



Examinations Council
of Eswatini

EPC

ESWATINI PRIMARY CERTIFICATE

Science

Syllabus

Subject Code: 513

For Examination In 2023 - 2024

CONTENTS

	Page
Introduction	3
Broad Aims	3
Assessment Objectives	5
Specification Grid	6
Scheme of Assessment	6
Curriculum Content	7
Glossary of Terms	15

INTRODUCTION

This syllabus is a revised version of the old Eswatini Primary Certificate Science Syllabus. This syllabus lays a foundation in science and is designed in such a way that learners hinge in well into the Junior Secondary Science, Senior Secondary Science syllabuses and any other equivalent course.

The Government's aspiration regarding Education for All (EFA) goal No. 6 is to "improve all aspects of the quality of education and ensure excellence so that recognised and measurable learning outcomes are achieved by all especially in literacy, numeracy and essential life skills. This goal is in line with the national aspiration that universal access to basic and pragmatic education will remain Eswatini's priority within available financial and the resource capacities. In ensuring quality and pragmatic Science education, this syllabus focuses on both Science and technology content as well as the development of skills. The syllabus is taught in a context – based approach to bring in the application of scientific concepts to reality and everyday life experiences of the learners.

The development of this Science syllabus for the primary Science level was guided by the National Education Policy 2018. This policy states that:

1. Science should have a place in the education of all learners who are in the school system, whether or not they are likely to go on to follow a career in Science or Technology field. Science and Technology permeate almost every aspect of daily life.
2. Science education should be regarded as a continuum from Grade 1 to 12. Courses of science education should form a coherent series of experiences for learners as they progress through the science curriculum.
3. The central objective of national policy for Science in secondary education (Junior and Senior) in Eswatini is that all learners should be given a broad programme of Science well suited for their abilities and aptitudes for the full five years of secondary education. Full attention must be given to the development of scientific skills and processes as well as to knowledge, understanding and attitude at the lower level.
4. The Science curriculum should be inclusive and provide genuine equality of opportunity and balanced courses. Particular attention should be given to the expectations and attitudes of the girl-child and special needs education aspects.

In addition, this policy envisages that after undertaking this course, learners should;

1. understand the natural and physical world, the process by which scientific concepts are developed and modified.
2. think critically and analytically integrate and synthesise knowledge and draw conclusions from complex material.
3. develop technical, mathematical and quantitative skills necessary for calculation, analysis and problem solving.

BROAD AIMS

This syllabus is designed to make learners:

- demonstrate an understanding of the relationship between their body and the environment
- explain the environmental changes that occur around them
- engage in informed interactions between the environment and themselves
- acquire scientific knowledge, science process skills, and develop attitudes which have immediate significance for the learners in terms of intrinsic interests and application to learners' individual lives as well as problem solving
- make learners appreciate, discover and develop life orientation skills to prepare them to be proactive citizens able to adapt to different real life situations.

The educational purposes for this syllabus are set out below.

At the end of the seven-year course the learners should:

- (a) understand, interpret and apply basic scientific concepts and principles
 - (b) be able to use scientific concepts to address social issues and maintain a healthy lifestyle in their environment
 - (c) have developed scientific skills, confidently apply them to solve problems and communicate scientific information with growing proficiency
 - (d) recognise and appreciate the importance of living in harmony with the environment by demonstrating the use of resources in a sustainable manner both individually and in the community
- (e) recognise the usefulness of science as a starting point for science-based careers.

ASSESSMENT OBJECTIVES

Assessment objectives in Science are:

- A** Knowledge and Comprehension
- B** Application of scientific information
- C** Investigative skills

A Knowledge and Comprehension

Learners should demonstrate knowledge and understanding of facts, concepts, phenomena, definitions, scientific vocabulary, technology, instruments and conventions including symbols, quantities and units.

B Application of Scientific Information

Using words or other written forms of presentation (i.e. symbols, graphs and numbers), learners should be able to:

- (a) locate, select, organize, and present information from different sources
- (b) identify patterns, report trends and draw conclusions from given information
- (c) translate information from one form to another
- (d) manipulate numerical and other data
- (e) give explanations for phenomena, patterns and relationships.

