



Republic of Namibia

MINISTRY OF EDUCATION, ARTS AND CULTURE

SENIOR PRIMARY PHASE

**NATURAL SCIENCE AND HEALTH
EDUCATION SYLLABUS**

GRADES 4 - 7

For implementation 2016

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Natural Science and Health Education Syllabus Grades 4 – 7

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1. Introduction

This syllabus describes the intended learning objectives and assessment for Natural Science and Health Education in the Senior Primary level. As a subject Natural Science and Health Education is within the natural scientific area of learning in the national curriculum, but has thematic links to other subjects across the curriculum. Learning experiences in the natural scientific area aim at increasing the learners' knowledge and understanding of the physical and biological world of which they are part. The Natural Science and Health Education syllabi for the Senior Primary level/phase therefore integrate natural science, social, economic, physical, mathematical and technological learning areas of the broad curriculum and seek to motivate learners to effect changes in behaviour which promote good health and help them acquire and use the skills necessary to secure improvements in health.

Critical thinking, investigating phenomena, interpreting data, and applying knowledge to experimental skills are essential to understanding the value and limitations of natural scientific knowledge and methods, and their application to daily life. The application of scientific knowledge and attitudes to health is of special relevance for the individual, the family, and society as a whole. The Ministry of Education through NIED has agreed on a fixed review cycle.

2. Rationale

Learning experiences in the natural scientific area are focused upon promoting teaching and learning for understanding. Namibia, like most African countries, is rich in natural resources. The exploration of these resources requires scientific knowledge and relevant skills. The acquisition of scientific knowledge and technical skills presents itself as a prerequisite for a progressive national economy and the improvement of better standards of life for our people as envisaged in the country's long term strategic plan of Vision 2030. It is thus important for our learners to acquire knowledge and skills which will foster their understanding of the interaction of the human being and the environment in order to satisfy human needs. It must be understood that both the physical and biological world around us is quite complex and therefore need to be understood in a holistic manner by society in order to sustain the natural resources.

3. Aims

The main aim of the Natural Science and Health Education syllabus within the natural scientific area is therefore to provide basic scientific background for our learners with the hope of producing the much-needed scientists for the country. The Namibian society needs to be scientifically literate if it is to cope with challenges of appropriate global technology and economic advancement of the country.

4. Inclusive Education

The Senior Primary Phase of education promotes equality of opportunity to males and females, enabling both sexes to participate equally and fully. Teachers should know and understand how to treat learners equally, and all materials should support gender equity. Teachers must be aware of the ways in which boys or girls often become favoured in the classroom interaction, and ensure that their role promotes gender equity. Few learners will be able to manage the minimum number of competencies and should receive learning support through adapted teaching approaches, adapted materials, and assistance from peers. It is essential that the Senior Primary Phase creates motivation and confidence in girls as much as in boys in Natural Science and Health Education.

5. Links to Other Subjects and Cross-curricular Issues

The cross-curricular issues include Environmental Learning; HIV and AIDS; Population Education; Education for Human Rights and Democracy (EHRD), Information and Communication Technology (ICT) and Road Safety. These have been introduced to the formal curriculum to be dealt with in each subject and across all phases, because each of the issues deals with particular risks and challenges in our Namibian society. All of our learners need to:

- understand the nature of these risks and challenges
- know how they will impact on our society and on the quality of life of our people now and in the future
- understand how these risks and challenges can be addressed on a national and global level
- understand how each learner can play a part in addressing these risks and challenges in their own school and local community.

The main risks and challenges have been identified as:

- the challenges and risks we face if we do not care for and manage our natural resources
- the challenges and risks caused by HIV and AIDS
- the challenges and risks to health caused by pollution, poor sanitation and waste
- the challenges and risks to democracy and social stability caused by inequity and governance that ignores rights and responsibilities
- the challenges and risks we face if we do not adhere to road safety measures
- the challenges and risks we face from globalisation

Since some subjects are more suitable to address specific cross-curricular issues, those issues will receive more emphasis in those particular syllabuses. In this syllabus the following are links to cross-curricular issues:

Cross Curricular Issues	Grade 4-5	Grade 6	Grade 7
Environmental Education	Plants and their abiotic environment Ecosystem Soil Living organisms	Living organisms Plants Ecosystem	Diversity of organisms Ecology
HIV and AIDS	Health Education	Health Education	The body's immune system
Human Rights and Democracy	Environment	Ecosystem	Ecology
Information and Communication Technology	Process skills: Hand lens	Process skills: Hand lens	Process skills: Microscope

6. Approach to Teaching and Learning

The approach to teaching and learning is based on a paradigm of learner-centred education (LCE) described in ministerial policy documents and the LCE conceptual framework. This approach ensures optimal quality of learning when the principles are put into practice.

The aim is to develop learning with understanding, including, skills and attitudes required to contribute to the development of society. The starting point for teaching and learning is based on the fact that the learner brings to the school a wealth of knowledge and social experience gained continually from the family, the community, and through interaction with the environment. Learning in school should thus involve, build on, extend and challenge the learner's prior knowledge and experiences.

Learners learn best when they are actively involved in the learning process through a high degree of participation, contribution and production. At the same time, each learner is an individual with his/her own needs, pace of learning, experience and abilities. The teacher must be able to sense the needs of learners, the nature of the learning to be done, and how to shape learning experience accordingly. Teaching strategies must therefore be varied but flexible within a well-structured sequence of lessons.

The teacher should decide, in relation to the learning objectives and competencies in Natural Science and Health Education to be achieved, when:

- it is best to convey content directly
- it is best to let learners discover or explore information for themselves
- learners need directed learning
- learners need remedial and enrichment teaching and support
- there is a particular progression of skills or information that needs to be followed
- learners can be allowed to find their own way through a topic or area of content.

It is important to make sure that when learners work in groups, in pairs, individually, or as a whole class, the class must be organised appropriately to the task in hand. Co-operative and collaborative learning should be encouraged whenever possible. In such cases, tasks must be designed so that pair or group work is needed to complete it, otherwise the learners will not see any relevance in carrying out tasks together. As the learners develop personal, social and communication skills, they can gradually be given increasing responsibility to participate in planning and evaluate their work, under the teacher's guidance.

The learning content in this syllabus is based on the Namibian context, although the themes and topics are on a variety of scales to meet international standards. Teachers are therefore urged, where appropriate, to use local examples to illustrate scientific issues, concepts and processes.

7. End-of-phase Competencies

On completion of the Senior Primary phase in Natural Science and Health Education, all learners are expected to be able to:

Health Education

Demonstrate an understanding of the human body system and its importance to life with reference to the importance of healthy living (human body), the impact of health factors on their health, that of their families (substance abuse) and community.

Know and appreciate the transition from puberty to maturity (physical and emotional development) and know the consequences of risky sexual practices related to HIV and AIDS and STIs.

Scientific Processes

Know how to make and record measurements of length, volume, time, temperature, mass, electrical quantities, amount of substance and use SI units.

Understand basic laboratory rules and know how to handle apparatus/equipment and follow established safety procedures with regard to their safety during scientific investigations.

Use methods and skills of simple scientific models on the basis of existing and new information to communicate their investigations, analyses and conclusions using basic scientific and mathematical language.

Matter and Environment

Know different ecosystems by classifying materials and demonstrate an understanding that matter has different structural forms and characteristics.

Demonstrate an understanding of the properties of pure substances and mixtures, and describe these characteristics based on the particle theory.

Understand the structure, classification and physical properties of matter and relate to various forces that act on and within them.

Understand the value and vulnerability of, the care for and the sustainable use of natural resources in the natural environment, actions affecting the environment negatively and how these can be countered.

Generalise basic scientific knowledge and apply to everyday situations.

Living Organisms

Know how to identify living from non-living things, and relate scientifically to the characteristics of living organisms and understand the importance of different systems of the human body.

Demonstrate an understanding of the interdependence between plants and animals and relate to their life cycles and realise the impact of deforestation on the habitat and food chain of organisms (animals).

Energy

Know various forms, sources and characteristics of energy and energy transfer and recognise that energy takes various forms that can be classified based on their interaction with matter.

Understand the properties of light, in particular that light travels in a straight line and demonstrate an understanding that the sun is the principal source of energy.

8. Summary of the Learning Content

(Numbers correspond to the numbers in the learning content)

Grade 4	Grade 5	Grade 6	Grade7
HEALTH EDUCATION			
1. Health education	1. Health education	1. Social health 7. Human body	1. Health education 8. Human body
SCIENTIFIC PROCESSES			
2.1 Laboratory rules	2 Scientific processes	4.6 Equipment and procedures for cleaning water	2. Scientific processes
MATTER & ENVIRONMENT			
3. Matter and environment	3. Matter 5. Water 6. Soil 7. Air 9 Environment	2. Matter and forces 4. Water 5. Magnetism	3. Matter 4. Forces and energy 9 Environment
LIVING ORGANISMS			
5. Living organisms	8. Living organisms	6. Living organisms	7. Living organisms
ENERGY			
4. Energy	4. Sunlight	3. Electricity	6. Electricity 5. Light

9. Learning Content

9.1 Grade 4

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 4 learners should be able to:
TOPIC 1 HEALTH EDUCATION	
1.1 Personal Health	
<ul style="list-style-type: none"> realise the impact of personal health factors on their health and that of their families, and value the role of a clean environment know and understand factors that contribute to good health 	<ul style="list-style-type: none"> name personal health factors that affect their health and that of the families identify the relationship between healthy behaviour and personal health describe ways how to promote personal health identify foods that help to keep the body healthy list components of a healthy snack explain how healthy eating habits can improve their health
1.2 Dental Care	
<ul style="list-style-type: none"> realise the importance of healthy dental care 	<ul style="list-style-type: none"> state three functions of healthy teeth demonstrate correct teeth brushing technique
1.3 Diseases	
<ul style="list-style-type: none"> know basic environmental factors that influence the spread of communicable diseases related to their immediate environment, and their prevention 	<ul style="list-style-type: none"> list examples of communicable diseases (e.g. TB, measles, STIs, rabies etc.) state environmental factors that can cause the spread of communicable diseases name factors that enhance/promote the spread of communicable diseases (water supply, sanitation, food) describe how to prevent a further spread of these diseases
TOPIC 2 SCIENTIFIC PROCESSES	
This topic is an introduction to some of the basic scientific skills. The skills in this topic should not be taught in isolation as they form an integral part of the other topics.	
2.1 Laboratory Rules	
<ul style="list-style-type: none"> know basic laboratory rules <p>NOTE: Laboratory refers to any place where practical activities will take place.</p>	<ul style="list-style-type: none"> recognise basic laboratory rules: <p>Dos:</p> <ul style="list-style-type: none"> Do follow all instructions given by the teacher carefully Do ask the teacher when you are unsure what to do and need help Do wear eye protection when you are handling chemicals <p>Don'ts:</p> <ul style="list-style-type: none"> Don't enter the laboratory without a teacher

