss what they think noise pollution is, and then out of their discussions create a definition for noise pollution before consulting a book. Now explain the concepts mentioned to learners.

		Describe the danger of: • Loud sound • Sound to hearing	• These are basic definitions of the following concepts: o **Sound**: Sound is a vibration or wave that can be heard through a solid, liquid or gas. o **Vibration**: Sound comes from vibrations composed of frequencies capable of being detected by ears. o **Noise pollution**: Unwanted and annoying degree of sound in a particular area. **Step 1:** o Explain how sound travels from where it is made to where it is heard through vibrations. **Step 2:** **Investigation** • Explore making different sounds with different materials. (Tin, Hands, musical instruments, their voices etc.) Loud, Soft, Low and High **Step 3:** • Discuss the dangers of loud sound for people and animals with examples applicable to their surroundings. (Loud noise causes loss of hearing/partial deafness) • Ask learners if they could find solutions for certain situations identified by teacher. For example, what could be done in the workshop to help with noise pollution: Learners could wear ear plugs?

9 -10	The weeks allocated for formal assessment are integrated across the term.

Formal Assessment:

- Practical: 50 %
- Test (Pen and Paper): 50 %

Year 2 Term 4

WEEK	TOPIC	CONTENT	Techniques, activities, resources and process notes
1-4	Planet Earth	**Features of the Earth** Explain the following concepts with examples: • Earth, Habitats, Sun, Continent, Island, Planet, Moon, Star Describe the features of the Earth • Shape • Size • Movement • Ability to support life Describe the different features of habitats on the Earth. Explain the difference between a continent and an island. Identify the islands, oceans and continents on Earth – with their names. **Practical: Illustrate the Earth through a model or drawings** • Describe the Earth as a planet in space.	**Guideline:** • It is very effective to use visual resources in your teaching with these topics because it makes it easier for learners to grasp new concepts. For example You Tube , posters, pictures and models. • Construct a model of part of the Solar System, Sun, Earth, Moon showing the positions of the three bodies as well as their relative sizes not to scale. **Step 1:** These are only basic definitions to the following concepts: ○ **Earth:** The Earth is our home planet. It is the third planet from the Sun. The Earth consist of three parts called the Atmosphere (air), Hydrosphere (water) and the Lithosphere (surface/land). The Earth is the only planet that supports life. ○ **Habitats:** It is an environmental area where living things live for example human, plants, animals or other organisms. There is enough food, shelter, protection and mates for reproduction. ○ **Sun:** The sun is the only star at the centre of our solar system. It is the most important source of energy for life on Earth. The sun is a huge ball of fire shooting light and heat in all directions. ○ **Continent:** Is one of several very large landmasses on Earth. These are Asia, Africa, North America, South America, Antarctica, Europe and Australia. ○ **Island:** An island is a piece of land surrounded by water.

		• Describe how the Earth, Moon and Sun moves in space. Discuss the different ways to observe space from the Earth	○ **Planet:** A planet is an astronomical object that is massive enough to be rounded by its own gravity. There are eight planets in our solar system. ○ **Moon:** The moon is the Earth's only natural satellite. A satellite is anything that revolves around another larger object in space. The moons gravitational influence produces the ocean tides and the slight lengthening of the day. The moon revolves around the Earth. It has holes on it called craters formed by huge rocks from outer space that crashed into it. ○ **Star:** Clouds of dust and gas. **Step 2:** Describe the features of the Earth ▪ Shape: Spherical shape. ▪ Size: 12 756 km in diameter. ▪ Movement: The Earth revolves around the Sun in 365 ¼ days. ▪ Ability to support life: The Atmosphere has oxygen; temperatures are not to hot or to cold. Plants provide food. Two thirds of the surface is covered with water. • Discuss where on Earth would living organisms be found. (Habitats – Land, Water, Temperatures) • Explain the features of an Island and a continent with pictures and examples.

			Step 3 • Discuss the differences between an Island and a Continent Continents sit on continental lithosphere which is part of plates floating high on Earth's mantle. Islands are either extensions of the *oceanic crust for example volcanic islands or geologically they are part of some continent sitting on continental lithosphere for example Greenland. *Oceanic crust is part of the plates, but it is denser than continental lithosphere, so it floats low on the mantle. **Guideline:** The teacher takes the learners outside to observe the sun (safety measurements should be explained and applied)

5 – 6	The sun	Describe and discuss the unique features of the Sun: • Size, Movement, Distance from the Earth, Temperature, Composition, • How the sun support life on Earth	**Guideline:** • It is very effective to use visible resources in your teaching with these topics because it makes it easier for learners to grasp new concepts. For example, You Tube, posters, pictures and models. **Step 1:** • Facts about the Sun: Size: Diameter at the Sun's equator 1,5 million km (109 times the diameter of the Earth). The mass of the sun is about 333 000 times the mass of the Earth. The volume of the sun is about 1,3 million times the volume of the Earth. (This means you could put about a million Earths inside the moon) Movement: The eight planets evolve around the sun. The Sun is in the centre of our solar system. Distance from the Earth: About 150 million kilometres away from Earth. Temperature: The core of the Sun is 14 million ˚C. Composition: It is a massive ball of glowing gas. It is made up of hydrogen gas and helium gas. Hundreds of nuclear explosions take place every second and create a temperature of about 14 million ˚C. This creates enormous amounts of light and heat energy and makes the Sun appear to shine. **Step 2:** • How the sun supports life on Earth? There are four conditions needed to support life: Temperature: The Earth's average surface temperature is about 16 ˚C. Temperatures on the

			Earth's surface range between 71 ˚C to 90 ˚C temperatures suited for life. Water: Earth is the only planet that has water in a liquid form. Liquid water covers about 76 % of the Earth's surface. Sunlight: Sunlight provides energy to sustain the food chains on Earth. Plants convert energy from the sun into food. The plants are then eaten and the energy is transferred up the food chain. Oxygen: The Earth is the only planet that has oxygen in its atmosphere. Living things like plants and animals need oxygen to breathe and live.
7	Moon	Describe and discuss the unique features of the moon: ▪ Basic facts of the moon (Size, Distance from Earth etc.)	**Guideline:** It is very effective to use visible resources in your teaching with these topics because it makes it easier for learners to grasp new concepts. For example, You Tube, posters, pictures **Step 1:** • Basic facts about the moon: Size: The moon is about 3 476 km in diameter. It is airless, waterless and lifeless. Distance from Earth: The moon is about 384 000 km away from Earth. Movement: The moon orbits around the Earth. Surface: The moon has a rocky surface that is covered in craters formed by meteors that crashed into it.

8 -10	The weeks allocated for formal assessment are integrated across the term.

Formal Assessment:

- Practical: 40 %
- Test (Pen and Paper): 60 %

Year 3 Term 1

WEEK	TOPIC	CONTENT	Techniques, activities, resources and process notes
1-3	Digestive system	**The Digestive System** Explain concepts with examples: • Nutrition • Digestive system • Digestion • Indigestion • Organ of the digestive system Describe the structure of the digestive system Name the parts of the digestive system Describe the features and functions of the parts of the digestive system	**Guideline:** Use as much visible examples as possible. There are excellent resourcesavailable on You Tube for example: (https://www.You Tube .com/watch?v=JnzwbipJuAA) from KidsHealth. **Step 1:** • Explain concepts using examples o **Nutrition** (Food needed to keep growing organisms healthy) o **Digestive System** (System that breaks down the food you eat to make food absorbable into the body) o **Digestion** (Allows your body to get the nutrients and energy it needs from the food you eat) o **Indigestion** (Another name for an upset stomach, occurs when people eat too much, too fast, or food that don't agree with them. Stress, not enough sleep, smoking, drinking alcohol can make indigestion worse) o **Organs of the digestive system** (Mouth→Esophagus→Stomach→Small intestine→Pancreas→Liver→Galbladder→Largeintestine→Rectum→Anus) **Resources:** Pictures, Visual media or a model of the digestive system. **Step 2:** • Describe the structure of the digestive system (make use of visual resources for example a poster of the digestive system, You Tube etc.).

			Step 3: • Name and identify the parts of the digestive system • **Enrichment:** Learners could do an activity where they draw the parts of the digestive system very basic. Step 4: o Describe the features and functions of the parts of the digestive system: Mouth: Beginning of digestion, chewing breaks the food into pieces that are more easily digested.