C Investigative Skills

Learners should be able to:

- (a) incorporate scientific attitudes in their investigative skills
- (b) formulate hypotheses and predictions
- (c) use techniques, apparatus and materials (including improvised equipment)
- (d) make and record observations, measurements and estimates
- (e) interpret and evaluate experimental observations and data
- (f) solve problems.

SPECIFICATION GRID

The different assessment objectives will be given the following approximate weighting in examination:

A	Knowledge and Comprehension	50%
B	Application of Scientific Information	30%
C	Investigative Skills	20%

SCHEME OF ASSESSMENT

All candidates will write two papers: Paper 1 and Paper 2.

Paper 1 (1 hour)

- (a) Will consist of 40 compulsory multiple-choice questions of the four-choice type covering every topic of the syllabus.
- (b) Will test mainly objectives **A** (Knowledge and Comprehension) and **B** (Application of scientific Information).

Paper 2 (1 hour 30 minutes)

- (a) Will consist of two sections with a total of 60 marks
- (b) Each question will carry 10 marks covering the different themes of the syllabus.

Section A will consist of 5 compulsory questions. These questions shall test objectives **A** and **B**.

Section B will consist of two questions from which candidates will choose one (1) question worth 10 marks. This section will test mainly objective **C**. The questions shall require familiarity with laboratory equipment and procedures and shall assume that the candidates have done hands-on practical activities.

CURRICULUM CONTENT

THEME	OBJECTIVES
	All learners should be able to:
A. LEARNING SCIENCE	<p>1.0 NATURE OF SCIENCE</p> <p>1.1 define Science as a way of knowing using observation and experimentation to describe and explain occurrences</p> <p>1.2 list some scientific processes through which they learn science i.e. observation, hypothesis/prediction, experimentation, and conclusion</p> <p>1.3 plan and conduct an investigation</p>
B. LIFE SCIENCE	<p>1.0 CHARACTERISTICS OF LIVING THINGS</p> <p>1.1 State all the characteristics of living things.</p> <p>2.0 CLASSIFICATION OF LIVING THINGS</p> <p>2.1 classify living things into animals and plants</p> <p>2.2 classify animals into vertebrates and invertebrates</p> <p>2.3 classify vertebrates into i.e. mammals, fish, birds, amphibians, reptiles</p> <p>2.4 state the characteristics of each class of vertebrates</p> <p>2.5 name arthropods as one of the classes of invertebrates</p> <p>2.6 state the main characteristics the following arthropods: insects, arachnids, crustaceans and myriapods, in terms of body parts, number of legs and body segmentation</p> <p>2.7 classify plants into flowering and non-flowering stating examples of each</p> <p>2.8 draw and label a dicotyledonous seed</p> <p>2.9 classify flowering plants according to type of seeds into monocotyledons and dicotyledons</p>
	<p>3. 0 PLANT PROCESSES</p> <p>3.1 identify and label the parts of a leaf i.e. midrib, veins, lamina/blade, apex, petiole/stalk</p> <p>3.2 classify leaves according to different types i.e. simple and compound</p> <p>3.3 define photosynthesis as the process through which plants manufacture/make their food using water and carbon dioxide in the presence of light and chlorophyll</p> <p>3.4 state the importance of leaves in photosynthesis</p> <p>3.5 investigate the importance of light and chlorophyll in photosynthesis</p> <p>3.6 identify parts of a plant that are involved in the absorption of water and dissolved nutrients</p> <p>3.7 state that nitrates are nutrients that are absorbed by plants from the soil</p> <p>3.8 describe the role of root hairs in the absorption of nutrients into the plant</p> <p>3.9 define transpiration as the loss of water from the leaves in the form of water vapour through the stomata</p> <p>3.10 state factors affecting the rate of transpiration i.e. environmental (e.g. sunny, cloudy and windy) and leaf structural features e.g. leaf size, shiny, thorny, hairy and thickness.</p>
	<p>4.0 REPRODUCTION IN LIVING THINGS</p> <p>4.1 (a) Reproduction in plants</p> <p>4.1.1 define reproduction as the process by which new organisms are produced from their parent or parents</p> <p>4.1.2 state the importance of reproduction</p> <p>4.1.3 differentiate between sexual and asexual reproduction</p> <p>4.1.4 identify and name the parts of a flower i.e. petals, sepals, flower stalk, anther, filament, stigma, style and ovary</p> <p>4.1.5 state the functions of the parts of a flower</p> <p>4.1.4 describe pollination and state agents of pollination i.e. wind and insects</p>