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 4 learners should be able to:
	<ul style="list-style-type: none"> ○ Don't run or play in the laboratory ○ Don't taste, eat, or drink anything in the laboratory ○ Don't touch chemicals or equipment unless you are told to do so ○ Don't point a test tube at your face or anyone else's face when you are heating it
TOPIC 3 MATTER & ENVIRONMENT	
3.1 Ecosystems	
<ul style="list-style-type: none"> ● know different ecosystems and be aware of their importance for human existence 	<ul style="list-style-type: none"> ● identify the different ecosystems from diagrams ● describe characteristics of marine, desert and savannah ecosystems ● identify examples of human activity that has beneficial or harmful effects on the environment (e.g. deforestation)
3.2 Types of soils found in Namibia	
<ul style="list-style-type: none"> ● know different types of soils in their local environment and realise that plants grow differently in these soils 	<ul style="list-style-type: none"> ● investigate and report on different types of soils in their local environment ● compare the similarities and differences of these soils (loam, clay and sand) in terms of colour ● investigate and report how plants grow in these soils
3.3 Matter	
<ul style="list-style-type: none"> ● understand that everything around us can be divided into matter and non-matter and that matter can be classified into living and non-living matter 	<ul style="list-style-type: none"> ● define the term matter ● outline the difference between matter and non-matter (for non-matter only restricted to heat, light and sound) ● recognise non-matter as a form of energy (with reference to Topic 4) ● classify matter into living and non-living groups ● differentiate living and non-living matter (differentiation for non-living confined to: "does not move on its own, grow, or reproduce")
3.4 Identification of states of matter	
<ul style="list-style-type: none"> ● know the three states of matter with reference to water as example 	<ul style="list-style-type: none"> ● observe and describe the three states of matter ● discuss the different forms in which water exists: solids, liquids, and gases
3.5 Water around us	
<ul style="list-style-type: none"> ● realise the importance of water in the environment and the importance of the sustainable use of water 	<ul style="list-style-type: none"> ● observe and report how water is used at home and at school ● state the importance of water for animals and plants

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 4 learners should be able to:
	<ul style="list-style-type: none"> outline ways how to use water sustainably
3.6 Water cycle	
<ul style="list-style-type: none"> know the basics of the water cycle as it occurs in their immediate environment and nature 	<ul style="list-style-type: none"> state the components of the water cycle describe the importance of the water cycle report on the effects of evaporation on surface areas
3.7 Importance of clean water	
<ul style="list-style-type: none"> know the difference between clean and contaminated water 	<ul style="list-style-type: none"> state the difference between clean water and contaminated water identify and record common ways that water is contaminated in their local environment
3.8 Air around us	
<ul style="list-style-type: none"> know characteristics of air in the local environment 	<ul style="list-style-type: none"> state the composition of air around us (nitrogen, oxygen and carbon dioxide) outline the importance of oxygen in the atmosphere for animals and humans recognise air as matter (with reference to 3.3) and wind as air with energy (reference to 4.1)
TOPIC 4 ENERGY	
4.1 Types of energy	
<ul style="list-style-type: none"> understand that energy is everywhere around us 	<ul style="list-style-type: none"> recognise non-matter as a form of energy (with reference to Topic 3) outline energy as the ability to do something or to move something outline that energy is everywhere in us, around us, in nature, light, wind, plant and animals identify different types of energy (heat energy, moving energy and light/solar energy) explain how energy is used every day at home and at school
4.2 Sources of energy	
<ul style="list-style-type: none"> know where energy comes from 	<ul style="list-style-type: none"> outline that all energy has a source recognise that energy is changing from one type to another without defining or stating the Law of Conservation of Energy differentiate between heat energy, movement energy and light/solar energy
4.3 Sunlight in our daily lives	
<ul style="list-style-type: none"> know the importance of sunlight in their local environment and know the location of the sun at different times of the day 	<ul style="list-style-type: none"> identify the sources in the home and school from which we get heat and light and explain how they relate to sunlight

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 4 learners should be able to:
	<ul style="list-style-type: none"> • observe and report on the location of the sun at dawn and sunset and the sun’s “movement” during the day • recognise sunlight as the most important source of heat and light on earth and • state how life on earth is dependent on the sun • observe and report on shadows at different times of the day and state that light travels in a straight line • describe how sunlight travels from the sun to the earth
TOPIC 5 LIVING ORGANISMS	
5.1 Living and non-living things	
<ul style="list-style-type: none"> • realise the difference between living and non-living things • understand that animals have different needs to survive and how they are adapted for different environments 	<ul style="list-style-type: none"> • state the three characteristics and the need of living organisms (they need to remember only these: growth, feeding, movement) • describe how animals are adapted for different environments • investigate some of the characteristics of life (growth, movement and feeding)
5.2 Plants (local)	
5.2.1 Flowering plants	
<ul style="list-style-type: none"> • know the major parts of flowering plants and functions of their parts and recognise how they are adapted to the environment 	<ul style="list-style-type: none"> • identify and compare the physical structures of flowering plants • describe the major parts of a flowering plant and state the functions of the parts • collect various flowers and compare the differences • describe how flowering plants are adapted to their environment in order to survive
5.2.2 Life cycle of flowering plants	
<ul style="list-style-type: none"> • know the stages in the life cycle of a bean/pea plant 	<ul style="list-style-type: none"> • observe and draw different stages in the life cycle of bean/pea plant • state the different stages in the life cycle of a bean/pea plant
5.3 Animals	
5.3.1 Variations among invertebrates	
<ul style="list-style-type: none"> • know the similarities and differences between invertebrates in their local environment 	<ul style="list-style-type: none"> • identify examples of invertebrates in their environment • compare the similarities and differences of some externally visible features of the following invertebrates: ants, flies and butterflies

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 4 learners should be able to:
	<ul style="list-style-type: none"> explain how to avoid harmful invertebrates in their environment (spiders and bees)
5.3.2 Life cycles of invertebrates	
<ul style="list-style-type: none"> know the main features of the life cycle of a butterfly and a bee 	<ul style="list-style-type: none"> identify some stages in the life cycles of a butterfly and a bee compare the differences in the life cycles of butter flies and bees
5.4 Nutrition	
5.4.1 Sources of food	
<ul style="list-style-type: none"> know that food can be found in different sources 	<ul style="list-style-type: none"> list the main sources of food identify food types from the main sources discuss the importance of the main food types for human health
5.5 Human body	
5.5.1 Different systems of the human body	
<ul style="list-style-type: none"> know that the human body consists of different systems and know where these systems are located 	<ul style="list-style-type: none"> identify from a given diagram the different systems of the human body describe the basic functions of the respiratory and excretory systems
5.6 Human development	
5.6.1 Stages of human development	
<ul style="list-style-type: none"> know and appreciate the stages of human development 	<ul style="list-style-type: none"> identify the stages of human development from diagrams

9.2 Grade 5

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 5 learners should be able to:
TOPIC 1 HEALTH EDUCATION	
1.1 Community health	
<ul style="list-style-type: none"> • realise the impact of local health factors and services on their health and that of their families and community, and value the role which Primary Health Care (PHC) can play in this regard 	<ul style="list-style-type: none"> • identify and report on local health factors and services affecting the health of individuals, families and the community • describe and relate how the lack of provision of local community health services affects the health of people at home or at school • state what is meant by PHC • outline the role of PHC • make and carry out a plan to promote activities that will improve the health situation at home and at school and support the PHC system • explain the concept of immunisation in simple terms • explain why children should be immunised against common diseases when they are young
1.2 Disease	
<ul style="list-style-type: none"> • know basic information about diseases, types of diseases, methods of prevention, and the impact of disease 	<ul style="list-style-type: none"> • state how to prevent malaria and TB • differentiate between HIV and AIDS in simple terms • investigate and describe misconceptions (myths) about HIV and AIDS • state ways in which HIV is and is not transmitted • explain why sexual abstinence before marriage and faithfulness after marriage are the most effective protection against possible HIV infection
1.3 Fitness and the human body	
<ul style="list-style-type: none"> • understand practices that contribute to health and apply these practices to their own lives 	<ul style="list-style-type: none"> • state how different physical activities and adequate rest contribute to health in terms of blood circulation, prevention of heart diseases, muscles and the support system • discuss practices which contribute to their own fitness based on their own lifestyles (e.g. draw, act out /role play)
1.4 Hygiene	
<ul style="list-style-type: none"> • realise the importance of hygiene and apply hygienic practices 	<ul style="list-style-type: none"> • describe how personal hygiene practices contribute to good health and recognise how this can be a social asset

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 5 learners should be able to:
	<ul style="list-style-type: none"> state practices for personal hygiene
TOPIC 2 SCIENTIFIC PROCESSES	
<p>This topic is an introduction to some of the basic scientific skills. The skills in this topic should not be taught in isolation as they form an integral part of the other topics.</p>	
2.1 Introduction to process skills	
<ul style="list-style-type: none"> know and understand the application of the basic process skills 	<ul style="list-style-type: none"> apply basic process skills included in a series of activities using magnifiers (e.g. observing structure of soil, germinating seeds, etc), rulers and thermometers follow a sequence of instructions to predict outcome of simple observations and formulate simple scientific questions recognise description or observations as what you do, or what you would see, hear, feel, smell and taste, in as much detail as possible with due regard to safety (e.g. with reference to topic 5.2, a learner is NOT able to “observe” melting or freezing but only change in size, temperature etc.)
2.2 Communicating scientific information skills	
<ul style="list-style-type: none"> know how to communicate simple observations 	<ul style="list-style-type: none"> record estimates and measurements of simple observations through drawing and discussion relate variable in observations with headings and labels of simple graphs, table and charts In tables the units should be given in the heading of the columns or with each entry but not both
TOPIC 3 MATTER	
3.1 Identification of states of matter	
<ul style="list-style-type: none"> know of materials which can exist in different forms (states of matter): solids, liquids, and gases 	<ul style="list-style-type: none"> state the forms in which water exists: ice, liquid water, and steam /vapour describe characteristics of solids, liquids and gases study and observe that when ice melts it forms water and when water evaporates it becomes a vapour explain the processes of evaporation and condensation investigate and explain the difference between steam and water vapour (boiling kettle) name common substances other than water which appear in two or more forms (candle wax, butter, chocolate, ice cream, petrol)

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 5 learners should be able to:
3.2 All materials have mass	
<ul style="list-style-type: none"> understand that all materials have mass 	<ul style="list-style-type: none"> explain and apply the principle that all materials have mass deduce that two objects have different masses (one is heavier, the other lighter) measure the mass of objects
3.3 Breakdown of materials (degradation)	
<ul style="list-style-type: none"> know that different materials degrade differently and at different rates 	<ul style="list-style-type: none"> evaluate that different materials degrade differently and at different rates (e.g. experiment where materials are covered with soil) explain and show how different materials break down through different sources /processes demonstrate and explain that materials exposed to the same processes may break down at different rates describe safe and unsafe ways to reuse wastes observe and record wastes that are produced at home, at school, or in their local environment explain and define biodegradable and non-biodegradable material and infer the implications of littering of these materials in their local environment
TOPIC 4 SUNLIGHT	
4.1 Sunlight in our daily lives	
<ul style="list-style-type: none"> understand the importance of sunlight in their local environment realise that light travels in straight lines 	<ul style="list-style-type: none"> discuss and explain how sunlight travels from the sun to the earth study the meaning of night and day with a drawing of the earth and sun investigate the making of a shadow clock or sundial and investigate how the sundial works collect data and report on local stories and cultural beliefs about the sun including how the sun might be used as a symbol, as in the Namibian flag
4.2 The effects of sunlight: heat and light	
<ul style="list-style-type: none"> understand the effects of heat and light on living organisms and non-living things in their local environment 	<ul style="list-style-type: none"> outline that the sun is the most important source of heat and light and the fact that life on earth is dependent on the sun investigate that the sun gives off heat investigate and report on the heating effect of sunlight on objects of different colours explain ways in which heat and light affect the activities and behaviours of animals and humans in their local environment