			○ **Esophagus**: Receives food from your mouth when you swallow. Muscular contractions (peristalsis) delivers food to the stomach. ○ **Stomach**: Container that holds food while enzymes(acids)break food down in a usable form. When content of stomach is sufficiently processed they are released into small intestine. ○ **Small intestine**: 6.7 metres long muscular tube that breaks down food using enzymes released by Pancreas and bile from the liver. Once nutrients have been absorbed and leftover-food residue liquid have pass through the small intestine it then moves to the large intestine. ○ **Pancreas**: Secretes digestive enzymes into the small intestine. ○ **Liver**: Absorb nutrients from small intestine. Bile from the liver is secreted into small intestine and digests fat. ○ **Gallbladder**: Stores and concentrates bile and then releases to help absorb and digest fats. ○ **Large intestine**:1.8 metres long muscular tube thatconnects the small intestine to the rectum. Responsible for processing waste so that emptying of the bowels is easy and convenient. Stool passes through the large intestine by means of peristalsisfirst in a liquid state and ultimately in a solid form. ○ **Rectum**: Connects the large intestine to the anus. Disposing of stool and waste. ○ **Anus**: Last part of the digestive track.

4-5	Nutrients in food	**Food Groups** Briefly define concepts • Food pyramids • Food groups • Supplements • Fat • Nutrition • Water • Vitamins • Mineral • Carbohydrates • Protein Categorise food into proteins, carbohydrates, fats, oils, vitamins and minerals. Describe and discuss the functions and importance of various food groups in the body. **Practical activity:**	**Guideline:** Use as much visible examples as possible. For example, make poster/drawing of the food pyramid. **Step 1** • Explain concepts with examples from the food pyramid. **Step 2** • Introduce learners to the importance of healthy food. ○ **Healthy food** is food that will eventually go bad for example fruits, vegetables, dairy products and meats. ○ **Processed food** last longer but is unhealthy for example a bag of chips. A healthy diet includes the important nutrients: **Carbohydrates** (Most important source that provides energy), **Proteins** (Build-up, maintain and replace tissues in your body), Fats (help brain and nervous system to develop correctly. Examples of good fats are avocado, tuna, salmon and olive oil), Vitamins (helps you grow and develop like you should), **Minerals** (Calcium – build bones, **Iron** – deliver oxygen to blood and lungs), **Water** (Hydration – controls body temperature through sweating). **Step 3** **Practical activity:** • Learners could look for pictures of the five food groups and categorise them according to the food pyramid

			Enrichment activity: • Learners could look for pictures to make an unhealthy food pyramid. • **If possible,** learners could go to the Consumer Studies class and they could prepare a healthy meal for example a chicken salad which includes all these food groups. While learners are preparing the salad, the teacher could introduce them to the functions and importance of the food groups. **Or:** Discuss the feeding scheme menu at school.

6	Nutrition	Explain concepts of a balanced diet Discuss the benefits of a balanced diet Explain and discuss how malnutrition can lead to diseases **Practical: Learners must draw up a healthy menu for breakfast, lunch and supper for one day**	**Introduction:** Use two different menus or pictures of plates of food (breakfast, lunch, supper) and learners must identify which plates will represent a healthy or unhealthy diet. Learners must explain their answers. **Step 1:** What is a balanced diet? • A balanced diet contains the **correct quantities** of nutrients, from the basic food groups, that a person needs each day for healthy growth and activity. • In South Africa, the Provincial Health Restructuring Committee (PHRC) formulated a set of food-based dietary guidelines in May 2003. o Enjoy a variety of foods. o Be active. o Make starchy foods the basis of most meals. o Eat plenty of fresh fruit and vegetables. o Eat dried beans, peas, lentils and soya regularly. o You can eat chicken, fish, milk or eggs daily. o Eat fats sparingly. o Use salt sparingly. o Drink lots of clean safe water. o If you drink alcohol, drink sensibly.

			○ Use foods and drinks containing sugar sparingly and don't have them between meals. **Practical Demonstration:** • Learners could plan a healthy menu for one day which will include breakfast, lunch and supper. **Hint:** Give each learner 3 (three) small disposable plates and allow them to look for pictures of food that will present a balanced diet. Learners could paste these pictures on each plate. **Step 2:** • Discuss the benefits of a balanced diet: ○ you have more energy ○ maintain weight ○ health benefits **Step 3:** • What is malnutrition and how it can lead to diseases: ○ When a person does not get enough of certain nutrients. ○ Show learners images of children who are malnourished. Some diseases caused by malnourishment: Kwashiorkor (a lack of protein), anorexia nervosa (under-nutrition) etc.

7-8	Food processing	**Processing Food** Explain concepts: • Processing • Preserve • Artificial • Preservatives • Supplements Explain the importance and benefits of preserving food. Explain different methods of food preservation with examples.	**Introduction:** Take learners back in history: Why the need to preserve food? How the different cultures used these methods? **Step 1:** • Explain the concepts using practical examples For example: **Processing** (Usually refers to foods that are packaged in boxes, cans or bags. It is the transformation of raw ingredients into other forms. This involves activities like mincing, liquefication, or macerating.), **Preserve** (This involves the preventing of bacteria growth in other words methods to keep the food from going bad. There are many processes to preserve food), **Artificial** (Processed food often contain additive artificial flavouring and chemical ingredients.), **Preservatives** (Processed foods have at least one or two preservatives. Preservatives are used to be able to store food for a long period of time, to keep quality and flavour – these preservatives can cause health problems such as allergies or hyperactivity.), **Supplements** (A supplement is a product intended to add nutritional value to the diet, it is not food this may be found in a powder form, capsules etc. It is generally understood to include vitamins, minerals or fibre.) **Step 2:** • Explain the importance and benefits of preserving food o Food could be stored for long periods of time o Food is easy to store o Food wastage is reduced

			Step 3: • Explain different methods of food preservation with examples: Boiling, Drying, Refrigeration, Freezing, Salting, Sugaring, Smoking, Pickling, Canning or bottling, Pasteurization, Vacuum Packing
9 -10	The weeks allocated for formal assessment are integrated across the term.		
Formal Assessment: • Practical: 50 % • Test (Pen and Paper): 50 %			

Year 3 Term 2

WEEK	TOPIC	CONTENT	Techniques, activities, resources and process notes
1-2	Mixtures	Mixtures of materials Briefly explain concepts: • Mixtures • Solutions • Solid • Soluble • Insoluble • Pure Substance Distinguish between a pure substance and a mixture Briefly explain the properties of a mixture Identify any four methods of separating mixtures into pure substance	**Guideline:** • Make use of practical demonstrations to explain the following concepts for example: **Step 1:** • Mixture: Mixtures are everywhere you look, most things in nature are mixtures (rocks, ocean, atmosphere, orange juice etc.). A mixture is something that could be separated into two or more substances. • Solution: A solution is when two or more substances dissolves in each other. The substance that dissolves is called the solute. The substance that does not dissolve is called a Solvent. For example, Salt water = water (solvent) + salt (solute). • Soluble: Means the substance is capable of dissolving in a solvent. For example: Sugar is a soluble because it is capable to dissolve in water. • Insoluble: Means the substance is incapable to dissolve in a solvent. For example: Sugar is not soluble in oil. • Pure Substance: A pure substance is made up of only one kind of molecules. It is a substance that cannot be separated by physical means. For example, filtration, evaporation, distillation or chromatography. Examples of pure substances: iron, wood, copper, water, gold, oxygen.

			Step 2:
			
			Practical demonstration:
			
			• Distinguish between a substance and a mixture:
			  o A pure substance has only one kind of molecules. Sugar is a pure substance.
			  o A mixture has a number of pure substances mixed together sugar and cinnamon is a mixture of two materials.
			
			Step 3:
			
			• Properties of a mixture
			  o The components of a mixture can easily be separated.
			  o Each component keeps its original properties.
			  o The proportion of the components is variable.
			
			Step 4:
			
			• Identify four methods to separate mixtures in a pure substance:
			
			These examples are only guideline:
			
			  o **A magnet**: (used to separate a metal from non-metal) For example it could be used to separate sand from iron.