ESWATINI PRIMARY CERTIFICATE
SCIENCE SYLLABUS 2023-2024

	<p>4.1.7 explain fertilization in flowering plants 4.1.8 describe the importance of fertilization as formation of fruit and seed 4.1.9 define seed dispersal in terms of the spreading/scattering away of seeds from the parent plant 4.1.10 list the agents of seed dispersal 4.1.11 describe how seed/fruit are dispersed 4.1.12 explain the importance of seed/fruit dispersal 4.1.13 investigate conditions necessary for germination i.e. moisture, oxygen and suitable temperature</p> <p>4.2 (b) Reproduction in animals 4.2.1 describe reproduction in chickens, goats and toads 4.2.2 identify and label the parts of the human male reproductive system i.e. penis, prostate gland, scrotum, urethra, testes 4.2.3 state the functions of the labelled parts of the human male reproductive system 4.2.4 identify and label the parts of the human female reproductive system i.e. uterus, oviduct/fallopian tubes, vagina, cervix ovaries 4.2.5 state the functions of the labelled parts of the human female reproductive system 4.2.6 define sexually transmitted infections (STIs) as infections transmitted mainly through sexual intercourse 4.2.7 name the common STIs i.e. HIV/AIDS and gonorrhoea 4.2.8 describe the signs and symptoms of gonorrhoea 4.2.9 describe the basic facts about HIV/AIDS i.e. how HIV attacks and destroys the immune system, that people with HIV usually do not show any signs and symptoms but still spread the disease and that there is no cure yet for HIV/AIDS but there are life prolonging treatments) 4.2.10 describe the methods of transmission of HIV/AIDS i.e. blood contact, sexual intercourse with infected person and infected mother to child transmission 4.2.11 describe measures of prevention and control of HIV/AIDS i.e. abstinence and condoms 4.2.12 describe measures of prevention, treatment and control of gonorrhoea</p>
	<p>5.0 GROWTH IN ANIMALS 5.1 state the indicators of growth in animals e.g. body size, height 5.2 describe the different stages of growth in frogs and houseflies 5.3 list physical changes that occur in boys and girls during puberty</p>
	<p>6.0 NUTRITION IN ANIMALS 6.1 classify animals according to the type of food they eat i.e. herbivores, carnivores and omnivores 6.2 describe how the dentition of animals is adapted to their diet i.e herbivores, carnivores and omnivores</p>
	<p>7.0 RESPONSE/IRRITABILITY IN ANIMALS 7.1 define irritability in animals 7.2 investigate irritability in animals using the following stimuli: light, pain, heat and touch 7.3 explain the importance of irritability in animals i.e. protection and defense</p>
	<p>8.0 ECOLOGY 8.1 define ecology as the study of the relationship between living organisms and their natural environment 8.2 identify and describe food chains and food webs among living things in terms of producers, primary and secondary consumers 8.3 construct and describe a simple food chain and a food web</p>