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 5 learners should be able to:
	<ul style="list-style-type: none"> • investigate and report on uses of heat and light in their local environment (evaporation of water, solar heating /cooking /power) • observe and report on ways in which heat and light affect the activities and behaviours of animals and humans in their local environment • experiment and report on how sunlight is the source of energy for green plants • identify dangers to eyes and skin from too much direct sunlight and describe preventive measures
4.3 Sources of heat and light	
<ul style="list-style-type: none"> • know sources of heat and light other than the sun 	<ul style="list-style-type: none"> • name and identify sources of heat other than the sun • discuss the effects of heating • investigate the expansion and contraction of solids, liquids and gases when heated and cooled
TOPIC 5 WATER	
5.1 Water around us	
<ul style="list-style-type: none"> • know sources of water in their local environment 	<ul style="list-style-type: none"> • describe the location and storage of water in their local environment (rivers, lakes, underground water, ocean, clouds, reservoirs, etc.) • investigate and report on local cultural beliefs, stories, and practices about gathering, transporting and using local water (traditional containers and rules for the storage of water; local rain patterns)
5.2 Water cycle	
<ul style="list-style-type: none"> • understand the water cycle in nature which entails repeated evaporation and condensation 	<ul style="list-style-type: none"> • discuss the roles which heating and cooling play in changing water from one phase to another, explain the way in which water changes from one phase to another in nature and indicate causes of water changing from a: <ul style="list-style-type: none"> – solid to a liquid (melting) – liquid to a vapour (evaporation) – vapour to a liquid (condensation) – liquid to a solid (freezing) • name the factors (wind and temperature/sun and surface area) which influence evaporation in nature • investigate one of the factors above (wind, temperature or surface area) in a practical experiment

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 5 learners should be able to:
	<ul style="list-style-type: none"> • distinguish between steam and vapour and observe that evaporation takes place without boiling • state that the clouds are caused by condensation of water when water evaporates • recognise that steam is caused by condensation of water when water boils • explain in simple terms the formation of <ul style="list-style-type: none"> – clouds – rain – dew – frost • discuss the water cycle in nature (repeated evaporation and condensation) as experienced in the local environment • describe the effects of evaporation for the local water resources (oshanas, dams and reservoirs) • sketch a diagram of the water cycle indicating the change of water from a liquid (streams and bodies of water) to a vapour to a liquid (rain, clouds or steam)
5.3 Importance of water to plants, animals, and humans	
<ul style="list-style-type: none"> • understand the relationships between water and plants, animals, and humans • appreciate the value and importance of water in their everyday life 	<ul style="list-style-type: none"> • describe the importance of water to plants, animals and humans • identify and report on ways in which water is used by plants, animals, and humans in their local environment • discuss the effect of lack of water on animals, humans and plants • state the uses of water at home, school and in their community
5.4 Importance of clean water	
<ul style="list-style-type: none"> • understand how local environmental health factors involving clean water affect the health of people in the home and at school 	<ul style="list-style-type: none"> • state the difference between clean water and contaminated water • identify and record common ways that water is contaminated in their local environment • discuss the importance of clean water (for plants and animals) • identify and state health factors in their local environment involving clean water and explain how they affect the health of people at home and at school • suggest ways that they can help to keep water clean • outline how water is made safe by boiling

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 5 learners should be able to:
5.5 Water conservation and storage	
<ul style="list-style-type: none"> understand the need and methods of storing and conserving water in their local environment know and apply practices that will conserve water at home and school 	<ul style="list-style-type: none"> list ways of conserving water and identify ways in which water is stored at home and in their community discuss the importance of water storage describe the various methods of storing water as applied in their community explain the importance of conserving water describe how water can be wasted and plan and report on practises that do not waste water at home and at school
TOPIC 6 SOILS	
6.1 Types of soils found in Namibia	
<ul style="list-style-type: none"> know different types and characteristics of soils in their local environment and realise that soil types differ in terms of water holding capacity and fertility 	<ul style="list-style-type: none"> investigate characteristics of different types of soil, locate and report on different types of soils in their local environment describe and compare the similarities and differences of these soils (loam, clay and sand) in terms of water holding capacity and fertility identify different types of soil: loam, clay and sand investigate and report on soil that has been damaged (e.g. eroded) in their local environment
6.2 Importance of soil	
<ul style="list-style-type: none"> know the value of soils in their local environment to plants, animals, and people and understand the relationship between soil and plants realise that crops (and consequently people) can be affected by various types of soil and realise that soil can be used for different purposes 	<ul style="list-style-type: none"> describe the value of soil in their local environment to plants, animals, and people describe the relationship between soil and plants that are found in their local environment (to anchor plants and provide required nutrients) investigate and report on ways that their local soils are used for building, pot making, traditional ornaments, etc. explain how crops (and, consequently, people) are affected by various types of soil in their local environment state ways in which soils are used for building, pot making and traditional ornaments
6.3 Fertility of soils	
<ul style="list-style-type: none"> know characteristics of humus and other components that make soil fertile and their importance to plant growth 	<ul style="list-style-type: none"> define humus and describe characteristics of humus state components of fertile soil: humus, minerals, air, and water

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 5 learners should be able to:
	<ul style="list-style-type: none"> • describe ways in which humus and other soil components are important to plants • investigate ways in which humus and other soil components are important to plants • explain how the components in soil are necessary for plants to grow
6.4 Making humus	
<ul style="list-style-type: none"> • understand how to make humus and apply humus to plants and realize the importance of humus in caring for a plant 	<ul style="list-style-type: none"> • explain how to make humus by composting plant and animal materials • list ways of applying humus to plants • discuss ways of applying humus to a plant and explain how to care for a tree or other plant
6.5 Conservation of soil	
<ul style="list-style-type: none"> • understand the importance and know practices of conserving soil in their local environment 	<ul style="list-style-type: none"> • state ways of conserving soil • discuss the importance of soil conservation • investigate and report on practices of soil conservation as found in their local environment
TOPIC 7 AIR	
7.1 Air around us	
<ul style="list-style-type: none"> • know the composition and characteristics of air 	<ul style="list-style-type: none"> • explain what the atmosphere is • state the composition of air around us (nitrogen, oxygen and carbon dioxide), state that nitrogen is the biggest fraction of air, and that oxygen is the most important for life • investigate the characteristics of air: <ul style="list-style-type: none"> – takes up space (volume) – has mass – can be compressed – warm air rises • state reasons for the presence of oxygen in the atmosphere, water and soil
7.2 Air that is moving (wind)	
<ul style="list-style-type: none"> • know and understand the movement of air (wind) and how this affects living and non-living things in their local environment 	<ul style="list-style-type: none"> • investigate wind as the movement of air • collect data and report on air movement in their local environment by making and using simple apparatus to study wind direction and wind strength • investigate and report on ways that air movement affects living and non-living things in their local environment (birds soaring, clouds drifting, windmills, water waves, sand movement, rocks weathering, kites flying, sail boats)

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 5 learners should be able to:
	<ul style="list-style-type: none"> • observe and explain some beneficial effects of moving air (e.g. seed dispersal, cooling effect, etc.) • observe and explain the effects of moving air that might be harmful to humans (e.g. tornadoes and hurricanes)
7.3 Air under pressure	
<ul style="list-style-type: none"> • understand the effects of air under pressure 	<ul style="list-style-type: none"> • observe, describe and report on the effects of air under pressure using simple apparatus such as: balloons, syringes, bicycle pumps and bicycle inner tubes
7.4 Air is a matter and has mass	
<ul style="list-style-type: none"> • understand that air is made of matter and thus has mass 	<ul style="list-style-type: none"> • state that, though air cannot be seen, it is made of matter and thus has mass • predict why a balloon filled with air is heavier than one without air • observe and report on the effect that warm air rises (e.g. over a candle, open fire, or heated ground) • explain why heated air is lighter than cold air
7.5 Air transmits sound	
<ul style="list-style-type: none"> • understand that air is a medium for the transmission of sounds 	<ul style="list-style-type: none"> • identify and describe sounds in their local environment • outline that sound is transmitted through the air • investigate and report on sound by making a musical instrument that transmits sound through air
TOPIC 8 LIVING ORGANISMS	
8.1 Characteristics of living organisms	
<ul style="list-style-type: none"> • be familiar with the characteristics of life and understand that there are seven characteristics (they need to remember only four: growth, feeding, reproduction and movement) • realize that these characteristics are important for the organism 	<ul style="list-style-type: none"> • state the difference between living and non-living things • define the terms feeding, movement and reproduction • list growth, feeding, reproduction and movement as the characteristics of living organisms • investigate the characteristics of life (growth, movement and feeding) • discuss the importance of these characteristics for the organisms
8.2 Plants (local)	
8.2.1 Variations among plants (flowering and non-flowering plants)	
<ul style="list-style-type: none"> • know the four groups of plants (mosses, ferns, conifers and flowering plants) and 	<ul style="list-style-type: none"> • list the four groups of plants: mosses, ferns, conifers and flowering plants

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 5 learners should be able to:
<ul style="list-style-type: none"> understand how leaves of the four groups of plants differ and are alike • know the major parts in the structure of a flowering and a non-flowering plant and understand that organs of plants have specific functions 	<ul style="list-style-type: none"> • discuss the differences and similarities among the four groups of plants in terms of their leaves • identify the major parts in the external structure of a flowering and non-flowering plant • investigate the structure of a flowering plant by collecting various flowers and sketch each collected examples • analyse the structure of a flowering plant • identify the major parts in the external structure of a flowering and non-flowering plant • list the major parts and functions of a flower • make a model of a flower • describe the functions of the stem, leaves and roots
8.2.2 Factors important for growth	
<ul style="list-style-type: none"> • know the factors important for the growth of a bean/pea plant 	<ul style="list-style-type: none"> • state factors important for the growth of a bean/pea plant • discuss the factors important for the growth of these plants
8.2.3 Dispersal of seeds/fruits	
<ul style="list-style-type: none"> • realise that seeds/fruits of flowering plants are dispersed (spread) in different ways and understand the importance of seed dispersal 	<ul style="list-style-type: none"> • describe different ways in which seeds/fruits from local plants, near home or school, are dispersed • outline the importance of seed/fruit dispersal • draw the structure of wind and animal dispersed seeds
8.3 Animals	
8.3.1 Variations among animals (including birds, mammals, reptiles)	
<ul style="list-style-type: none"> • know the similarities and differences among animals in their local environment and realise that some animals in their local environment can be harmful to humans 	<ul style="list-style-type: none"> • describe the similarities and differences of some externally visible features of birds, reptiles and mammals • name animals in their local environment which can be harmful to their health (e.g. certain snakes, scorpions and spiders) • describe different ways in which some animals can be harmful to humans • explain how to avoid harmful animals in their environment (snakes, spiders and scorpions)
8.3.2 Life cycles of animals	
<ul style="list-style-type: none"> • understand the main features of the life cycle of birds, mammals and reptiles and realise 	<ul style="list-style-type: none"> • identify some stages in the life cycles of a bird, a reptile or a mammal

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 5 learners should be able to:
that life cycles are generative (life begets life)	<ul style="list-style-type: none"> • find out about and report on the life cycle of a bird, mammal, reptile or an arachnid • discuss the similarities and differences in the life cycles of birds, reptiles, or mammals
8.4 Nutrition	
8.4.1 Sources of food	
<ul style="list-style-type: none"> • know and understand the importance of a balanced diet and realise that poor eating habits can lead to nutritional deficiencies 	<ul style="list-style-type: none"> • define a balanced diet as the diet containing all the necessary food substances in the right amounts • describe the effects of poor eating habits in relation to lack of a variety of food (e.g. goitre and marasmus) • describe how the effects of poor eating habits can be prevented through a balanced diet
8.5 Human Body	
8.5.1 Different systems of the human body	
<ul style="list-style-type: none"> • appreciate that the human body consists of different systems and know where these systems are located 	<ul style="list-style-type: none"> • identify from a given diagram the different systems of the human body and label the parts • describe the basic functions of each system (circulatory, reproductive, digestive, support and nervous systems)
8.5.2 Support system	
<ul style="list-style-type: none"> • know the structures of the human support system and identify the various parts 	<ul style="list-style-type: none"> • identify the structures of the human skeleton • explain how the skeleton acts as a support system of the body • identify parts of the body protected by the skeleton
8.5.3 Digestive system	
<ul style="list-style-type: none"> • know the various parts of the digestive system and acknowledge the necessity of its functions for healthy living • know the basic structure and function of teeth and be aware of activities/practices that can damage teeth 	<ul style="list-style-type: none"> • identify the different parts of the digestive system from a diagram • state the functions of each part identified • list activities/practices that can damage teeth • identify various teeth from given diagrams • describe the functions of various teeth • discuss good oral hygiene • describe the effect of too much sugar on teeth
8.6 Human development	
8.6.1 Physical development	
<ul style="list-style-type: none"> • realise and appreciate the physical changes 	<ul style="list-style-type: none"> • list the physical changes in maturing boys and girls