			○ **Filtration**: (used to separate a solid from a liquid) The liquid passes through the holes of the filter paper. The solid particles are to big and got stuck. For example: Filtration could be used to separate dirt from some water. ○ **Evaporation**: (used to separate a dissolved solute from a solution) When salty water is warmed the water evaporates leaving behind crystals of salt. ○ **Distillation**: The process of purifying a liquid by boiling a liquid and condensing its vapours. For Example, Salt water is turned into fresh water through distillation. Various forms of fuel, such as gasoline, are separated from crude oil by distillation. Alcoholic beverages are made through distillation. The alcohol is boiled off from the rest of the mixture and collected in a concentrated format. ○ **Sieving**: A sieve is a tool with many holes and that is used to separate smaller particles from larger ones or liquids from solids. A coffee filter could be used to separate the coffee grounds from the water. ○ **Hand sorting**: Physical differences between the materials are easily identified and materials could be sorted by hand. For example: Sorting smarties from jelly tots.

3-4	Solutions as special mixture	Name the ingredients of a mixture. Explain the difference between a mixture and a solution.	**Step 1:** • The ingredients are solids and/or liquids that are combined by a process to make a new product. **Examples:** o Air = oxygen + nitrogen + other gases o Cement = sand + water + gravel o Dirty snow = water + dirt o Ocean water = salt + water **Step 2:** A solution is a type of mixture. o A Solution is when two or more substances dissolves in each other. For example: Salt water. o A mixture that is not the same throughout is not a uniform mixture. For example: Sand water. **Enrichment:** Learners could sort different combinations of substances as a mixture or a solution.

5-6	Dissolving	Explain the concept dissolving with examples: • List what you know about familiar situations when dissolving • Investigate the factors of dissolving **Practical: Demonstrate** • Rate of dissolving	**Guideline:** **Step 1:** • Explain the concept dissolving with examples: o A solution is made of a substance called solute (for example: sugar) that dissolves in another substance called the solvent (for example: water). o Solution→Solute dissolves in Solvent o Dissolving is the process when the solute dissolves in a solvent. **Step 2:** • Rate of dissolving: The rate of dissolving is the measure of how fast the solute dissolves in a solvent. • Investigate the factors of dissolving: o Temperature: As the particles in the solvent and solute speed up the process of dissolving. They mix together faster. o Agitation: Stirring or shaking the solution also speeds up the process of dissolving. o Surface-area: The amount of surface of an object. o Grain size of the solute

			Step 4: • **Practical demonstration:** Use different examples to investigate the rate of dissolving. For example: Making a cup of coffee: o How does hot or cold water influence the rate of dissolving? o How will stirring or shaking the coffee and sugar influence the rate of dissolving opposite to not stirring or shaking? etc.

7-8	Water cycle	The Water Cycle Briefly define concepts: • Water cycle • Evaporation • Condensation • Precipitation Describe states of water on earth Describe how matter change from one phase to another Describe the stages and features of the water cycle **Practical:** Draw the water cycle and describe it in your own words	**Guideline:** This is only a guideline for the teacher when explaining concepts: **Step 1**: Make use of a poster/visual media to explain concepts: ○ **Water cycle**: Continues movement of water in a cycle above, below and on the surface of the Earth. The Earth has a limited amount of water. As the water keeps going around and around throughevaporation, condensation and precipitation. It is the way water moves between being water vapour (gas) to water (liquid) and back to vapour (gas). ○ **Evaporation**: When the sun heats up water in rivers, lakes and oceans it turns water (liquid) into vapour or steam. ○ **Condensation**: Water vapour in the air gets cold and changes into a liquid forming clouds. ○ **Precipitation**: Occurs when so much water has condensed that the air cannot hold it anymore. The clouds get heavy and water falls back to the Earth in the form of rain, hail, sleet or snow

			Step 2: • Describe the states of water on Earth: o Solid: Ice/Snow/Hail/Sleet o Liquid: Rain/Rivers/Oceans/Lakes/Underground water etc. o Gas: Steam/ Water Vapour **Step 3:** • Describe how matter change from one phase to another: All matter can change from one state to another under extreme pressure and/or extreme temperature. **Points of change**: Freezing point, Meltingpoint, o Pressure and Boiling point. o Melting: Solid → Liquid o Freezing: Liquid→ Solid o Boiling: Liquid → Gas o Condensation: Gas → Liquid

			Step 4: • Describe the stages and features of the Water Cycle with the use of visual media: There are four (4) stages in the Water Cycle: ○ **Evaporation**: When the warmth from the sun causes water from oceans, lakes, streams, ice and soils to rise into the air and turn into water vapour (gas). ○ **Condensation**: This is when water vapour in the air cools down and turns into liquid water. ○ **Precipitation**: This is when water falls from the clouds in the sky. ○ **Collection**: This is when water falls from the clouds as rain, hail, snow or sleet and collects in the oceans, lakes and streams. Most will infiltrate into the ground and will collect as underground water. **Step 5:** • **Practical activity:** Describe and draw the Water Cycle in your own words.
9 -10	The weeks allocated for formal assessment are integrated across the term.		
Formal Assessment: • Practical: 40 % • Test (Pen and Paper): 60 %			

Year 3 Term 3

WEEK	TOPIC	CONTENT	Techniques, activities, resources and process notes
1-2	Energy and temperature	Measuring Temperature Explain concepts with examples • Heat • Temperature • Celsius scale • Boiling point • Conductor • Insulator • Melting point • Measuring temperature	**Note to the teacher:** Before introducing these concepts, the teacher could consult other resources visual media would be the best resource for learners to grasp these concepts. **Step 1:** • Heat: Heat energy is released when molecules in substances are moving rapidly in a very disorderly way. • Temperature: Is the degree of intensity of hotness or coldness. • Celsius scale: A temperature scale that defines the freezing point of water as 0 degrees and the boiling point of water as 100 degrees. • Boiling point: The temperature at which a liquid begins to boil. • Conductor: A material that allows electricity or heat energy to move through it. • Insulator: A material that allows little or no heat or sound to go into or out of something. • Melting point: The temperature at which something melts. • Measuring temperature: Temperature is measured in degrees Celsius.

		Practical: Demonstrate how to read a thermometer in degrees Celsius Demonstrate how heating and cooling can change materials	**Step 2:** • Demonstrate how to read a thermometer in degrees Celsius Show learners in class practically demonstrating how to read a thermometer. For example: Make use of ice cubes in a beaker put the thermometer in a beaker for a view seconds so that learners could observe (read) the measurement in degrees celsius on the thermometer. Put the beaker with ice on a burner with the thermometer inside. Now learners could observe (read) the measurement in degrees celsius. OR Teacher could make use of other visual media such as You Tube, posters etc. • Demonstrate how heating or cooling could change material: Use practical examples in everyday life these are just a suggestion: o Show learners images of power lines in the winter (the cable looks like it is in a straight line) to images of the power line in summer (it looks like the cable is hanging). This allows the learners with guidance from the teacher to make a conclusion that heating or cooling allows a material to expand or shrink. o Show learners that when you use a candle heat allows a piece of paper or plastic to change its shape. When cooled the paper or plastic has changed from the original form.

3-4	Stored energy in fuels	Fuels Explain concepts with definitions and examples: • Fuels • Gas • Candle wax • Fossil fuels • Petrol • Paraffin • Electricity • Safety rules	**Note to the teacher:** If possible, try to take examples of these resources to school to physically show them what it is. (Safety: do not allow learners to come into contact with these resources without informing them of the dangers or safety rules when handling them or without proper supervision.) **Step 1:** These are basic definitions of the concepts. You may use other resources to explain these concepts in detail. • Fuels: A substance that can be consumed to produce energy. • Gas: A fossil fuel in its gaseous state. • Candle wax: A solid block of wax with an embedded wick that is burned to provide light. • Fossil fuels: Fossil fuels are buried plant and animal matter that have developed within the Earth over millions of years. • Petrol: A kind of oil that comes from below the ground and that is a source of gasoline and other products. • Electricity: Electricity is the flow of electrical power or charge. Safety rules: Rules/guidelines to prevent accidents and injuries

5-6	Burning fuels and Safety with fire	Burning fuels Investigate, compare and describe various fuels • Input energy needed to make them burn • Output energy released such as heat and light Investigate compare and describe how to keep different fuels burning e.g. candle Safety with fire Discuss safety measurements and safety rules when using various fuels **Practical activity:** Learner should identify (for example 5) safety rules and make a poster to illustrate them.	These are basic definitions of the concepts. You may use other resources to explain these concepts in detail. **Step 1:** • Input energy: Energy put into a system to achieve a result (output). • Output energy: The energy produced by a system. Input energy needed to make them burn: For example: Input energy needed to provide candle light: oxygen + heat energy(fire) + candle wax. Input energy needed to start a car: Petrol or Diesel. Input energy needed to warm water with a solar system: Heat energy (sunlight). **Note to the teacher:** Make use of other practical examples to explain the concept of input energy needed! Output energy released such as heat and light: For example: Output energy from burning a candle: light energy and heat energy. Output energy from starting a car: Movement energy and Sound energy. Output energy form using a solar system the heat water: Heat energy.