ESWATINI PRIMARY CERTIFICATE
SCIENCE SYLLABUS 2023-2024

	<p>8.4 describe the flow of energy through living organisms in a food chain</p> <p>8.5 explain the balance in nature and its importance i.e. enough land for animals, enough producers (vegetation) for herbivores and enough primary consumers (herbivores) for secondary consumers (carnivores)</p> <p>8.6 describe the effect of pollution (air, water and land) on the balance of nature in the environment</p> <p>8.7 state that carbon dioxide is a greenhouse gas</p> <p>8.8 describe global warming resulting to climate change</p>
THEME	OBJECTIVES
	All learners should be able to:
C. PHYSICAL SCIENCE	<p>1.0 MATTER</p> <p>1.1 define matter as anything that occupies space and has mass</p> <p>1.2 state that all matter is made up of atoms which are the smallest particles of matter</p> <p>1.3 state that elements are made up of similar atoms</p> <p>1.4 list examples of elements i.e. copper, hydrogen, oxygen, iron, gold and silver</p> <p>1.5 State the three states of matter as solids, liquids and gases</p> <p>1.6 describe physical properties of matter in terms of volume, ability to flow and shape</p> <p>1.7 describe the process that happens when matter changes from one state to another i.e. melting, evaporation, condensation and freezing (particle arrangement not required)</p> <p>1.8 describe a mixture and state examples</p> <p>1.9 describe methods of separating mixtures i.e. sorting, using a magnet, decanting, evaporation, filtration and simple distillation.</p> <p>1.10 name substances obtained from the process of simple distillation i.e. (distillate and residue)</p> <p>1.11 define the terms solute, solvent and solution</p> <p>1.12 state examples of solvents, solutes and solutions</p> <p>1.13 state that substances dissolve to a certain limit in water</p>
	<p>2.0 PHYSICAL AND CHEMICAL CHANGES</p> <p>2.1 state the differences between physical and chemical changes</p> <p>2.2 identify physical changes from different activities</p> <p>2.3 identify chemical changes from different activities</p>
	<p>3.0 ACIDS AND ALKALIS</p> <p>3.1 state that an acid is a substance that turns blue litmus paper red</p> <p>3.2 state that an alkali is a substance that turns red litmus paper blue</p> <p>3.3 identify common acids, alkalis and neutral substances using indicators i.e. indicators prepared from plants, litmus papers and litmus solution</p> <p>3.4 identify common acids, alkalis and neutral substances using universal indicator solution and universal indicator paper</p> <p>3.5 name common acids and bases and their uses in everyday life e.g. soap, baking soda, cooking soda, tartaric acid, eno</p>

THEME	OBJECTIVES
	<p>All learners should be able to:</p> <p>4.0 MEASUREMENT</p> <p>4.1 state units for measuring time i.e. minutes, hours, seconds, days, weeks, months, years, decade, centuries, millennium</p> <p>4.2 measure time using clocks, watches and calendars</p> <p>4.3 calculate the area of regular and irregular objects</p> <p>4.4 define mass as the amount of matter in an object</p> <p>4.5 state the instruments and units for measuring mass</p> <p>4.6 measure the masses of different objects in grams and kilograms</p> <p>4.7 define volume as the amount of space occupied by an object</p> <p>4.8 state the units of volume</p> <p>4.9 calculate the volume of regular solids</p> <p>4.10 measure the volume of irregular objects</p> <p>4.11 measure the volume of liquids</p> <p>4.12 define density as the mass of a substance per unit volume</p> <p>4.13 state the instrument and unit for measuring density</p> <p>4.14 calculate the density of objects</p> <p>4.15 define temperature as the measure of how hot or cold a substance is</p> <p>4.16 identify and name the types of liquid-in-glass thermometers (clinical/medical and laboratory/ordinary thermometer) and unit, ($^{\circ}\text{C}$) for measuring temperature</p> <p>4.17 identify and name the parts of a thermometer</p> <p>4.18 state differences between the clinical and ordinary thermometers</p> <p>4.19 record temperature readings when cooling water, plot and draw a line graph</p> <p>4.20 interpret straight line graphs drawn from collected data</p>