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 5 learners should be able to:
in boys and girls when maturing	<ul style="list-style-type: none"> • explain the kinds of physical changes which occur in maturing boys and girls (secondary sexual characteristics) • explain their physical development and appreciate this important step towards adulthood
TOPIC 9 ENVIRONMENT	
9.1 Ecosystems	
<ul style="list-style-type: none"> • know different ecosystems and be aware of their importance for human existence 	<ul style="list-style-type: none"> • identify the different ecosystems from diagrams • describe characteristics of an ecosystem in terms of living and non-living factors • explain the importance of an ecosystem for human existence
9.2 Animal dependency on plants	
<ul style="list-style-type: none"> • know ways that animals are dependent on plants 	<ul style="list-style-type: none"> • list animals that feed on plants (in their locality) • describe at least three ways that animals may be dependent on plants • describe how animals that eat other animals depend on plants • suggest what might happen to animals, in the local environment, if plants disappeared
9.3 Dependence of plants on animals	
<ul style="list-style-type: none"> • know different ways in which plants are dependent on animals 	<ul style="list-style-type: none"> • state ways in which plants are dependent on animals • list the potential pollinators of plants • investigate and record ways in which animals pollinate various flowering plants/flowers
9.4 Impact of overgrazing and deforestation on vegetation	
<ul style="list-style-type: none"> • realise that deforestation and overgrazing can have negative impact on the vegetation/environment 	<ul style="list-style-type: none"> • define deforestation and overgrazing • describe the impact of deforestation and overgrazing on vegetation • discuss how these negative impacts can be reduced

9.3 Grade 6

LEARNING OBJECTIVES Learners will:		COMPETENCIES Grade 6 learners should be able to:
TOPIC 1 SOCIAL HEALTH		
1.1 Puberty and sexual development		
<ul style="list-style-type: none"> know the basic structure of reproductive organs, physical changes when maturing from pre-adolescents to adolescents (puberty) and realise that sexual responses are normal know the difference between sex and sexual intercourse 	<ul style="list-style-type: none"> describe the differences between the reproductive organs of a male and a female (from given diagrams) explain the role of the basic structures of male and female reproductive organs discuss physical changes (e.g. voice changes, breast growth, pubic hair growth) and sexual responses (e.g. wet dreams, feelings of attraction, masturbation) that occur during puberty (in boys and girls) define sex as the biological definition of both male and female define sexual intercourse as a physical act between people involving reproductive organs 	
1.2 Physical development		
<ul style="list-style-type: none"> know the stages and characteristics of human growth development and understand and appreciate that each person grows and matures at a different pace understand physical changes in females at the onset of menstruation and realise that maturity and respect are important in interactions with others who are both similar and different than they are 	<ul style="list-style-type: none"> identify the stages and characteristics of human growth development from diagrams describe the physical changes that take place in humans from birth to death (infancy, toddler, childhood, adolescents adulthood and old age) explain how each person grows and matures at a different pace describe physical changes in females involving the menstrual cycle and relate it to conception list ways in which some learners are special and thus might require special attention suggest how they can show respect to others who are both similar and different than they are 	
1.3 Substance abuse		
<ul style="list-style-type: none"> understand the effects of substance abuse on individuals, families, communities and society and develop a desire to avoid substance abuse 	<ul style="list-style-type: none"> describe substance abuse identify the health, social and economic effects of alcohol, tobacco and drugs describe how the media are used to influence people to use alcohol discuss ways in which substance abuse can negatively influence their future identify sources of support for substance abusers and/or their families/loved ones 	
TOPIC 2 MATTER & FORCE		
2.1 Properties of materials		

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 6 learners should be able to:
<ul style="list-style-type: none"> know how to classify different types of materials and identify and compare properties of materials understand that some objects float in water while others sink 	<ul style="list-style-type: none"> outline that different types of matter have different material properties analyse everyday materials in their local environment to establish properties and uses of the materials investigate the collection of and identify different types of plastic, paper, glass, wood, fabric and metal identify and compare properties (such as hardness, texture, colour, lustre, flexibility, smell, brittleness and malleability) of paper, glass, cotton, plastic, wood, and metal compare and distinguish between objects by carrying out tests to determine which objects float and which sink in water
2.2 Materials and environment	
<ul style="list-style-type: none"> know the difference between natural, human-made and recycled materials 	<ul style="list-style-type: none"> explain the difference between natural or human-made (synthetic) material and identify and classify materials in the local environment as natural or human-made state the importance of recycling materials identify objects in their environment which are reused items or are made from recycled materials such as soda bottles, oil drums and paper
2.3 Forces	
<ul style="list-style-type: none"> know forces as integral parts of life 	<ul style="list-style-type: none"> identify forces in everyday life identify pushing and pulling forces (repulsion and attraction) state that forces are measured in newton name five effects of pushing and pulling forces, giving examples of each compare forces in terms of contact and non-contact forces name and identify different types of forces describe how to build a simple spring balance to measure different forces
TOPIC 3 ELECTRICITY	
3.1 Static electricity	
<ul style="list-style-type: none"> understand that static electricity exists and accumulates on certain materials and know lightning as a form of static electricity 	<ul style="list-style-type: none"> observe what occurs when they rub plastic combs with a dry cloth and then attract small pieces of paper to the comb observe what happens when an air-filled balloon is rubbed on a clean chalk board state that objects are either charged or uncharged (neutral)

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 6 learners should be able to:
	<ul style="list-style-type: none"> • explain the spark that jumps from a finger to a metal object when the air is dry • explain the relationship of a spark jumping from a finger to a metal object and of lightning striking from a cloud to another cloud or other object
3.2 Matter and electric current	
<ul style="list-style-type: none"> • understand that electricity can be used to light a bulb and understand that electricity can be dangerous 	<ul style="list-style-type: none"> • explain the proper use of electrical outlets and appliances • explain the danger of bare electrical wires • investigate the building of a simple flashlight by constructing a simple closed circuit which contains a single cell, a bulb and a switch
TOPIC 4 WATER	
4.1 Physical properties of water	
<ul style="list-style-type: none"> • understand the phase change of water and realise the role of perspiration in maintaining a constant body temperature 	<ul style="list-style-type: none"> • revise the water cycle (with more emphasis on the aspects of the cycle) and explain the importance of the phases (revision from Grade 5) • analyse and explain the basic properties of water (evaporation, surface tension, etc) and describe the phases in which water can change • compare and describe the rate of evaporation of water, in containers holding the same volume of water but with different surface areas • discuss the effects of evaporation on the local water resources (oshanas, dams and reservoirs) • explain that the evaporation of perspiration cools the body and keeps it at a safe temperature • investigate ways that other animals (dogs, cattle, cats, birds) cool themselves
4.2 Energy from water	
<ul style="list-style-type: none"> • understand that water could be used as a source of energy 	<ul style="list-style-type: none"> • show and explain how water and steam can be used as a source of energy (falling water/running water/hydro-electricity, e.g. Ruacana) • build a water wheel
4.3 Water as a solvent	
<ul style="list-style-type: none"> • understand factors that affect the rate of dissolving 	<ul style="list-style-type: none"> • define the concepts: solution, solvent, solubility, insolubility, dissolved substance, saturated and unsaturated solutions • state factors which influence the solubility of a substance • describe how the following will affect the rate of dissolving:

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 6 learners should be able to:
	<ul style="list-style-type: none"> - temperature - particle size - stirring • investigate and explain how crystals can be reclaimed from solutions
4.4 Importance of sufficient clean water	
<ul style="list-style-type: none"> • know about health problems found in Namibia related to the scarcity of clean water and understand how pit latrines and rubbish pits should be located so that they do not contaminate local water sources 	<ul style="list-style-type: none"> • discuss that the scarcity of clean water could lead to health problems of the eyes, skin and scalp • investigate preventive measures to avoid contracting these health problems • suggest why pit latrines should be built downhill from water sources • explain the location of household rubbish pits in improving sanitation and health
4.5 Water pollution and purification of contaminated water	
<ul style="list-style-type: none"> • understand the need to conserving clean water in their locality (home and school) and understand the effects of polluted water and know methods to clean water 	<ul style="list-style-type: none"> • discuss water as a solvent and its many uses in everyday life • describe ways of conserving water • explain the importance of conserving water • distinguish between clean/pure water and polluted water and examine pure and polluted water under the microscope • name and classify impurities which occur in water • describe the different purification techniques (as described in 4.6) • investigate and record how the local municipality uses the process of filtering • explain the need for purifying contaminated water by boiling • explain the importance of chlorination to remove bacteria, algae and fungi from water • name sources of water pollution • discuss the disadvantages and dangers of polluted water
4.6 Equipment & procedures for decanting, filtering and distilling of water	
Note: This topic is an introduction to some of the basic scientific skills. The skills in this topic should not be taught in isolation as they form an integral part of the other topics.	
<ul style="list-style-type: none"> • know appropriate techniques, how to handle apparatus/material competently and have due regard to safety 	<ul style="list-style-type: none"> • identify and outline the use of equipment (with reference to 4.6) • use appropriate techniques and handle, with due regard to safety, the following

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 6 learners should be able to:
<ul style="list-style-type: none"> know how to separate water, soluble and insoluble impurities by decanting, filtering and distilling 	<p>equipment: glass beaker, funnel, filter paper, flat-bottomed jar, spirit burner, Liebig condenser</p> <ul style="list-style-type: none"> investigate and describe the process of decanting whereby water is carefully poured into a second beaker, leaving behind the sediment or insoluble impurities investigate and describe the process of filtration whereby water is filtered resulting in a clear filtrate study the uses of filtration (e.g. municipalities that use large sand filters) investigate the process of distillation of a solution of water and soluble impurities
TOPIC 5 MAGNETISM	
5.1 Properties of magnets	
<ul style="list-style-type: none"> understand the effects and properties of magnets on a substance 	<ul style="list-style-type: none"> differentiate magnetic and non-magnetic substance investigate and explain how to test for magnets describe the effects of magnets on different substances sketch the magnetic field pattern that surrounds a bar magnet
5.2 Forces and fields between magnets	
<ul style="list-style-type: none"> know forces and effects of magnetic fields between magnetic substances 	<ul style="list-style-type: none"> investigate the polarity of a magnet and identify the north and south showing poles of the magnets name the north showing pole “north pole” and the south showing pole as “south pole” investigate and discuss the effects of magnetic poles on each other describe the magnetic field pattern that surrounds a bar magnet describe an experiment to indicate the existence of a magnetic field around a magnet
5.3 Making and use of magnets	
<ul style="list-style-type: none"> know how to make, use and store magnets 	<ul style="list-style-type: none"> investigate the directional properties of magnets in a compass in finding direction investigate magnetic forces as forces that can act over a distance study and investigate some uses of magnets investigate the making of a magnet by stroking a suitable metal with another magnet suggest and show the proper storing and safekeeping of magnets