			Note to the teacher: Make use of other examples to explain the concept of output energy released! **Step 2:** Discuss safety measurements and safety rules when using various fuels: **Note to the teacher:** Make use of appropriate safety measurements and rules applicable to the learners' environment. Use visual resources for example poster/You Tube. **Practical activity:** Learner should identify (for example 5) safety rules and make a poster to illustrate them.

7-8	Energy and electricity	Cells and battery Briefly define concepts with definitions and examples: • Battery(cells) • Electric circuit • Electrical components • Stored energy • Sources of energy List and explain the different types of batteries and their uses	These are basic definitions of the concepts. You may use other resources to explain these concepts in detail. **Step 1:** • **Battery(cells):** A battery is a device that stores electrochemical or electrostatic energy. Batteries come in many shapes and sizes. Some are small as a button. Batteries are used every day by people for many different portable devices, automobiles, boats etc. • **Electrical components**: Cell/battery, bulb/globe, insulated wires, switch etc. • **Stored energy**: Sources that has the potential to provide energy. • **Sources of energy**: There are many different types of energy sources renewable-(wind, water, sunlight, biomass) and non-renewable (fossil fuels, Nuclear) energy. **Step 2:** List and explain the different types of batteries and their uses: **Note to the teacher:** These are basic examples. You may use other examples. There are two (2) types of batteries: ▪ Disposable/Non-rechargeable batteries called Primary batteries for example: Flash light, TV remote control, Clock etc. ▪ Re-useable/Rechargeable batteries called Secondary batteries for example: Cell phones, digital camera, cordlesspower tool etc.

9 -10	The weeks allocated for formal assessment are integrated across the term.

Formal Assessment:

- Practical: 50 %
- Test (Pen and Paper): 50 %

Year 3 Term 4

WEEK	TOPIC	CONTENT	Techniques, activities, resources and process notes
1-5	Movements of the Earth and planets	Explain concepts and definitions: • Solar systems • Star • Earth axis • Rotation • Revolution • Satellite • Reflection of sunlight from the moon • gravity Explain and demonstrate how the earth moves in relation to the sun around us Day and Night • Describe the rotation of the earth on its own axis to explain day and night	These are basic definitions of the concepts. You may use other resources to explain these concepts in detail. Make use of visual resources for examples pictures, posters or You Tube. **Step 1:** • Solar systems: It is all the planets, the moons, comets, asteroids, dust and gas that orbits around the sun. (Everything in the Solar system orbits around the sun) • Star: Stars are burning gas. Stars are formed in clouds of gas and dust known as the Nebulae. Nuclear reactions at the centre of the star create enough energy to make them shine for at least hundred thousand years. • Earth axis: An axis is an invisible line around which an object rotates or spins. The Earth's axis has a tilt of 23,5˚. The tilt causes the seasons. • Rotation: Movement around a central point. The Earth spins around its own internal axis which is tilted 23,5˚. One rotation takes 1 day (24hours). • Revolution: When a planet or moon travels around an object it is called a revolution. The Earth revolves around the sun in 365 ¼ days from West to East. • Satellite: A satellite is a moon, planet or machine that orbits a planet or star. • Reflection of sunlight from the moon: Moonlight is the light that reaches Earth from the moon. The light of the moon is actually a reflection of the light from the sun.

		Moon Explain and draw the different phases of the moon Describe the basic characteristics of the moon Describe ways the moon phases are connected to traditional, cultural activities and beliefs in the society **Practical Activity:** Draw a picture to illustrate the revolution of the Earth around the sun causing the different seasons on Earth. OR: Build a model to illustrate it.	• Gravity: (A force of attraction that pulls objects together) Earth's gravity is what keeps objects on the ground and causes objects to fall. Gravity is what holds the planets in orbit around the sun and what keeps the moon in orbit around the Earth. The larger an object is the more gravity it has. Because the sun is so large, its powerful gravity attracts all other objects in the solar system towards it.

6-7	Systems looking into space	Rocket systems Explain give definitions of the concepts: • Rocket • Telescope Explain how people travel into space Telescopes Describe how telescopes are used to look into space and gather information Discuss the largest telescope is in South Africa	These are basic definitions of the concepts. You may use other resources to explain these concepts in detail. Make use of visual resources for examples pictures, posters or You Tube. **Step 1:** • Rocket: Long circular device that is launched into the air. It could also mean a type of engine. • Telescope: A magnifier of distant objects or images. **Step 2:** Explain how people travel in space. • Space travel is a dangerous and very expensive. A space shuttle or spacecraft is used to travel in space. In order for a space shuttle to break free of Earth's gravity it has to travel at a speed of about 24 000km/h. A space shuttle will need 1,9 million liters of fuel to launch into space. The combination of high speed, heat and fuel needed for launching can lead to a potentially dangerous situation. Astronauts travel to space. (Excellent video's available on You Tube from NASA) **Step 3:** Describe how telescopes are used to look into space and gather information. • There are several types of telescopes that are used to study the universe. The Hubble Space Telescope is currently the largest space telescope. The main purpose of a telescope is to make objects from outer space as bright and large as possible. It allows researchers to expand our knowledge of the universe.

			Step 4: Discuss the largest telescope is in South Africa. The largest telescope in South Africa is the Southern African Large Telescope (SALT) located close to the town Sutherland in the Karoo. Construction was completed at the end of 2005. Since September 2011 the telescope is releasing its potential as Africa's Giant Eye on the universe.
8 -10	The weeks allocated for formal assessment are integrated across the term.		
Formal Assessment: • Practical: 40 % • Test (Pen and Paper): 60 %			

Year 4 Term 1

WEEK	TOPIC	CONTENT	Techniques, activities, resources and process notes
1-2	Sense Organs	**Senses** Briefly define concepts through demonstration: • Senses • Sight(vision) • Smell • Hearing • Sense of touch • Taste Name and describe animal senses adapted for survival: • Use hearing for protection etc. • Use smell to find food	**Note to the teacher:** These are basic definitions of the concepts. You may use other resources to explain these concepts in detail. • Senses: There are 5 senses the body has to react on external stimuli. • Sight(vision): Using your eyes to see. • Smell: Detection is scents or odours using your nose. • Hearing: Detection of sound using your ears. • Sense of touch: Bodily contact with an object. • Taste: The sensation of flavour on one's tongue when in contact with a substance. **Step 1:** The teacher sets up different work stations for learners. They experience stimuli through their different senses: • Sight (Kaleidoscope) • Hearing (Tapes, singing, clapping etc.) • Tasting (white substances sugar, salt, maize, flour) • Feeling (different objects in a bag) • Smell (different fruits) • Sensitivity (put one hand in hot water, and then places both in cold water)

			Learners explain and/or write their experience. **Step 2:** • Learners describe through their experiences or prior knowledge how they think an animal's senses help it to survive in its environment. • Teachers uses pictures of animals (in their environment) to discuss how they use their smell senses to find food.