ESWATINI PRIMARY CERTIFICATE
SCIENCE SYLLABUS 2023-2024

THEME	OBJECTIVES
	<p>All learners should be able to:</p> <p>5.0 ELECTRICITY</p> <p>5.1 describe the different forms of electricity i.e. static and current electricity</p> <p>5.2 investigate how it is possible for different objects to attract and repel each other due to their charges</p> <p>5.3 describe how an object can be charged by friction e.g. combs, pen, plastic straws</p> <p>5.4 describe the effects of charged objects on one another</p> <p>5.5 describe examples in everyday life where charging takes place by friction e.g. pulling of jersey, blankets and sheets apart</p> <p>5.6 state difference between static and current electricity</p> <p>5.7 identify a closed and an open circuit</p> <p>5.8 state that current will only flow in a closed circuit</p> <p>5.9 state the sources of current electricity</p> <p>5.10 construct a simple closed circuit using one cell</p>
	<p>6.0 MAGNETISM</p> <p>6.1 use a magnet to identify another magnet from other objects</p> <p>6.2 classify objects into magnetic and non-magnetic</p> <p>6.3 identify the different types of magnets i.e. cylindrical, bar and horseshoe magnets</p> <p>6.4 illustrate the magnetic field surrounding a bar magnet</p> <p>6.5 describe and make a simple electromagnet</p> <p>6.6 investigate the factors that affect the strength of an electromagnet (number of coils, number of cells)</p> <p>6.7 state the uses/applications of electromagnets</p>

ESWATINI PRIMARY CERTIFICATE
SCIENCE SYLLABUS 2023-2024

THEME	OBJECTIVES
	<p>All learners should be able to:</p> <p>7.0 ENERGY</p> <p>7.1 define energy as the ability to do work</p> <p>7.2 list common forms of energy (sound, heat, light, solar, electrical, potential, kinetic and chemical) and state their sources</p> <p>7.3 distinguish between kinetic and potential energy</p> <p>7.4 state examples of objects with kinetic and potential energy</p> <p>7.5 describe energy conversions e.g. heating water, drilling water with a wind mill, generating electricity using water and generating electricity from solar energy</p> <p>7.6 state the law of conservation of energy i.e. energy can neither be created nor destroyed</p> <p>7.7 describe renewable and non-renewable energy sources.</p> <p>7.8 describe wind as a form of a renewable energy source with reference to operating water pumps and generating electricity</p> <p>7.9 identify clean energy sources and sources that pollute the atmosphere</p> <p>7.10 describe ways of conserving electrical energy at home and at school</p>
	<p>8.0 LIGHT</p> <p>8.1 name common natural and artificial sources of light (sun, stars, electricity, candle, torch)</p> <p>8.2 explain the importance of light to plants and animals</p> <p>8.3 draw a ray and a beam of light</p> <p>8.4 demonstrate that light travels in a straight line</p> <p>8.5 demonstrate that light is made up of different colours</p>

ESWATINI PRIMARY CERTIFICATE
SCIENCE SYLLABUS 2023-2024

THEME	OBJECTIVES
	All learners should be able to:
D. EARTH SCIENCE	1.0 AIR 1.1 state that air is a mixture of gases 1.2 state the composition of air e.g. nitrogen – 78%, oxygen 21%, carbon dioxide – 0.03%, and other gases 1% 1.3 state the difference between inhaled and exhaled air 1.4 state and demonstrate that air supports combustion 1.5 describe the test for carbon dioxide using limewater 1.6 state the importance of the gases i.e. nitrogen – provision of nitrates to plants, carbon dioxide – fire extinguishers, oxygen – supports combustion
	2.0 LAND POLLUTION 2.1 describe pollution 2.2 state the causes of land pollution i.e. littering, over use of agricultural and industrial chemicals e.g. herbicide, pesticides 2.3 describe ways of reducing and preventing land pollution
	3.0 THE SOLAR SYSTEM 3.1 list the planets of the solar system i.e. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto 3.2 describe the planets that make up the solar system according to their distance from the Sun and their sizes