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 6 learners should be able to:
TOPIC 6 LIVING ORGANISMS	
6.1 Characteristics of living organisms	
<ul style="list-style-type: none"> know and be familiar with five characteristics of living organisms (growth, feeding, reproduction, movement and respiration) and understand the basis of classifying living things 	<ul style="list-style-type: none"> list five characteristics of living organisms (growth, feeding, reproduction, movement and respiration) define respiration as the process by which energy is released from food explain the process of respiration in plants and animals describe growth, movement and feeding in living organisms
6.2 Plants	
6.2.1 Variations among plants	
<ul style="list-style-type: none"> know that flowering plants can be grouped into monocotyledons [monocots] (e.g. maize plants) and dicotyledons [dicots] (e.g. bean plants) and understand how leaves and flowers from different local trees and other plants differ and are alike realise that plants are the source of our food and the differences between cultivated and wild plants and their adaptation to a dry environment 	<ul style="list-style-type: none"> list examples of monocots and dicots as found in their local environment differentiate between monocots and dicots compare and explain how the leaves and flowers from different local trees and other plants differ and are alike identify plants from which processed foods come (bread, biscuits, breakfast cereals, crisps, cool drinks and sweets) distinguish different food crops in Namibia distinguish foods that come from plants grown outside Namibia describe how plants are sources of food identify and describe the differences between cultivated and wild plants describe characteristics of slow-growing and fast-growing plants as an adaptation to a dry environment
6.2.2 Plant and animal cells	
<ul style="list-style-type: none"> know the basic structure of cells and understand the importance of cells in living organisms 	<ul style="list-style-type: none"> describe the basic structure of plant cells (onion and geranium cells) and animal cells (liver cells) draw the general structure of an animal and plant cell identify the similarities and differences between plant and animal cells discuss the importance of cells in living organisms

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 6 learners should be able to:
6.3 Nutrition in plants	
6.3.1 Photosynthesis	
<ul style="list-style-type: none"> understand that green plants produce food through photosynthesis using the energy from the sun 	<ul style="list-style-type: none"> define photosynthesis as the process by which green plants produce their own food list the requirements for photosynthesis name the end products of photosynthesis explain how carbohydrates produced during photosynthesis are used as energy source in plants
6.4 Animals	
6.4.1 Variations among animals (including insects, fish and amphibians)	
<ul style="list-style-type: none"> realise that animals are classified into different groups 	<ul style="list-style-type: none"> give local example of the following animal groups: insects, amphibians and fish explain the criteria used to classify animals into different groups describe the external features used to classify animals compare the different groups of animals and infer why animals are grouped the way they are predict a model of an imaginary animal for one of the animal groups
6.4.2 Life cycle of animals	
<ul style="list-style-type: none"> understand the main features of the life cycles of two of the following: insects, amphibians or fish 	<ul style="list-style-type: none"> identify and name the stages in the life cycles of two common animals found in their local environment (insects, amphibians or fish) suggest a comparative outline on the life cycle of insects, amphibians and/or fish
6.4.3 Sustainable use of animals in Namibia	
<ul style="list-style-type: none"> understand the value of Namibia's wild and marine animals to the economy and the environment 	<ul style="list-style-type: none"> identify some of the common wild animals in Namibia's national parks explain the value of wild animals to the local and national economy explain the value of wild animals to the environment describe what is meant by endangered name one of Namibia's endangered animals name an animal product that Namibia uses from the sea
6.4.4 Care of animals	
<ul style="list-style-type: none"> understand how to feed and care for animals at home or at school 	<ul style="list-style-type: none"> list the needs of an animal in captivity (space, water, shade, air and/or food)

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 6 learners should be able to:
	<ul style="list-style-type: none"> explain how to feed and care for an animal (dog, goldfish/guppies) at school or at home
6.4.5 Animal dependency on plants	
<ul style="list-style-type: none"> understand the relationship between plants and animals 	<ul style="list-style-type: none"> describe the relationships between plants and animals investigate how animals are dependent on plants in their local environment describe how animals are dependent on plants in their local environment
6.5 Ecosystems	
<ul style="list-style-type: none"> know the basic terminology of ecosystems and understand the energy flow between organisms and understand the negative impact of human activities on the ecosystem/-environment 	<ul style="list-style-type: none"> explain the following terms: herbivores, carnivores, omnivores, food chain and food web construct simple diagrams of a food chain and food web to illustrate the flow of energy describe the differences and similarities between a food chain and food web discuss the flow of energy in a food chain discuss human activities that can influence the ecosystem negatively (at school, home and in the local community) suggest measures on how to prevent these negative impacts
TOPIC 7 HUMAN BODY	
7.1 Breathing system	
<ul style="list-style-type: none"> understand the basic structure and functions of the breathing system and know diseases that can affect the breathing system and realise that smoking can harm the lungs 	<ul style="list-style-type: none"> identify and label the structures of the breathing system describe the functions of the following parts: nasal cavity, voice box, wind pipe, ribs and diaphragm describe the path of air through the parts of the breathing system (demonstrate how the lungs get inflated with air using lungs of a goat or a sheep) explain inhaling and exhaling with reference to the ribs and diaphragm list common diseases of the breathing system describe how common diseases can be prevented (coughs, colds, asthma, bronchitis and TB) suggest how sustained exposure to polluted air and smoke can damage the lungs explain the effect of smoking on the lungs with reference to nicotine and tar state that smoking can lead to cancer, bronchitis and emphysema

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 6 learners should be able to:
7.2 Respiration	
<ul style="list-style-type: none"> • appreciate the role of respiration in living organisms and know the different forms of respiration 	<ul style="list-style-type: none"> • list the different forms of respiration • state the waste products of respiration • explain the importance of respiration in living organisms • carry out an (elementary) experiment to demonstrate the different forms of respiration
7.3 Circulatory system	
<ul style="list-style-type: none"> • appreciate and understand the role of the circulatory system and know its various parts 	<ul style="list-style-type: none"> • identify the parts of the circulatory system • describe the basic functions of the parts of the circulatory system (no in-depth study of the structure and functions of the various parts is required) • describe the functions of the chambers of the heart

9.4 Grade 7

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 7 learners should be able to:
TOPIC 1 HEALTH EDUCATION	
1.1 Sexuality and sexual health	
<ul style="list-style-type: none"> • understand that all humans are sexual beings but that sexual feelings bring new responsibilities • understand the term sexual (reproductive) health and know how to maintain sexual health • know risky sexual practices and the impact thereof on the community and society and understand the correct basic scientific information about STDs 	<ul style="list-style-type: none"> • identify from diagrams the different stages of sexual development from infancy to old age • investigate and report on different sources of information and support about sexual health and sexuality • explain what constitutes sexual health (physical and emotional) • explain why sexual health is important • discuss and compare methods of maintaining sexual health (abstinence, faithfulness, condom use) and identify abstinence as the most effective method • identify risky sexual practices (sex without a condom, multiple sexual partners, sugar daddies/mommies) • describe the impact (physical and emotional) of risky sexual practices on the individual, family, community and society • describe different ways of showing affection that are safe
1.2 STDs, HIV and AIDS	
<ul style="list-style-type: none"> • know what HIV is and understand the requirements for its transmission and HIV and AIDS and recognise that getting HIV is not inevitable in that it is preventable and realise that the abuse around HIV and AIDS increases the spread of the pandemic 	<ul style="list-style-type: none"> • describe sexually transmitted diseases (STDs) in terms of transmission, prevention, and consequences thereof • explain what HIV is • explain how HIV is transmitted and name the body fluids that can be infected with HIV • explain what HIV and AIDS are, how they attack and destroy the body, and that people with HIV usually don't show any signs or symptoms but they can still spread the disease • state three ways HIV is transmitted (blood contact, sexual intercourse, mother to child) and three ways it is not transmitted • state that no one knows for sure where HIV and AIDS came from but that they affect all kinds of people all over the world • explain that there is no cure yet for HIV/AIDS but there are life-prolonging treatments • discuss the myths and taboos around HIV and AIDS •

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 7 learners should be able to:
1.3 Teenage pregnancy and family planning	
<ul style="list-style-type: none"> know what it means to be a responsible parent and why and how to prevent teenage pregnancy 	<ul style="list-style-type: none"> discuss what it means to be a responsible parent and what qualities and resources are needed discuss why abstinence, contraceptives and condom use are requirements to prevent teenage pregnancy explain why teenage pregnancy should be prevented (both for mother and child) define fertilisation as the joining of male and female sex cells explain how to prevent pregnancy (e.g. abstinence, contraceptives, condoms)
TOPIC 2 Scientific Processes	
<p>This topic is an introduction to some of the basic scientific skills. The skills in this topic should not be taught in isolation as they form an integral part of the other topics.</p>	
2.1 Estimating & measuring	
<ul style="list-style-type: none"> know how to estimate and measure length, mass, time, temperature and the area of regularly shaped (right-angled) objects 	<ul style="list-style-type: none"> estimate and measure: <ul style="list-style-type: none"> length, mass, time and temperature temperature of melting ice the height of fellow learners and the mass of school bags using an appropriate method calculate the area of regularly shaped (right-angled) objects convert minutes and hours to seconds convert units of length, mass and area follow sequence of instructions; use appropriate techniques; handle apparatus/material competently and have due regard for safety record estimates and measurements accurately report experimental observations and data
2.2 Observing	
<ul style="list-style-type: none"> know how to observe properties such as colour, size, feel, sound, shape and smell of a variety of substances 	<ul style="list-style-type: none"> observe properties such as colour, size, feel, sound, shape and smell of a variety of substances observe properties of a variety of common substances such as sugar, salt, tea, coffee, sand, pepper and flour report experimental observations and data (revision of Grade 5)

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 7 learners should be able to:
2.3 Classifying	
<ul style="list-style-type: none"> know how to group common objects in a number of different ways 	<ul style="list-style-type: none"> compare properties of common objects classify objects in a variety of ways
TOPIC 3 Matter	
3.1 Nature of matter	
<ul style="list-style-type: none"> know the characteristics of a variety of matter 	<ul style="list-style-type: none"> characterise a variety of matter by its colour, smell, taste, melting point and boiling point describe different properties of substances name the three states of matter investigate to show that different substances have different properties
3.2 Building blocks of matter	
3.2.1 Atoms and molecules	
<ul style="list-style-type: none"> know that every element has a name and a symbol (know at least the first 10 elements, as well as C, O, U, Cu, Au, Fe, Ag, Al, N, Pb, Cl) 	<ul style="list-style-type: none"> state that atoms are the smallest building blocks of matter explain that all matter consists of elements or combinations thereof state that the Periodic Table is a classification of all existing elements classify elements into metals and non-metals state that every element has a name and a symbol (know at least the first 10 elements, as well as C, O, U, Cu, Au, Fe, Ag, Al, N, Pb, Cl)
3.2.2 Elements and compounds	
<ul style="list-style-type: none"> know that atoms combine to form compounds, which are the building blocks of all material (an extension of the particle model) and understand the difference between an element and a compound 	<ul style="list-style-type: none"> state that elements combine together chemically to form compounds (e.g. water, H₂O and carbon dioxide, CO₂) name practical examples of most common elements, compounds and mixtures found in everyday life, the earth's crust, the atmosphere and water
3.2.3 Mixtures and solutions	
<ul style="list-style-type: none"> know the difference between elements, mixtures and compounds and understand that compounds can be pure substances 	<ul style="list-style-type: none"> observe examples of commonly known substances to show and explain the difference between elements, mixtures and compounds describe the mixing of substances to make solutions as a physical process demonstrate and investigate the mixing of solids and solids, solids and liquids, and liquids and liquids