3-5	Human skeleton	**<u>Human skeleton</u>** Briefly define the basic concepts: • Muscles • The skull • The backbone • The ribs • Limps • Shoulder • Hip girdles • Joints • Pelvis Demonstrate and explain the number of bones that make up an adult human skeleton Describe the function of the bones of the human skeleton Explain how individual bones in the skeleton are held together	**Note to the teacher:** These are basic definitions of the concepts. You may use other resources (pictures/You Tube /model) to explain these concepts in detail: • Muscles: Elastic tissue that pull our bones when we move. • The skull: Bone that protects the brain and sense organs. • The backbone: The series of vertebrae extending from the skull to the pelvis. • Ribs: Curved bones of the chest that are joined to the backbone. • Limbs: Arm or leg of a person or animal. • Shoulder: The upper joint of a person's arms and the part of the body between this and the neck. • Hip girdles: Bone structure supporting the lower limbs. • Joints: Where two bones meet. • Pelvis: The large bone frame where the legs are attached. **Step 1:** Demonstrate through visual media the number and function of bones in the human skeleton: • Skull: • Backbone: • Ribs • Limbs:

		Discuss the importance of eating healthy foods to develop healthy and strong bones. Discuss therapy and care for broken bones **Practical: Draw a poster to illustrate and identify the physical changes in human development**	• Shoulder: • Hips: • Pelvis: **Step 2:** Demonstrate and explain how the different bones are held together in the skeleton: Make use of a model, pictures, You Tube or any other resource. **Step 3:** Discuss the importance of eating healthy foods to develop healthy and strong bones: Make use of visual resources. **Step 4:** Discuss therapy and care for broken bones: Learners who had broken bones could give feedback on their own experiences. The teacher could explain when a bone is broken and the importance of therapy.

6-8	Human Reproductive Reproduction	**<u>Human Reproductive System</u>** **Reproduction** Introduce and explain concepts with examples • Sex hormones • Egg development • Sperm development • Menstrual cycle • Ovulation • Reproduction • Egg cells • Sperm cells • Reproductive system (males and females) Explain and describe the prenatal development of a fetus during the three (3) trimesters in the uterus:	**Note to the teacher:** These are basic definitions of the concepts. You may consult other resources (pictures/You Tube) to explain these concepts in detail: • Sex hormones • Egg development • Sperm development • Menstrual cycle • Ovulation • Reproduction • Egg cells • Sperm cells • Reproduction system (males and females) **Step 1:** **Note to the teacher:** There are excellent resources available in books, hospitals, slideshows with real-life pictures, clinics and You Tube etc. A qualified nurse could also come to inform learners about the development of a fetus inside the uterus.

		Explain the physical changes: • Explain the features in the human organisms development	Explain and describe the prenatal development of a fetus during the three (3) trimesters in the uterus **Step 2:** Explain the physical changes: • Explain the features in the human organisms development: Infant → toddler → Adolescence (teenager) → Adult → Senior citizen.
9 -10	The weeks allocated for formal assessment are integrated across the term.		
Formal Assessment: • Practical: 50 % • Test (Pen and Paper): 50 %			

Year 4 Term 2

WEEK	TOPIC	CONTENT	Techniques, activities, resources and process notes
1-3	Acids and bases	**Acids and bases** Briefly define concepts: • Acids • Bases • Indicators • Universal indicator • Neutral • Neutralise Group different acids and bases from household substances • Describe difference between acids and bases • Explain safe handling methods and disposal of household chemicals	**Note to the teacher:** These are basic definitions of the concepts. You may consult other resources (pictures/You Tube) to explain these concepts in detail: • Acids: A sour corrosive substance. • Bases: A bitter soapy substance. • Indicators: A chemical compound that changes color and structure when exposed to certain conditions it is useful for chemical tests. • Universal indicator: A solution which undergoes several color changes over a wide range of pH's. The color is used to "indicate" pH directly. Universal indicators are usually mixtures of several indicators. • Neutral: Substance with a pH-value of 7. • Neutralise: To cause an acidic solution to become neutral by adding a base to it or to cause a basic solution to become neutral by adding an acid to it **Step 1:** Explain and discuss the differences between acids and bases from household substances through one or two examples of each identified by the teacher. Examples of possible household substances: (tap water, soaps, shampoos, window-, toilet- and drain cleaners, washing powder, Handy Andy, vinegar, lemon, Brussel sprouts, broccoli, tomato, milk of magnesia etc., cosmetics, anti-acids tablets)

		Practical activity • Test various household substances with blue and red litmus paper and sort them into acids bases and neutrals	**Step 2:** Test various household substances with blue andred litmus paper and sort them into acids bases andneutrals. **Practical activity:** Learners could work in groups.

4-6	Process to purify water	**<u>Process to purify water</u>** **Clean Water** Introduce and explain concepts with examples: • Natural processes • Pollution • Filtering • Purify • Germs and bacteria Explain the importance of drinking clean water	**Note to the teacher:** These are basic definitions of the concepts. You may consult other resources (pictures/You Tube) to explain these concepts in detail: • Natural processes: Natural processes in nature without human interference. • Pollution: Contamination natural resources. • Filtering: Using a device with holes to remove something unwanted from a liquid or gas. • Purify: To remove impurities. • Germs and bacteria: Tiny microscopic creatures that can make you sick. **Step 1:** Explain the importance of drinking clean water: • Suggestion: Make use of a class of clean and dirty water. Teacher ask questions: Why is it important to drink water? (prior knowledge) How much glasses of water must a person drink each day? Which one of these two glasses will the learner drink? Give a reason for their answer.

		Demonstrate the different methods of cleaning water e.g. Processes as filtering, boiling, sieving etc. **Practical Investigation** Design, draw or make your own water filter	**Step 2:** Demonstrate the different methods of cleaning water: Filtering: For example, cleaning sand water. (Resources: Filter, filterpaper, a glass of sandwater, clean glass) Boiling: For example, tap water. (Resources: Tap water, kettle or any other heat resource.) Sieving: For example, cleaning water containing leaves etc. (Resources: water with leaves, a sieve, bowl).

7-8	Impact of weather on matter and materials	**<u>Impact of weather, temperature and wind on materials.</u>** Impact of weather on materials • Metals • Non – metals Discuss methods to protect materials against the weather	The teacher should explain difficult concepts that learners might experience. Make use of visual resources. **Note to the teacher:** Have a class discussion on the impact the weather, temperature and wind have on materials like wooden and iron objects on the school grounds. Show learners visual media for example pictures of metals and non-metals that have been exposed to these factors. (Findings of learners could be the iron formed rust and the wood got brittle.) **Step 1:** Impact of weather on metals and non-metals: • Use physical examples of metals and non-metals so that learners could visually see the impact weather had on these examples. **Step 2:** Discuss methods to protect materials against the weather: • Suggestion: Teacher could give learners a variety of products that protect materials against weather. For example, paint, varnish, galvanised etc. Learners should identify which of these products would be used best to protect certain materials
9 -10	The weeks allocated for formal assessment are integrated across the term.		

Formal Assessment:

- Practical: 40 %
- Test (Pen and Paper): 60 %

Year 4Term 3

WEEK	TOPIC	CONTENT	Techniques, activities, resources and process notes
1-2	Electric circuits	**Electric circuits** Define concepts • Static electricity • Electric circuit • Current electricity • Electric components • Conductor • Insulator Explain when a circuit is complete. Demonstrate examples of conductors and insulators	**Note to the teacher:** These are basic definitions of the concepts. You may consult other resources (pictures/You Tube) to explain these concepts in detail: • Static electricity: Electricity created by friction. • Electric circuit: Pathway that allows an electrical current to pass through. • Current electricity: Electricity that moves from one place to another is called current electricity. • Electric components: (Wire, Switch, Cells, Globe/Bulb, Ammeter, Voltmeter) Components able to conduct electricity. • Conductor: Allows an electrical current to pass through. • Insulator: Not able to conduct an electrical current. **Step 1:** Explain when a circuit is complete: • A circuit is complete when the flow of charge is able to move from the positive to the negative of a power source. .