ESWATINI PRIMARY CERTIFICATE
SCIENCE SYLLABUS 2023-2024

THEME	OBJECTIVES
	All learners should be able to:
	<p>4.0 THE PLANET EARTH</p> <p>4.1 describe rotation of the earth in one day to explain the concept of day and night</p> <p>4.2 describe revolution of the earth</p> <p>4.3 state that the revolution of the earth leads to the four seasons of the year</p> <p>4.4 describe the link between seasons and the weather</p> <p>4.5 explain why objects fall to earth with reference to the existence of the Earth's gravitational pull</p> <p>4.6 explain why objects tend to float on the moon</p> <p>4.7 define weight as the force of gravity acting on a body</p> <p>4.8 state the differences between weight and mass</p>
	<p>5.0 PHASES OF THE MOON</p> <p>5.1 explain the importance of the moon</p> <p>5.2 identify and describe the phases of the moon</p> <p>5.3 state that the moon is non-luminous</p>
	<p>6.0 ECLIPSES</p> <p>6.1 describe the Solar eclipse</p> <p>6.2 describe the Lunar eclipse</p>
	<p>7.0 WEATHER FEATURES AND THEIR MEASUREMENT</p> <p>7.1 describe weather features and the instruments used in the measurement of:</p> <ul style="list-style-type: none"> • temperature (thermometer) • rain (rain gauge) • wind direction (wind vane) • wind speed (cup anemometer) <p>7.2 describe temperature as varying parameter over a period of time</p> <p>7.3 measure temperature of the atmosphere using a thermometer over a period of time</p> <p>7.4 describe some of the instruments e.g. rain gauge, cup anemometer and wind vane</p>

ESWATINI PRIMARY CERTIFICATE
SCIENCE SYLLABUS 2023-2024

THEME	OBJECTIVES
	All learners should be able to:
	8.0 CLOUDS AND WEATHER OBSERVATION 8.1 identify the four main types of clouds 8.2 describe how weather features affect peoples' lives i.e. positive effects and dangers of weather e.g. drought, floods, storms (thunderstorms, earthquakes, volcanic eruptions) 8.3 describe the processes that take place in the water cycle in terms of evaporation, transpiration, condensation, precipitation (rainfall)
	9.0 EFFECTS OF WEATHER TO LIVING THINGS 9.1 interpret weather reports 9.2 describe the effects of different weather conditions on plants and animals including man

THEME	OBJECTIVES
	All learners should be able to:
E. HEALTH AND THE HUMAN BODY	1.0 CELLS 1.1 define cells as building blocks of living things 1.2 state that cells can only be seen using a microscope 1.3 draw and label the structure of an animal and plant cells 1.4 state the structural differences between animal and plant cells 1.5 identify different types of cells i.e. white blood cells, red blood cells, root hair cell, leaf (palisade) cell
	2.0 NUTRITION 2.1 list the different types of nutrients needed in the body i.e. carbohydrates, proteins, fats, mineral salts (Calcium and iron) and vitamins (A, C) 2.2 classify food into the different nutrients groups 2.3 identify foods rich in the listed nutrients 2.4 state the functions of the following nutrients in one's diet, carbohydrates, proteins, fats and mineral salts (calcium and iron) and vitamin (A, C) 2.5 describe a balanced diet 2.6 identify indigenous food which can form a balanced diet 2.7 describe the results of poor nutrition in one's diet e.g. kwashiorkor, obesity, anorexia (slimming) and marasmus 2.8 identify recommended food for people with different conditions/illnesses i.e. diabetes, high blood pressure, heart problems, HIV/AIDS
	3.0 THE DIGESTIVE SYSTEM 3.1 define the term digestion as the breaking down of large insoluble food particles to small soluble particles that can be easily absorbed into the blood stream 3.2 state the importance of digestion 3.3 identify and name the parts of the human digestive system (alimentary canal) i.e. mouth, gullet, stomach, small intestines, liver, pancreas, large intestines, rectum and anus 3.4 state the functions of each of the parts of the alimentary canal 3.5 describe mechanical digestion in the mouth