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 7 learners should be able to:
	<ul style="list-style-type: none"> • experience and explain that the components of mixtures can be separated by methods (through simple experiments, e.g. with iron filings and sulphur), but not those of compounds as they have chemically combined • describe the separation (physical change) of mixtures and solutions, e.g. sorting with a magnet, evaporation, filtration and distillation • investigate to separate the components of mixtures, e.g. by hand sorting (different size stones), using a magnet (iron and sulphur), evaporation (salt and water), filtration (silt and water) and distillation (water and ink)
3.3.1 Air around us	
<ul style="list-style-type: none"> • know the composition of air and be able to test for the presence of water, oxygen, and carbon dioxide 	<ul style="list-style-type: none"> • state the composition of air in the atmosphere (oxygen, carbon dioxide & nitrogen) • investigate the presence of water vapour and carbon dioxide in the air • describe the glowing splint test for gasses • investigate and test for the following: <ul style="list-style-type: none"> – water vapour – carbon dioxide – oxygen • state and demonstrate that air supports combustion • state and demonstrate that one fifth of the air around us consists of oxygen which supports combustion/respiration • state that four fifths of the air around us consists of nitrogen which does not support combustion • name two substances or compounds which are essential for combustion • explain how to put out fire (a camp fire, household fires, electrical fires)
TOPIC 4 FORCES AND Energy	
4.1 Nature and effects of forces	
<ul style="list-style-type: none"> • know forces as integral parts of life 	<ul style="list-style-type: none"> • identify and name forces • describe pushing and pulling (repulsion and attraction) • classify forces into contact and non-contact forces • state that forces are measured in newton

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 7 learners should be able to:
	<ul style="list-style-type: none"> • name five effects of pushing and pulling forces, giving examples of each
4.2 Weight and mass	
<ul style="list-style-type: none"> • know the existence of the earth's gravitational pull and the earth's gravitational field constant 	<ul style="list-style-type: none"> • explain why objects fall to earth • explain the existence of the earth's gravitational pull and the earth's gravitational field constant • identify and compare the effects of earth's gravitational pull on different objects • explain weight as a manifestation of earth's gravitational pull • explain the difference between weight and mass
4.3 The solar system and gravitation	
<ul style="list-style-type: none"> • know that we live on a planet, which, along with eight other planets, is around our sun 	<ul style="list-style-type: none"> • describe the paths of the planets as orbitals • draw a diagram of the solar system which depicts the planet's relative distances from the sun • state that Mars is earth's nearest neighbour and has similarities to the earth • discuss some ways the earth and Mars are similar and some ways they differ
4.4 Sources of energy	
<ul style="list-style-type: none"> • know the different sources of energy that are available to people and know the difference between renewable and non-renewable energy sources 	<ul style="list-style-type: none"> • investigate and name the energy sources available in their local environment • investigate how energy sources are used • list the most important energy sources for Namibia • identify four fuels commonly used • distinguish how the fuels identified are used • state that fuels are limited and that energy sources can be exhausted • distinguish between renewable and non-renewable energy sources in the local environment • explain how energy sources are used
4.5 Energy in everyday examples	
<ul style="list-style-type: none"> • understand that people use energy for their everyday renewable and non-renewable energy 	<ul style="list-style-type: none"> • describe energy as the ability to do work • outline that people use energy for their everyday living requirements • distinguish between different forms of energy

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 7 learners should be able to:
	<ul style="list-style-type: none"> • state the law of energy conservation • identify energy conversions and identify different forms of energy conversions in practical examples • describe the movement of energy through the local environment (by naming the different types of energy)
TOPIC 5 Light	
5.1 Basic concepts of light	
<ul style="list-style-type: none"> • know that light travels in straight lines and how this leads to the formation of shadows • understand how small scale solar technology works 	<ul style="list-style-type: none"> • state the difference between luminous and illuminated objects • explain that light travels in straight lines and how this leads to the formation of shadows • find out about and report on ways of heating and cooking using the sun (e.g. a solar oven)
5.2 Dispersion of light	
<ul style="list-style-type: none"> • understand that sunlight is composed of various colours 	<ul style="list-style-type: none"> • observe and state that sunlight is a mixture of different colours which can be separated (by using a prism, drop of oil on water, or other methods) • analyse sunlight to conclude that it is composed of various colours and identify the different colours of white light • state the colours of white light in the correct order [ROYGBIV] • find out and report on local stories involving the rainbow
5.3 Transmission, absorption and reflection	
<ul style="list-style-type: none"> • understand the properties of light by using different apparatus 	<ul style="list-style-type: none"> • explain divergent, convergent and parallel rays or beams of light • investigate what happens when light falls on transparent, translucent (glass surface of solar panels), and opaque surfaces • use apparatus such as a torch, mirror, glass window, Perspex ruler, and black plastic to explain properties of light
5.4 Reflection by mirrors	
<ul style="list-style-type: none"> • know reflections in plane mirrors, using ray boxes or pins, so as to determine the position, nature and size of the image 	<ul style="list-style-type: none"> • describe the formation and give the characteristics of an optical image formed by a plane mirror • investigate reflection in plane mirrors, using ray boxes or pins, so as to determine the position, nature and size of the image • identify everyday applications of reflection such as the uses of different kinds of mirrors,

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 7 learners should be able to:
the reflecting surfaces behind lights and the reflecting surfaces behind solar cookers	
TOPIC 6 Electricity	
6.1 Static electricity	
<ul style="list-style-type: none"> understand charge, know how to charge objects 	<ul style="list-style-type: none"> explain the existence of electrons explain the existence of charge due to the imbalance of electrons and protons explain that charging by friction simply means the separation of charges describe how objects can be charged by friction study and explain the effects of charged objects on one another describe and investigate how it is possible for different objects to attract and repel each other due to their charges investigate ways of charging objects by friction, e.g. combs, pens, glass and Perspex rods, plastic straws and pens rubbed on wool, silk, and hair explain examples in everyday life where charging takes place by friction as in <ul style="list-style-type: none"> walking on a carpet pulling off a jersey pulling blanket and sheets apart
6.2 Electroscopes	
<ul style="list-style-type: none"> know the working of an electroscopes 	<ul style="list-style-type: none"> explain and demonstrate how an electroscopes can be charged explain and demonstrate the use an electroscopes to test for charges explain and demonstrate how charges on a charged electroscopes are able to discharge by flowing to the earth explain earthing with reference to electroscopes
6.3 Electric current	
<ul style="list-style-type: none"> understand current as the movement of charge 	<ul style="list-style-type: none"> explain the term discharge as the movement of charge (electrons) state lightning as a form of discharge state that moving charges (positive or negative) are known as an electric current outline that electric current is determined by the flow of charges discuss the difference between static electricity and electric current

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 7 learners should be able to:
	•
6.4 Electrical sources	
<ul style="list-style-type: none"> • know that electrical current requires a source • realise that a cell is a source of chemical energy which can be used to produce electrical energy 	<ul style="list-style-type: none"> • state that electrical current requires a source • discuss that a cell is a source of chemical energy which can be used to produce electrical energy • state that a cell has positive and negative terminals • state that electrical current is the flow of charges <ul style="list-style-type: none"> – negative charges (e.g. electrons) move from a negative to a positive terminal – positive charges move from a positive to a negative terminal • state that current will only flow in a closed circuit • describe the difference between a closed and an open circuit
6.5 Conductors and insulators	
<ul style="list-style-type: none"> • know what a conductor and an insulator is 	<ul style="list-style-type: none"> • explain what a conductor and an insulator is • use an electroscope to test for conductors and insulators • compare substances to see which are better conductors, e.g. metals, plastic, wood, water and solutions
6.6 Cells and bulbs in series and parallel	
<ul style="list-style-type: none"> • know how to construct simple circuits and draw the circuit symbols 	<ul style="list-style-type: none"> • explain how to construct and draw (using circuit symbols) a circuit using a cell, conductor wires, a switch and a bulb • construct series and parallel circuits using a cell, conductor wires, a switch and a bulb • sketch and identify circuit symbols for a cell, conductor wires, a switch and a bulb
TOPIC 7 LIVING ORGANISMS	
7.1 Characteristics of living organisms	
<ul style="list-style-type: none"> • know and understand all the basic characteristics of living organisms 	<ul style="list-style-type: none"> • list and define the characteristics of all organisms • discuss the importance of these characteristics for the survival of the organisms • describe sensitivity as the important principle for survival • identify given organisms using a simple key

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 7 learners should be able to:
7.2 Plants	
7.2.1 Flowering and non-flowering plants	
<ul style="list-style-type: none"> realise the difference between flowering and non-flowering plants and understand the adaptability of plants to their specific environment 	<ul style="list-style-type: none"> identify structures of a non-flowering plant describe the differences and similarities between flowering and non-flowering plants describe the functions of plant structures (flowering and non-flowering plants) describe the functions of fibrous and tap roots describe the adaptations of <i>Welwitschia mirabilis</i> in Namibia
7.2.2 Movement of particles and molecules: diffusion	
<ul style="list-style-type: none"> appreciate that diffusion is an important process for the movement of molecules/particles 	<ul style="list-style-type: none"> relate diffusion to random movement of particles from a region of high concentration (a lot) towards a region of lower concentration (little) discuss the importance of diffusion for living organisms
7.2.2 Animals: variations among animals (including mammals, birds, reptiles, fish, insects and amphibians)	
<ul style="list-style-type: none"> understand how to classify animals into their major groups and how they are adapted to the environment for survival 	<ul style="list-style-type: none"> (revise grades 5 and 6 work as outlined – one added feature for animals with backbones and two added features for animals without backbones) explain the criteria used to classify each animal group describe the life cycles of a local insect and a mammal describe how a fish and an insect (as selected in their locality) are adapted to their environment
TOPIC 8 HUMAN BODY	
8.1 Physical development	
<ul style="list-style-type: none"> realise and appreciate the physical changes in boys and girls when maturing and acquire knowledge about human reproductive parts 	<ul style="list-style-type: none"> explain the kinds of physical changes which occur in maturing pre-adolescent boys and girls (secondary sexual characteristics of boys and girls) identify the different structures in male and female reproductive systems from diagrams state the functions of the various parts of the male and female reproductive systems
8.2 Different systems of the human body	
<ul style="list-style-type: none"> appreciate that the human body consists of different systems and know where they are located in the human body 	<ul style="list-style-type: none"> (revise the system as done in grade 5 syllabus) identify and label the different systems of the human body describe the basic functions of each system explain the importance of these systems for human existence

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 7 learners should be able to:
8.3 Digestion	
<ul style="list-style-type: none"> • understand how food nutrients are made available to the body and know different forms of digestion • realise the importance of chewing food and know the importance of enzymes in the digestion of food 	<ul style="list-style-type: none"> • define digestion as the breakdown of food substances into soluble substances • describe the different forms of digestion • discuss the importance of chewing food • define enzymes as biological catalysts (proteins) which speed up or slow down a reaction but do not get used up during the reaction • state the end-products of starch, fat and protein digestion
8.4 Excretion	
<ul style="list-style-type: none"> • understand the basic structure and function of the excretory organs 	<ul style="list-style-type: none"> • identify the different excretory organs • identify and label the different structures of the kidney (ureter, urethra and bladder) • name the substances removed from each organ
8.5 Nervous system and drugs	
<ul style="list-style-type: none"> • understand the basic structure and function of the nervous system and the influence of drugs on it 	<ul style="list-style-type: none"> • identify the human nervous system from diagrams in terms of the central and peripheral nervous system • identify a reflex arc from diagrams • explain the basic function of the reflex arc • describe the influence of drugs on the nervous system
TOPIC 9 ENVIRONMENT	
9.1 Ecosystems	
<ul style="list-style-type: none"> • understand the basic terminology of the ecosystem and know the characteristics of the three ecosystems common to Namibia • realise the importance of the interrelationship between biotic and abiotic factors in the local environment and understand ways in which human activities affect a local environment and influence the health of people in the community • appreciate the importance of energy flow in an ecosystem and understand why this is 	<ul style="list-style-type: none"> • explain the following terms: ecosystem, habitat, community, population and species • study the structure and make-up of an ecosystem in their locality • list the different ecosystems commonly found in Namibia • describe the characteristics of each ecosystem in terms of living and non-living factors • outline the interrelationship of the organisms found in an ecosystem • investigate human activities which have a positive and negative impact on the environment • describe how the above mentioned impacts will influence the health and well-being of people in the community • describe the energy flow through living organisms within the chosen local environment

LEARNING OBJECTIVES Learners will:	COMPETENCIES Grade 7 learners should be able to:
important for the survival of organisms in that ecosystem	(food chain, food web) • discuss the importance of energy flow through an ecosystem
9.2 Conservation of soil	
• appreciate and understand the importance of conserving soil	• list ways of conserving soil • describe ways of conserving soil • discuss the importance of conserving soil • investigate and report on practices of soil conservation as found in their local environment
9.3 Air pollution	
• understand the effects of polluted air	• describe at least three sources of air pollution (wood smoke from cooking fires and burning bush, exhaust fumes from cars, mica dust, smoke from electric power stations and mine smelting stations) • distinguish between human-made and natural air pollution • explain how sustained exposure to polluted air could affect their lungs • name controls and regulations against air pollution and suggest ways to prevent the harmful effects • outline global warming as one of the effects of increasing air pollution

10. Assessment

A learner-centred curriculum and learner-centred teaching use a broad range of knowledge and skills which are relevant to the knowledge-based society. The competencies in the syllabuses state what understanding and skills a learner must demonstrate as a result of a teaching-learning process, and which will be assessed. However, it is intended that the curriculum be learning-driven, not assessment- and examination-driven. Assessment and examination are to support learning. For more information about differentiated assessment, please refer to the National Promotion Policy Guide for Formal Basic Education.