3-4	Systems to solve problems	**Systems to solve problems** Briefly define the following concepts and compare the strength of the current of their cells: • Series • Parallel **Practical activity:** Make simple electrical systems: Draw, label or build an electric circuit that include all components Explain and draw a diagram how electric circuits in our homes are wired from the power supplied from Eskom	**Step 2:** Teacher make use of practical examples of conductors and insulators: Make use of examples from various workshops to illustrate conductors and insulators **Note to the teacher:** These are basic definitions of the concepts. You may consult other resources (pictures/You Tube) to explain these concepts in detail: • Series: There is only one path the current can flow. • Parallel: The are more than one path the current can take **Step 1:** Practical demonstration by the teacher: Build a circuit in series and parallel so that learner could observe the difference in strength of the current. **Step 2:** Draw, label or build an electric circuit that include all components (wire, switch, cells, globes) **Step 3:** Teacher explain or describe how electricity are transported from the power station to each household:

5-6	Mains electricity	**Mains electricity** Describe concepts with examples: • Electric supply • Generator • Turbine Discuss with examples the different energy sources that are used to produce electricity	**Note to the teacher:** These are basic definitions of the concepts. You may consult other resources (pictures/You Tube) to explain these concepts in detail: • Electric supply: How much electricity is available for use and how was the electricity generated? What resource was used to generate electricity? • Generator: System used to create electricity. • Turbine: An engine that has a part with blades that are caused to spin by pressure from water, steam, or air. **Step 1:** Discuss with examples the different energy sources that are used to produce electricity: • Hydro-electric power: When water is used to supply electricity. Usually near waterfalls or dams. In South Africa the Gariep dam supplies hydro-electric power to its surroundings. • Solar power: Use of the sunlight to generate electricity. The sun's energy is absorbed by solar panels. These solar panels contain photovoltaic cells (batteries) which convert energy from the sun to electrical energy. • Wind power: When the kinetic energy from the wind are used to generate electricity. Wind power generators are built on wind farms. The first windfarm in South Africa was built near a small-town Darling in the Western Cape. • Nuclear power: When Uranium ore is mined and converted to a fuel used at nuclear power plants. Uranium or is not a fossil fuel but also a non-renewable fuel. Nuclear power is made in special power station called nuclear power stations. In South Africa

			there is currently one nuclear power station near Cape Town at Koeberg. Nuclear power has very dangerous radioactive waste material. Radioactive waste can harm living things and even cause death. The waste must be buried deep below the earth in special containers for hundreds of years to become less dangerous. • Coal power (Fossil Fuel): Fuels formed by buried plant and animal matter that lived millions of years ago. When it is used up it cannot be replaced because it takes so long to from. Using fossil fuels also causes air pollution to the environment.

7-8	Saving cost of generating electricity	**Saving Cost of Generating Electricity** Briefly explain concepts: • Saving • Appliance • Solar energy • Load shedding Investigate alternative energy sources and how to use it instead of using electricity. Recall better practices in using energy to save cost.	**Note to the teacher:** These are basic definitions of the concepts. You may consult other resources (pictures/You Tube) to explain these concepts in detail: • Saving: Using less of a resource • Appliance: Device designed to perform a specific task. • Solar energy: Energy from the sun. • Load shedding: Action used to reduce the load on something. Interruption of the electricity supply to avoid excessive load on the generating plant. **Step 1:** Investigate alternative energy sources and how to use it instead of using electricity: • Suggested examples for the teacher: (Fire to make food, candle/paraffin lamp to make light, wind/sun to dry washing, solar geyser to warm water, battery power appliances etc.) **Step 2:** Recall better practices in using energy to save cost: • Suggested examples for the teacher: (Switch of unnecessary lights/electrical appliances/ Lower the thermostat during the summer/use only enough water in the kettle)

9 -10	The weeks allocated for formal assessment are integrated across the term.

Formal Assessment:

- Practical: 50 %
- Test (Pen and Paper): 50 %

Year 4 Term 4

Week	Topic	Content Revision and Consolidation
1-4	• **Life and living** • **Matter and material** • **Energy and change**	• **Sense Organs** • **Human skeleton** • **Human Reproductive System** • **Acids and bases** • **Process to purify water** • **Impact of weather on matter and materials.** • **Electric circuits** • **Systems to solve problems** • **Mains electricity** • **Saving Cost of Generating Electricity**
5-10	**External examination**	External moderation of school assessment over terms 1, 2 and 3 = 75% of qualification Formal external assessment written test or oral = 25% of qualification

SECTION 4

ASSESSMENT

4.1 Introduction

This section on assessment *standardises* the recording and reporting processes for the Technical Occupational Curriculum and Assessment Policy Statement that is offered in schools that offer this learning programme. It also provides a policy framework for the management of school-based assessment and school assessment records.

It is critically required of teachers to offer all measures of differentiated assessment as outlined in Chapter 9 of the National Protocol for Assessment. Especially learners in special schools who follow the Technical Occupational Curriculum over a period of four years have diverse learning styles and support needs. Since a learner or learners may be functioning on different levels, the assessment / recording / reporting system must make provision to reflect the level(s) of each leaner. Each learner, regardless of his/her number of years in the school, must have access to the standard of assessment best suited to his/her needs. The learner's *abilities* determine what will be expected of him/her and the *pacing* of instruction must accommodate each individual learner within a framework of high expectations (See Chapter 9 of the National Protocol for Assessment).

Learners are also eligible for Accommodations and Concessions as outlined in the Standard Operating Procedures for the Assessment of Learners who Experience Barriers to Assessment from Grade R to 12 (2017).

All decisions related to differentiated assessment are made through completing the protocols as outlined in the Policy on Screening, Identification, Assessment and Support (2014) and recorded and tracked through the Individual Support Plans of learners.

4.2 Assessment Principles

4.2.1 Definition

Assessment is a continuous planned process of identifying, gathering and interpreting information about the performance of learners, using various forms of assessment. It involves four steps: generating and collecting evidence of achievement; evaluating this evidence; recording the findings and using this information to understand and thereby assist the learner's development in order to improve the process of learning and teaching. Assessment should be both informal (Assessment for Learning) and formal (Assessment of Learning). In both cases regular feedback should be provided to learners to enhance the learning experience.

Assessment is a process that measures individual learners' attainment of knowledge (content and concepts) and skills by collecting, analysing and interpreting the data and information obtained from this process to:

- Enable the teacher to judge a learner's progress in a reliable way;
- Inform learners of their strengths, weaknesses and progress; and
- Assist teachers, parents and other stakeholders in making decisions about the learning process and the progress of learners.

Assessment should be mapped against the content, skills, intended aims and topics specified in the learning programme. In both informal and formal assessments, it is important to ensure that in the course of a school year:

- All of the topics and content are covered;
- The full range of skills is included; and
- A variety of different forms of assessment are used.

4.2.2 Informal Assessment or Daily Assessment

Assessment for learning has the purpose of continuously collecting information on a learner's achievement that can be used to improve their learning. Informal assessment is a daily monitoring of learners' progress. This is done through observations, discussions, practical demonstrations, learner-teacher conferences, informal classroom interactions, etc. Informal assessment may be as simple as stopping during the lesson to observe learners or to discuss with learners how learning is progressing. Informal assessment should be used to provide feedback to the learners and to inform planning for teaching but need not be recorded. It should not be seen as separate from learning activities taking place in the classroom. Learners or teachers can assess their performance in the tasks. Self-assessment and peer assessment actively involves learners in assessment. This is important as it allows learners to learn from and reflect on their own performance. The results of the informal daily assessment tasks are not formally recorded unless the teacher wishes to do so. **The results of daily, informal assessment tasks are not taken into account for progression, promotion and certification purposes.**

Informal, on-going assessments should be used to scaffold the acquisition of knowledge and skills and should be the stepping stones leading up to the formal tasks in the Programmes of Assessment.

4.2.3 Formal Assessment

All assessment tasks that make up a formal programme of assessment for the year are regarded as Formal Assessment. Formal Assessment Tasks are marked and formally recorded by the

teacher for progression and certification purposes. All Formal Assessment Tasks are subject to moderation for the purpose of quality assurance and to ensure that appropriate standards are maintained. Formal assessment tasks form part of a year-long formal Programme of Assessment.

a. Why use a Formal Assessment task?

"Formal Assessment Task (assessment of learning)" – is a systematic way of assessment used by teachers to determine how well learners are progressing in a level and in a particular subject.

b. What is a Formal Assessment Task?

It is a set of questions and or instructions that learners need to respond to. A task may consist of a range of activities. A formal task must be valid, fair and reliable and must cover sufficient knowledge and or skills to report on the learners' progress.