ESWATINI PRIMARY CERTIFICATE
SCIENCE SYLLABUS 2023-2024

	<p>3.6 outline the route taken by digested food from the mouth to the end of the alimentary canal</p> <p>3.7 state the end products of digestion</p> <p>3.8 state what happens to food once it is digested</p>
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THEME	OBJECTIVES
	<p>All learners should be able to:</p>
	<p>4.0 CIRCULATORY SYSTEM</p> <p>4.1 identify and name the parts that make up the circulatory system i.e the blood, heart and blood vessels</p> <p>4.2 describe the functions of blood, heart and blood vessels</p> <p>4.3 label the four chambers of the heart</p> <p>4.4 identify and name the main types of blood vessels i.e. veins, arteries and capillaries</p> <p>4.5 list the substances transported in the circulatory system i.e. oxygen, carbon dioxide, dissolved nutrients and waste products (urea, excess salts, carbon dioxide)</p> <p>4.6 name components of blood i.e. white blood cell, red blood cells, plasma and platelets</p> <p>4.7 state the importance of white blood cells and red blood cells with reference to defense and transport respectively</p>
	<p>5.0 EXCRETION</p> <p>5.1 define excretion as the removal of waste products which are poisonous in the body</p> <p>5.2 identify the organs of excretion i.e. kidney, lungs and skin.</p> <p>5.3 state the functions of the excretory organs</p> <p>5.4 describe the importance of excretion in the body</p> <p>5.5 identify and label the structure of the urinary system i.e. kidney, ureter, bladder</p> <p>5.6 state the functions of the named parts of the urinary system</p> <p>5.7 describe breathing as exhaling (breathing out) and inhaling (breathing in)</p> <p>5.8 demonstrate how breathing takes place using a model</p> <p>5.9 identify and label the parts involved in breathing i.e. nose, windpipe, lungs, ribs, chest cavity, diaphragm, mouth and nasal cavity</p> <p>5.10 state the importance of breathing in relation to respiration</p>

ESWATINI PRIMARY CERTIFICATE
SCIENCE SYLLABUS 2023-2024

THEME	OBJECTIVES
	All learners should be able to:
	6.0 SKELETAL SYSTEM 6.1 identify the different parts of the human skeleton i.e. skull, vertebra, hip bone and ribs 6.2 state the function of the skeleton i.e. support, movement and protection 6.3 describe a joint (bones meet, cartilage, ligaments) 6.4 identify and name fixed and moveable joints i.e. skull – fixed joint; elbow, knee – moveable joints 6.5 describe the role of muscles in the movement of the arm with reference to opposing actions (relaxing and flexing) 6.6 describe injuries to joints, bones and muscles 6.7 describe ways of caring for the skeleton and muscles with reference to maintaining posture
F. TECHNOLOGY	1.0 TECHNOLOGY 1.1 describe technology
	2.0 TECHNOLOGY IN AGRICULTURE 2.1 explain how technological advancements have improved people’s lives in the agricultural sector 2.2 describe disadvantages of technological advancements in agriculture
	3.0 TECHNOLOGY IN HEALTH 3.1 explain how technology has improved people’s lives in the health sector 3.2 describe the disadvantages of technological advancements in health
THEME	OBJECTIVES
	All learners should be able to:
	4.0 TECHNOLOGY IN COMMUNICATION 4.1 identify technology used in communication such as cell phones, internet, WhatsApp, Facebook, twitter, zoom, google class, telephone, intercom 4.2 describe the advantages and disadvantages in the listed technology
	5.0 TECHNOLOGY IN ENTERTAINMENT 5.1 explain how technology contributes to entertainment 5.2 describe the advantages and disadvantages of technology in entertainment
	6.0 TECHNOLOGY APPLICATION FOR SAFETY 6.1 identify technology gadgets in ensuring safety at school and at home
	7.0 TECHNOLOGY ADVANCEMENTS 7.1 discuss issues relating to technology advancements applied to living things including organ transplants, cloning reproduction, cosmetic applications

GLOSSARY OF TERMS

It is hoped that the glossary will prove helpful to candidates as a guide i.e., it is neither exhaustive nor definitive. The glossary has been deliberately kept brief with respect to the number of terms included but also to the descriptions of their meanings. Candidates should appreciate that the meaning of a term must depend, in part, on its context.