10.1 Types and methods of assessment

Continuous assessment

In order to capture the full range and levels of competence, a variety of formal and informal continuous assessment situations is needed to give a complete picture of the learner's progress and achievements in all subjects. Continuous assessment must be clear, simple and manageable, and explicitly anchored in learner-centred principles and practice. Teachers must elicit reliable and valid information of the learner's performance in the basic competencies. The information gathered about the learners' progress and achievements should be used to give feedback to the learners about their strong and weak points, where they are doing well, and why, and where they need to try more, how, and why. The parents should be regularly informed about the progress of their child in all subjects, be encouraged to reward achievements, and given suggestions as to how they can support their learning activities. The learner's progress and achievements in all subjects must be reported to parents on the school report.

Formative assessment

The two modes of assessment used are formative continuous assessment and summative assessment. Formative continuous assessment is any assessment made during the school year in order to improve learning and to help shape and direct the teaching-learning process. Assessment has a formative role for learners if and when:

- it is used to motivate them to extend their knowledge and skills, establish sound values, and to promote healthy habits of study;
- assessment tasks help learners to solve problems intelligently by using what they have learned;
- the teacher uses the information to improve teaching methods and learning materials.

Summative assessment

Summative assessment is an assessment made at the end of the school year based on the accumulation of the progress and achievements of the learner throughout the year in a given subject, together with any end-of-year tests or examinations. The result of summative assessment is a single end-of-year promotion grade.

Diagnostic Assessment

Barriers to learning, strengths, learning difficulties and gaps in learning can be determined through diagnostic assessment, which takes place at any time during the learning process. Diagnostic assessment should include inputs from the multidisciplinary support team. It informs lesson planning and which learning and teaching methods should be used to support the learners.

Informal and formal methods

The teacher must assess how well each learner masters the basic competencies described in the subject syllabuses and from this gain a picture of the all-round progress of the learner. To a large extent, this can be done in an informal way through structured observation of each learner's progress in learning and practice situations while they are investigating things, interpreting phenomena and data, applying knowledge, communicating, making value judgements, and in their participation in general.

When it is necessary to structure assessment more formally, the teacher should as far as possible use the same sort of situation as ordinary learning and practice situations to assess the competency of the learner. The use of formal written and oral tests can only assess a limited range of competencies and therefore should not take up a great deal of time. Short tests in any subject should be limited to part of a lesson and only exceptionally use up a whole lesson. End-of-term tests should only be written in the first lesson of the day, so that teaching and learning can continue normally for the rest of the time. No end-of-term examinations may be written.

Evaluation

Information from informal and formal continuous assessment is to be used by the teacher to know where it is necessary to adapt methods and materials to the individual progress and needs of each learner. At the end of each main unit of teaching, and at the end of each term, the teacher, together with the learners, should evaluate the process in terms of tasks completed, participation, what the learners have learnt, and what can be done to improve the working atmosphere and achievements of the class.

Criterion-referenced grades

When grades are awarded in continuous assessment, it is essential that they reflect the learner's actual level of achievement in the competencies, and are not related to how well other learners are achieving or to the idea that a fixed percentage of the learners must always be awarded a Grade A, B, C, and so on (norm-referencing). In criterion-referenced assessment, each assessment task must have an assessment rubric with criteria descriptors for what the learner must demonstrate in order to be awarded the grade. It is important that teachers in each department/section work together to have a shared understanding of what the criteria descriptors mean, and how to apply them in continuous assessment, so that grades are awarded correctly and consistently across subjects. Only then will the assessment results be reliable.

10.2 Grade Descriptors

The learner's level of achievement in relation to the competencies in the subject syllabus is shown in letter grades. When letter grades are awarded, it is essential that they reflect the learner's actual level of achievement in relation to the competencies. In Grades 1 to 3, letter grades are related to a six-point performance scale, while in Grades 4 to 12 letter grades are related to percentages. The relation between the grades awarded and competencies are shown below.

Grade	% Range (Gr. 4-12)	Competency Descriptions
A	80%+	Achieved competencies exceptionally well. The learner is outstanding in all areas of competency.
B	70-79%	Achieved competencies very well. The learner's achievement lies substantially above average requirements and is highly proficient in most areas of competency.
C	60-69%	Achieved competencies well. The learner has mastered the competencies satisfactorily in unknown situations and contexts.
D	50-59%	Achieved competencies satisfactorily. The learner's achievement corresponds to average requirements. The learner may be in need of learning support in some areas.
E	40-49%	Achieved the minimum number of competencies to be considered competent. The learner may not have achieved all the competencies, but the learner's achievement is sufficient to exceed the minimum competency level. The learner is in need of learning support in most areas.
U	0-39%	Did not achieve the minimum number of competencies. The learner has not been able to reach a minimum level of competency, even with extensive help from the teacher. The learner is seriously in need of learning support.

10.3 Assessment Objectives

The assessment objectives in Natural Science and Health Education are:

<p>A Knowledge with Understanding</p> <p>Requires the learner to identify, give examples, name, list, indicate, define and recognise.</p>
<p>B Handling Information, Application of Knowledge and Solving Problems</p> <p>Requires the learner to use various forms of information to select, explain, deduce, draw, relate, describe, calculate, find, estimate, predict, determine, analyse, extract and analyse, arrange, compare and discuss, suggest, evaluate, interpret and distinguish. Learners may be asked to translate information from one form to another, for example from tables, graphs and pictures.</p>
<p>C Practical (experimental and investigative) Skills and Abilities</p> <p>Requires the learner to carry out an investigation, present a report to their class, collect data and information and create a display, construct, write an essay, conduct a survey, demonstrate practically, produce a poster, write out a news report and analyse.</p> <p>The three skills for Objective C: Practical (experimental and investigative) skills and abilities are:</p> <ul style="list-style-type: none"> • Skill A: Practical techniques • Skill B: Observing, measuring and recording and • Skill C: Handling, processing and evaluating data

10.4 Continuous Assessment: Detailed Guidelines

A specified number of continuous assessment activities per term should be selected, graded and recorded. Not more than two assessments per term are to be topic tests. These continuous assessments must be carefully planned and marked according to a marking scheme, marking criteria or memorandum. Detailed guidance can be found in the Continuous Assessment Manual for Natural Science and Health Education. The criteria used to assess activities other than tests should be given to the learner before the assessment activity. Evidence of the work produced by good, average and low-achieving candidates, as well as the written assignment and marking scheme, has to be kept at school until the end of the next year. Teachers can choose to grade and/or record more than the required continuous assessments if it is necessary for formative purposes. An end-of-year summative grade will be based only on the assessment tasks described in the syllabus. End-of-term tests should not contribute more than thirty percent (30%) towards the total term mark. Not more than forty percent (40%) of the summative grade may be based on tests, which include topic tests and end-of-term tests.

Types of Continuous Assessment

Practical Investigations: These are assessments of practical skills done during a practical activity where learners are required to plan and carry out investigations, and collect, report and analyse information. Except for one big investigation or project during the first or second term, these activities should assess not more than two skills and should count 15 marks each.

Topic Tasks: These are activities that most teachers already use in their day-to-day teaching. These are recorded, assessed activities that could introduce a topic, be used during the teaching of a topic and/or revision of a topic. They may well include assessment involving competencies to do with locating information, conducting surveys, analysing information or presenting information. Topic tasks will involve assessments of basic competencies in all assessment objectives; however, not all assessment objectives need to be present in every topic task. The greatest emphasis should be placed on assessment objectives B and C (see section 12.4) to meet the weighting shown in the Test Specification Grid on page 53.

Projects: A project is a longer assignment than a topic task or practical investigation, and gives learners an opportunity to complete an investigation into one of the themes/topics outlined in the syllabus. This type of investigation will enable the teacher and learner to pursue a topic in greater depth and in a more lively and creative way than possible with short discrete topic tasks or practical investigations. The project should count 30 marks and the final mark should be divided by two (to give 15 marks – same as the practical investigations) when entered into the record forms under 'Practical Investigation' in the second term.

Topic Tests: Completed topics should be concluded with a test indicating the achievements of the learners in these topics.

End-of-Term Test: This will be a more comprehensive topic test of the term's work. No homework should be assigned during the time of writing the end of term tests.

Summary of Continuous Assessment Tasks

Continuous Assessment Grades 4						
Components	Term 1		Term 2		Term 3	
	Number & Marks	Total	Number & Marks	Total	Number & Marks	Total
Practical Investigations	2 × 10	20	2 × 10	20	1 × 10	10
Topic Tasks	2 × 10	20	2 × 10	20	2 × 10	20
Topic Tests	$(2 \times 10) \div 2$	10	$(2 \times 10) \div 2$	10	1 × 10	10
End-of-Term Test	1 × 20	20	1 × 20	20		
Term Marks		70		70		40
Weighted Term Marks for Report		100		100		

Continuous Assessment Grades 5, 6 & 7						
Components	Term 1		Term 2		Term 3	
	Number & Marks	Total	Number & Marks	Total	Number & Marks	Total
Practical Investigations	2 × 15	30	1 × 15	15	2 × 15	30
Projects			$(1 \times 30) \div 2$	15		
Topic Tasks	2 × 10	20	2 × 10	20	1 × 10	10
Topic Tests	$(2 \times 20) \div 2$	20	$(2 \times 20) \div 2$	20	$(1 \times 20) \div 2$	10
End-of-Term Test	1 × 30	30	1 × 30	30		
Term Marks		100		100		50
Weighted Term Marks for Report		100		100	50 × 2 =	100

10.5 End-of-year Examinations: Detailed Guidelines

In Grades 5-7 there will be internal end-of-year examinations. The purpose of these examinations is to focus on how well learners can demonstrate their thinking, communication and problem-solving skills related to the areas of the syllabus which are most essential for continuing in the next grade. Preparing for and conducting these examinations should not take up more than two weeks altogether right at the end of the year.

The end-of-year assessment for Grade 4 will be an end-of-year test of work done in the third term only. The end-of-year examination for Grade 5 should consist of work done in the second and third terms only, while the end-of-year examination for Grades 6 and 7 will consist of all work done during the whole year.