Teachers must ensure that assessment criteria are very clear to the learners before the assessment process commences. This involves explaining to the learners which knowledge and skills are being assessed and the required length of responses. Feedback should be provided to the learners after assessment and could take the form of whole-class discussion or teacher-learner interaction. Examples of formal assessments include projects, oral presentations, simulations, performances, tests, examinations, practical demonstrations, etc. The **forms of assessment** used should be appropriate to the age and the developmental level of the learners as well as the context of the subject or skills being assessed. The assessment tasks should be carefully designed to cover the topic, content and or skills of the subject. The design of these tasks should therefore ensure that a variety of skills are assessed.

Practical Assessment Tasks allow for learners to be assessed on a regular basis during the school year and also allow for the assessment of skills that cannot be assessed in a written format, e.g. test or examination.

Assessment in the General Certificate of Education: Technical Occupational (GCE: TO)

Assessment in the GCE: TO is underpinned by the objectives of the National Qualifications Framework (NQF). These objectives are to:

- Create an integrated national framework for learning achievements.
- Facilitate access to and progression within education, training and career paths.
- Enhance the quality of education and training.

- Redress unfair discrimination and past imbalances and thereby accelerate employment opportunities.
- Contribute to the holistic development of the learner by addressing:
  - Social adjustment and responsibility;
  - Moral accountability and ethical work orientation;
  - Economic participation; and
  - Nation-building.

The principles that drive these objectives are:

- ***Integration***

  To adopt a unified approach to education and training that will strengthen the human resources development capacity of the nation.

- ***Relevance***

  To be dynamic and responsive to national development needs.

- ***Credibility***

  To demonstrate national and international values and acquired competencies and skills so as to ensure the recognition of the qualification to be attained.

- ***Coherence***

  To work within a consistent framework of principles and certification.

- ***Flexibility***

  To allow for creativity and resourcefulness when achieving skills to cater for different learning styles and use a range of assessment methods, instruments and techniques.

- ***Participation***

  To enable stakeholders to participate in setting standards and co-ordinating the achievement of the qualification.

- ***Access***

  To address barriers to learning at each level to facilitate learners' progress.

- ***Progression***

  To ensure that the qualification framework permits individuals to move through the levels of the national qualification via different, appropriate combinations of the components of the delivery system.

- ***Portability***

  To enable learners to transfer parts of a qualification from one learning institution and/or employer to another institution or employer.

- ***Articulation***

  To allow for vertical and horizontal mobility in the education system when pre-requisites for accreditation have been successfully completed.

- ***Recognition of Prior Learning***

  To grant credits for a unit of learning following an assessment or if a learner possesses the capabilities specified in each skills area.

- ***Validity of assessments***

  To ensure assessment covers a broad range of knowledge, skills, values and attitudes (SKVAs) needed to demonstrate applied competency. This is achieved through:

  - Clearly stating the skill to be assessed;
  - Selecting the appropriate or suitable evidence;
  - Matching the evidence with a compatible or appropriate method of assessment; and
  - Selecting and constructing an instrument(s) of assessment.

- ***Reliability***

  To assure assessment practices are consistent so that the same result or judgment is arrived at if the assessment is replicated in the same context. This demands consistency in the interpretation of evidence; therefore, careful monitoring of assessment is vital.

- ***Fairness and transparency***

  To verify that no assessment process or method(s) hinders or unfairly advantages any learner. The following could constitute unfairness in assessment:

  - Inequality of opportunities, resources or teaching and learning approaches;
  - Bias based on ethnicity, race, gender, age, disability or social class;
  - Lack of clarity regarding topic, content or skill being assessed; and
  - Comparison of learner's work with that of other learners, based on learning styles and language.

- ***Practicability and cost-effectiveness***

  To integrate assessment practices within the teaching and learning process and strive for cost and time-effective assessment.

4.3 Managing Assessment

Assessor Requirements

Assessors must be subject specialists with adequate formal assessment experience. If the teacher conducting the assessments has not been declared a competent assessor, an assessor who has been declared competent may be appointed to oversee the assessment process to ensure the quality and integrity of assessments for the qualification.

Types of Assessment

Assessment benefits the learner and the teacher. It informs learners about their progress and helps teachers make informed decisions at different stages of the learning process. Depending on the intended purpose, different types of assessment can be used.

- **Baseline assessment:** At the beginning of a level or learning experience, baseline assessment establishes the knowledge, skills, values and attitudes (SKVAs) that learners bring to the classroom. This knowledge assists teachers to plan learning programmes and learning activities.

- **Diagnostic assessment:** This assessment diagnoses the nature and causes of barriers to learning experienced by specific learners. It is followed by guidance, appropriate support and intervention strategies. This type of assessment is useful to make referrals for learners requiring specialist help.

- **Formative assessment (Informal Assessment):** This assessment monitors and supports teaching and learning. It determines learners' strengths and weaknesses and provides feedback on progress. It determines if a learner is ready for summative assessment.

- **Summative assessment (Formal Assessment)** This type of assessment gives an overall picture of student progress at a given time. It determines whether the student is sufficiently competent to progress to the next level.

Planning Assessment

An assessment plan should cover three main processes:

- **Collecting evidence:** The assessment plan indicates which learning programme topics, content and skills will be assessed, what assessment method or activity will be used and when this assessment will be conducted.

- **Recording:** The process of recording refers to the assessment instruments or tools with which the assessment will be captured or recorded. Therefore, appropriate assessment instruments must be developed or adapted.

- **Reporting:** All the evidence is put together in a report to deliver a decision for the subject.

Methods of Assessment

Methods of assessment refer to who carries out the assessment and includes teacher assessment, self-assessment, peer assessment and group assessment.

TEACHER ASSESSMENT	The Teacher assesses learners' performance against given criteria in different contexts, such as individual work, group work, etc.
SELF-ASSESSMENT	Learners assess their own performance against given criteria in different contexts, such as individual work, group work, etc.
PEER ASSESSMENT	Learners assess another student or group of learners' performance against given criteria in different contexts, such as individual work, group work, etc.
GROUP ASSESSMENT	Learners assess the individual performance of other learners within a group or the overall performance of a group of learners against given criteria.

Task lists and **checklists** show the learners what needs to be done. They consist of short statements describing the expected performance in a particular task. The statements on the checklist can be ticked off when the learner has adequately achieved the criterion. Checklists and task lists are useful in peer or group assessment activities.

Rubrics are a hierarchy (graded levels) of criteria with benchmarks that describe the minimum level of acceptable performance or achievement for each criterion. It is a different way of assessment and cannot be compared to tests. Each criterion described in the rubric must be assessed separately. Mainly, two types of rubrics, namely holistic and analytical, are used.

Competence Descriptions

All assessment should award marks to evaluate specific assessment tasks. However, marks should be awarded against rubrics and not simply be a total of ticks for right answers. Rubrics

should explain the competence level descriptors for the skills, knowledge, values and attitudes (SKVAs) a learner must demonstrate to achieve each level of the rating scale. When teachers or assessors prepare an assessment task or question, they must ensure that the task or question addresses an aspect of a topic or skill. The relevant content must be used to create the rubric to assess the task or question. The descriptions must clearly indicate the minimum level of attainment for each category on the rating scale.

Strategies for Collecting Evidence

A number of different assessment instruments may be used to collect and record evidence. Examples of instruments that can be (adapted and) used in the classroom include:

Record sheets: The teacher observes learners working in a group. These observations are recorded in a summary table at the end of each task. The teacher can design a record sheet to observe learners' interactive and problem-solving skills, attitudes towards group work and involvement in a group activity.

Checklists: Checklists should have clear categories to ensure that the objectives are effectively met. The categories should describe how the activities are evaluated and against what criteria they are evaluated. Space for comments is essential.

School Assessment Programme

The **Programme of Assessment** is designed to spread formal assessment tasks in all subjects in a school across a term.

The programme of assessment should be recorded in the Teacher's planning file (Portfolio of Assessment) for each subject.

The following should at least be included in the Teacher's File:

- A contents page;
- The formal schedule of assessment;
- The requirements for each assessment task;
- The tools used for each assessment task;
- Recording instrument(s) for each assessment task; and
- A mark sheet and report for each assessment task.

The learner's Evidence of Performance must at least include:

- A contents page;
- The assessment tasks according to the assessment programme as indicated below;

- The assessment tools or instruments for the task; and
- A record of the marks (and comments) achieved for each task.