In all questions, the number of marks allocated is shown on the examination paper, and should be used as a guide by candidates to how much detail to give or time to spend in answering. In describing a process the mark allocation should guide the candidate about how many steps to include. In explaining why something happens, it guides the candidate on how many reasons to give, or how much detail to give for each reason.

- CALCULATE** Used when a numerical answer is required. In general, working should be shown, especially where two or more steps are involved.
- DEDUCE** Used in a similar way to “Predict” except that some supporting statement is required (e.g., reference to a law, principle, or the necessary reasoning is to be included in the answer).
- DEFINE** (the term(s) ...) is intended literally, only a formal statement or equivalent paraphrase being required.
- DESCRIBE** Requires the candidate to state in words (using diagrams where appropriate) the main points of the topic. It is often used with reference either to particular phenomena or to particular experiments. In the former instance, the term usually implies that the answer should include reference to (visual) observations associated with the phenomena. In other contexts, describe should be interpreted more generally (i.e., the candidate has greater discretion about the nature and the organisation of the material to be included in the answer). “Describe and explain” may be coupled, as may “State and explain”.
- DETERMINE** Often implies that the quantity concerned cannot be measured directly but is obtained by calculation, substituting measured or known values of other quantities into a standard formula (e.g., resistance, the formula of an ionic compound).
- DISCUSS** Requires the candidate to give a critical account of the points involved in the topic.
- ESTIMATE** Implies a reasoned order of magnitude statement or calculation of the quantity concerned, making such simplifying assumptions as may be necessary about points of principle and about the values of quantities not otherwise included in the question.
- EXPLAIN** May imply reasoning or some reference to theory, depending on the context.
- FIND** Is a general term that may variously be interpreted as “Calculate”, “Measure”, “Determine”, etc.
- LIST** Requires a number of points, generally each of one word, with no elaboration. Where a given number of points is specified this should not be exceeded.
- MEASURE** Implies that the quantity concerned can be directly obtained from a suitable measuring instrument (e.g., length, using a rule, or mass, using a balance).
- OUTLINE** Implies brevity (i.e., restricting the answer to giving essentials).
- PREDICT** Implies that the candidate is not expected to produce the required answer by recall but by making a logical connection between other pieces of information. Such information may be wholly given in the question or may depend on answers extracted in an earlier part of the question. Predict also implies a concise answer with no supporting statement required.
- SKETCH** When applied to graph work, implies that the shape and/or position of the curve need only be qualitatively correct, **but** candidates should be aware that, depending on the context, some quantitative aspects may be looked for (e.g., passing through the origin,

having an intercept). In diagrams, sketch implies that simple, freehand drawing is acceptable; nevertheless, care should be taken over proportions and the clear exposition of important details.

STATE Implies a concise answer with little or no supporting argument (e.g., a numerical answer that can readily be obtained 'by inspection').

SUGGEST Used in two main contexts (i.e., either to imply that there is no unique answer (e.g., in Chemistry, two or more substances may satisfy the given conditions describing an 'unknown'), or to imply that candidates are expected to apply their general knowledge to a 'novel' situation, one that may be formally 'not in the syllabus').

WHAT DO YOU UNDERSTAND BY/WHAT IS MEANT BY: “What do you understand by”/ “What is meant by” (the term (s) ...) normally implies that a definition should be given, together with some relevant comment on the significance or context of the term(s) concerned, especially where two or more terms are included in the question. The amount of supplementary comment intended should be interpreted in the light of the indicated mark value.

PERFORM Perform an experiment in the syllabus implies that the learners will gain great benefit from carrying out such an experiment themselves, and as a result will be able to recall and explain the procedures and the associated science knowledge and understanding, demonstrate how to handle and interpret data from the experiment, and draw conclusions.

INVESTIGATE Investigate in the syllabus implies that the learners will have planned the experiment themselves before carrying it out, and as a result will be able to use hypotheses to make predictions and so explain the experimental plan, as well as the issues included above.

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