The description of various papers for the written examination is as follows:

Written Examination Grades 5, 6 and 7 and End-of-term 3 test for Grade 4			
Grade	Description of papers	Duration	Marks
4	This will consist of one paper based on work done in the third term only.	45 minutes	20
5	This will consist of one paper of 90 minutes consisting of two sections: Section A: 20 multiple choice questions (20 marks) Section B: variety of structured questions (50 marks)	90 minutes	70
6 and 7	This will consist of one paper of 90 minutes consisting of two sections: Section A: 20 multiple choice questions (20 marks) Section B: variety of structured questions (80 marks)	90 minutes	100

Promotion marks

A promotion mark will be awarded at the end of each year based on the average of the continuous assessment mark and the mark obtained in the examination. In Grade 4 continuous assessment contributes 80% and in Grade 5 continuous assessment contributes 65% of the summative mark. In Grades 6 and 7 continuous assessment contributes 50% of the summative mark.

The weighting of each assessment component is as follows:

Component for Grade 4	Description	Marks	Weighting
Written end-of-year test	Paper	20	20%
Continuous Assessment	Topic Tasks, Topic Tests, Practical Investigations/Projects, End of Term Test	80	80%
	TOTAL MARKS	100	100%

Component for Grade 5	Description	Marks	Weighting
Written Examination	Paper 1/Section A:	20	10%
	Paper 1/Section B:	50	25%
Continuous Assessment	Topic Tasks, Topic Tests, Practical Investigations/Projects, End of Term Test	65	65%
	TOTAL MARKS	135	100%

Component for Grades 6 and 7	Description	Marks	Weighting
Written Examination	Paper 1/Section A:	20	10%
	Paper 1/Section B:	80	40%
Continuous Assessment	Topic Tasks, Topic Tests, Practical Investigations/Projects, End of Term Test	50	50%
	TOTAL MARKS	150	100%

The promotion marks are calculated as follows:

Promotion Mark for Grade 4				
Total Term Mark	Term 1	Term 2	Term 3	180
	70	70	40	
CA Mark	(180 ÷ 18) x 8			80
End-of-term test in term 3	20 Mark			20
Promotion Mark	CA mark + End-of-year examination			100

Promotion Mark for Grade 5, 6 & 7				
Total Term Mark	Term 1	Term 2	Term 3	300
	100	100	100	
Grade 5				
CA Mark	(300 ÷ 30) x 13			130
End-of-year examination	70 Marks			70
Grade 6 & 7				
CA Mark	(300 ÷ 30) x 10			100
End-of-year examination	100 Marks			100
Promotion Mark	CA mark + End-of-year examination 200 ÷ 2			100

10.6 Specification Grids

The specification grids below indicate the mark weighting allocated to each objective for both continuous assessment and for the written examination.

1. Written Examination	Weighting %
Assessment objectives for written examination:	
Objective A Knowledge with Understanding	50
Objective B Handling Information, Application of Knowledge and Solving Problems	30
Objective C Practical (experimental and investigative) Skills and Abilities	20
Total	100
2. Continuous Assessment (CA)	Weighting %
Assessment objectives for continuous assessment:	
Objective A Knowledge with Understanding	20
Objective B Handling Information, Application of Knowledge and Solving Problems	30
Objective C Practical (experimental and investigative) Skills and Abilities	50
Total	100

11. Assessment Criteria

Notes on practical assessment of Objective C

It is recommended that a minimum of FIVE practical investigations be assessed and recorded (two investigations during the first, two during the second and one during the third trimester). One of the investigations during the second trimester should be a project or a practical investigation that will allow all major skills to be demonstrated by learners. The criteria for assessment of practical exercises are set below.

The general skills listed for Objective C: Practical (experimental and investigative) Skills and Abilities are related to the basic competencies considered most suitable for continuous assessment. Hence Objective C basic competencies are assessed mostly as part of CA.

Skill A: Practical Techniques

This skill includes experiments, handling and organising apparatus and materials, developing apparatus from readily available materials, following instructions to carry out an experiment, and showing due regard for safety in conducting experiments.

Skill B: Observing, Measuring and Recording

This includes writing down detailed quantitative and qualitative data, reading scales and tabulating results.

Skill C: Handling, Processing and Evaluating Data

This skill includes inferring conclusions from data, processing numerical data, drawing graphs and charts and dealing approximately with anomalous or inconsistent results.

Teachers could use the following 5-point scale when evaluating the performance tasks of Skill A.

Scale	General Criteria
5	The assessed skill is performed well above average, neatly and independently with little or no support or guidance
4	The assessed skill is performed above average with little or no support or guidance from the teacher
3	The assessed skill is performed at an average level; it is performed with some support or guidance from the teacher
2	The assessed skill is performed below average; it is performed with some support or guidance from the teacher
1	The assessed skill is performed well below average, requiring pronounced support or guidance from the teacher
0	This mark is only given when the learner is not assessed due to non-participation without valid reason*

* If a learner is absent or not participating with a valid reason, she/he should be given an opportunity to perform the involved skill or ability at a later stage.

12. Additional Information

Annexe 1: Terms used in teaching and assessment

WORD	MEANING
Analyse	Examine information in detail to discover patterns and relationships, or to study and determine relationship or accuracy
Apply/use	Emphasises the correct use of a equipments, procedures, rules or facts, e.g. a child may be able to use a Bunsen burner, but not do so correctly or does not have regard to safety
Calculate	A numerical answer is required - working must be shown
Classify	To arrange or organize according to systematic groups, classes, properties, characteristics or categories
Collect data/samples	Pose questions, select sources and/or design questionnaires. Physically collect samples
Compare / differentiate	To explain the resemblances, similarities or differences between two or more numbers, objects, or figures by considering their attributes/characteristics; or to determine if two or more items, entries or variables are the same and if not, identify differences and give a reason for the answer
Distinguish / identify	Tell apart, show or indicate the differences between, find out what is unique about a material or situation Example: Distinguish between heat and solar energy
Construct/draw/record	Make an accurate drawing, graphs, tables, charts or representation by using mathematical instruments and/or rules. In case of diagrams, make detailed drawing with heading and all relevant labels and in graph work or charts accurate to scale curves or lines should be given with a heading and relevant labels and units. In tables the heading and labels should be given. In tables the units should be given in the heading of the columns or with each entry but not both
Convert	Change from one unit of measure to another
Deduce	Use the information provided to come to a conclusion, e.g. reference to a law or principles, or the necessary reasoning is to be included in the answer
Define	A literal statement is required
Describe/observe	Write down what you do, or what you would see, hear, feel, smell and taste, in as much detail as possible with due regard to safety
Design	Make a plan or drawing to show the appearance of something before it is made
Determine	Use the information given to work out the answer – no working
Discrete data	Individually separate data, e.g. colour of cars – as opposed to continuous data, such as height
Discuss	Give a critical account of the points involved in the topic
Estimate	Implies a reasoned statement or calculation about something. Produce an approximate answer using rational, logical procedures (e.g. rounding for numbers and benchmarks for measures)

Evaluate	Use the information provided to make a judgement about something
Explain	Give a reason for your answer
Find	A general term which means calculate, determine or measure
Give/state/write down/express	Write down your answer
Interpret	Reasoning or some reference to theory, depending on the content Explain the meaning of something
Investigate	Examine a problem in a systematic way
List	Give a number of points, generally each of one word
Name	Identify by mentioning the name of something
Outline	Give a brief answer writing down the main points
Predict	To determine the next step or value (to make an educated guess), based on evidence or a pattern Make a logical deduction either from own knowledge or from the information given in the question or both
Recognise	Be aware of a fact or problem
Relate	Find the relationship between one or more variables
Select	Choose from a number of alternatives
Sketch	Make a rough drawing that shows the salient or distinguishing features of an object In diagrams, make a simple, freehand drawing and in graph work, the shape and/or position of the curve should be given
Study	Use the information or data provided to investigate a problem in a systematic way
Suggest	Use your knowledge of the context of the problem and mathematical procedures to give what you think is the best strategy to use or answer to the question Use your knowledge of science and the information in the question to give what you think is the best answer

Annexe 2: Assessment Record Sheet for Grade 4 (Term 1 and 2)

ASSESSMENT RECORD SHEET: NSHE															Grade:			Year:		
School:															Teacher:					
Name of Learner		Practical Investigation/ Project			Topic Task			Topic Test				End-of-Term Test	Term Mark	CA Mark	Exam mark	Weighted Term Mark				
		1	2	Total	1	2	Total	1	2		Total									
	Mark	10	10	20	10	10	20	10	10	20÷2	50	20	70	$(70 \div 7) \times 10 = 100$	100					
	1																			
	2																			
	Mark	10	10	20	10	10	20	10	10	20÷2	50	20	70	$(70 \div 7) \times 10 = 100$	100					
	1																			
	2																			
	Mark	10	10	20	10	10	20	10	10	20÷2	50	20	70	$(70 \div 7) \times 10 = 100$	100					
	1																			
	2																			
	Mark	10	10	20	10	10	20	10	10	20÷2	50	20	70	$(70 \div 7) \times 10 = 100$	100					
	1																			
	2																			
	Mark	10	10	20	10	10	20	10	10	20÷2	50	20	70	$(70 \div 7) \times 10 = 100$	100					
	1																			
	2																			
	Mark	10	10	20	10	10	20	10	10	20÷2	50	20	70	$(70 \div 7) \times 10 = 100$	100					
	1																			
	2																			

Annexe 4: Assessment Record Sheet for Grade 5

ASSESSMENT RECORD SHEET: NSHE													Grade:		Year:	
School:													Teacher:			
Name of Learner	Mark	Practical Investigation/ Project			Topic Task			Topic Test				End of Term Test	Term Mark	CA Mark	Exam mark	Promo tion Mark
		1	2	Total	1	2	Total	1	2		Total			130	70	100
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) (300÷30) x 13 = 130		100
	1															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	130	70	
	2															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) (300÷30) x 13 = 130		100
	1															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	130	70	
	2															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) (300÷30) x 13 = 130		100
	1															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	130	70	
	2															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) (300÷30) x 13 = 130		100
	1															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	130	70	
	2															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) (300÷30) x 13 = 130		100
	1															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	130	70	
	2															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) (300÷30) x 13 = 130		100
	1															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	130	70	
	2															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) (300÷30) x 13 = 130		100
	1															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	130	70	
	2															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) (300÷30) x 13 = 130		100
	1															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	130	70	
	2															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) (300÷30) x 13 = 130		100
	1															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	130	70	
	2															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) (300÷30) x 13 = 130		100
	1															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	130	70	
	2															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) (300÷30) x 13 = 130		100
	1															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	130	70	
	2															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) (300÷30) x 13 = 130		100
	1															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	130	70	
	2															

Annexe 5: Assessment Record Sheet for Grades 6 and 7

ASSESSMENT RECORD SHEET: NSHE													Grade:		Year:	
School:													Teacher:			
Name of Learner		Practical Investigation/ Project			Topic Task			Topic Test				End of Term Test	Term Mark	CA Mark	Exam mark	Promo tion Mark
		1	2	Total	1	2	Total	1	2		Total			100	100	100
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) 300÷3 = 100		100
	1															
	2															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	100	100	
	3															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) 300÷3 = 100		100
	1															
	2															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	100	100	
	3															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) 300÷3 = 100		100
	1															
	2															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	100	100	
	3															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) 300÷3 = 100		100
	1															
	2															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	100	100	
	3															
	Mark	15	15	30	10	10	20	20	20	40÷2	20	30	100	(T1+T2+T3) 300÷3 = 100		100
	1															
	2															
	Mark	15	15	30		10	10		20	20÷2	10		50x2	100	100	
	3															



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