Where tasks cannot be contained as evidence in the Portfolio of Evidence (PoE), its exact location must be recorded, and it must be readily available for moderation purposes.

Assessment across the three years

The school and the teachers have overall responsibility for the assessment of learners. Teachers are expected to create a valid, reliable and credible assessment process.

Year 2 and 3

Year 2-3	**Formal School-Based Assessments**			**Final End-of-Year Assessments**
	Term 1	Term 2	Term 3	Term 4
	Practical-50% (25 Marks)	Practical – 40% (20 Marks)	Practical – 50% (25 marks)	Practical – 40% (20 marks0
	Test – 50% (25 Marks)	Test/Exam – 60% (30 Marks)	Test – 50% (25 Marks)	Test/Exam – 60% (30 Marks)
Number of assessments	2	2	2	2
Term Report	100%	100%	100%	25%
End of Year	SBA 75%			25%

Year 4

Year 4	**Formal School-Based Assessments**			**Final End-of-Year Assessments**
	Term 1	Term 2	Term 3	Term 4
	Practical-50% (25 marks)	Practical – 40% (20 marks)	Practical – 50% (25 Marks)	External Exam
	Test – 50% (25 Marks)	Test/Exam – 60% (30 Marks)	Test – 50% (25 Marks)	
Number of assessments	2	2	2	1
Term Report	100%	100%	100%	100%
End of Year	SBA 75%			25%

MARK ALLOCATION

A percentage weighting is prescribed for the tests, practical and examinations for each year. Teachers can use any total marks for tests, practical and examinations but should be converted to the total weighting percentage for the term as well as year. Practical marks can consist of one (1) or more activities. See minimum mark allocation above.

CLARIFICATION ON ASSESSMENT PERIODS

Year 2 and 3:

Term 1 Test assessment to consist of work done in term 1 only

Term 2 Test/Exam assessment to consist of work done in terms 1 and 2

Term 3 Test assessment to consist of work done in term 3 only

Term 4 Exam assessment to consist of work done in terms 3 and 4

Year 4:

Term 1 Test assessment to consist of work done in term 1 only

Term 2 Test/Exam assessment to consist of work done in terms 1 and 2

Term 3 Test assessment to consist of work done in terms 1, 2 and 3

Term 4 Exam assessment to consist of work done in the year

Cognitive levels for the assessment of content in Year 2, 3 and 4

Setting tests and tasks for different cognitive levels	Knowing science and technology	Understanding science and technology	Applying scientific and technological knowledge	Evaluating, analysing, synthesizing, scientific and technological knowledge
Percentages indicating the proportion of low, middle and high order questions in tasks, tests and exams	Low order questions **70%**	Middle order questions **20%**		High order questions **10%**
Useful verbs to use when setting questions	State Name Label Listand others	Explain Describe Compare Plan Rearrange Give an example and others …	Predict Compare Design Use knowledge to demonstrate and others …	Evaluate Suggest a reason Interpret and others ...

Recording and Reporting

Recording is a process in which the teacher documents the level of a learner's performance in a specific assessment task. It indicates learner progress towards the achievement of the knowledge and skill. Records of learner performance should provide evidence of the learner's progression. Records of learner performance should also be used to verify the progress made by teachers and learners in the teaching and learning process. Reporting is a process of communicating learner performance to learners, parents, schools, and other stakeholders. Learner performance can be reported in a number of ways. These include report cards, parents' meetings, school visitation days, parent-teacher conferences, phone calls, letters, class or school newsletters, etc.

Good record keeping is essential in all assessment, particularly in continuous assessment. A record book or file must be kept up to date by each teacher. It should contain:

- Learners' names;
- Dates of assessment;
- Name and description of the assessment activity;
- The results of assessment activities, according to Subject; and
- Comments for support purposes.

Teachers report in percentages against the subject. The various achievement levels and their corresponding percentage bands are as shown in the table below. Recording is a process in which the teacher documents the level of a learner's performance. Teachers record the actual raw marks against the task using a record sheet. Records of learner performance should also be used to verify the progress made by teachers and learners in the teaching and learning process. Records should be used to monitor learning and to plan ahead.

Note: The seven-point scale should have clear descriptions that give detailed information for each level. Teachers will record actual marks against the task by using a record sheet; and report percentages against the subject on the learners' report cards.

Codes and percentages for reporting

Rating code	Description of competence	Percentage	Nature of support provided to learners
7	Outstanding achievement	80 – 100	Independent
6	Meritorious achievement	70 – 79	Independent, verbal cues needed
5	Substantial achievement	60 – 69	Minimum support
4	Adequate achievement	50 – 59	Moderate support
3	Moderate achievement	40 – 49	Maximum support (Physical / Verbal)
2	Elementary achievement	30 – 39	Goals to be revisited – Change of direction required.
1	Not achieved	0 – 29	Little / no interest shown in the activity despite maximum support

All records must be accessible, easy to interpret, securely kept, confidential and helpful in the teaching and reporting process. The school assessment policy determines the details of how record books must be completed. Schools are required to provide quarterly feedback to parents on the Programme of Assessment, using a formal reporting tool, such as a report card. The schedule and the report card should indicate the overall level of performance of a learner.

NOTE:

Criterion referencing is best used to describe learner's performance in a skill. Teachers must make use of suitable analytical rubrics when assessing a learner's competence for a specific skill using practical demonstrations.

Progression and Promotion:

Learners will progress with age cohort in this Phase (Year 1-4). Where a learner does not meet the minimum requirements to be promoted to the next year then a learner may spend one extra year in the phase (Year 1-4) to strengthen their ability to achieve the qualification.

Moderation of Assessment

Moderation refers to the process that ensures that the assessment tasks are fair, valid and reliable. Moderation must be implemented at school, district, and provincial levels as required. Comprehensive and appropriate moderation practices must be in place for the quality assurance of all subject assessments. The Formal School Based Assessment and the practical assessment tasks must be moderated by the relevant subject specialists at the district and, if required, provincial levels in consultation with the moderators at school.

Moderation serves five purposes:

1. It must ascertain whether subject content and skills have been sufficiently covered.
2. The moderator must ensure that the correct balance of cognitive demands is reflected in the assessments.
3. The assessments and marking are of an acceptable standard and consistency.
4. The moderator must make judgements about the comparability of learner performance across schools; whilst recognising that teachers teach in different ways.
5. The subject specialist/moderator must identify areas in which a teacher may need development and support and must ensure that this support is provided.

4.4.1 Internal moderation

Assessment must be moderated according to the internal moderation policy of the School, Provincial and National Departments. Moderation is a continuous process. The moderator's involvement starts with the planning of assessment methods and instruments and follows with continuous collaboration with and support to the assessors. Internal moderation creates common understanding of topics and skills and maintains these across the learning programmes.

4.4.2 External moderation

External moderation is conducted by the Districts and or Provincial offices, Department of Basic Education, Umalusi and, where relevant, the QCTO. The external moderator:

- Monitors and evaluates the standard of all summative assessments;
- Maintains standards by exercising appropriate influence and control over assessors;
- Ensures proper procedures are followed;
- Ensures summative integrated assessments are correctly administered;
- Observes a minimum sample of 12 summative assessments in total;

- Gives written feedback to the relevant quality assuror; and
- Moderates in case of a dispute between an assessor and a student.

Policy on inclusive education requires that assessment procedures for students who experience barriers to learning be customised and supported to enable these students to achieve their maximum potential.

Moderation is therefore an on-going process and not a once-off end-of-year event.

4.5 General

This document should be read in conjunction with:

- White Paper 6 on Special Needs Education: Building an Inclusive Education and Training System (2001);
- *National Policy Pertaining to the Programme and Promotion Requirements of the National Curriculum Statement Grades R – 12*; and (NPPPPR) (2011);
- *National Protocol for Assessment Grades R – 12. (NPA) (2011);*
- *Guidelines for Responding to Diversity in the Classroom through the Curriculum and Assessment Policy Statements* (2011);
- *Guidelines to Ensure Quality Education and Support in Special Schools and Special School Resource Centres* (2013);
- *Policy on Screening, Identification, Assessment and Support* (2014);
- *Guidelines for Full-service/Inclusive Schools* (2010); and
- *Standard Operating Procedures for Assessment of Learners who Experience Barriers to Assessment* (2016).

SECTION 5: RESOURCES