THE REPUBLIC OF UGANDA
Ministry of Education and Sports

ADVANCED SECONDARY CURRICULUM

BIOLOGY SYLLABUS

NCDC
NATIONAL CURRICULUM DEVELOPMENT CENTRE

2025

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DEVELOPMENT CENTRE

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FOREWORD

The Ministry of Education and Sports, through the National Curriculum Development Centre (NCDC), aligned the Advanced Level Curriculum with the competency-based Lower Secondary Curriculum (LSC) to ensure a smooth learner transition from lower secondary to advanced level.

The two-year aligned Advanced Secondary Curriculum adopted learner-centered approaches, inquiry-based, and discovery methods. The learning outcomes give the learner hands-on experiences in real-life situations while being cognizant of different learner abilities and learning styles. The syllabus focuses on assessment for learning with emphasis on criterion-referenced assessment. It further provides learners with the opportunity to enhance the 21st-century skills and values that were acquired at the lower secondary level.

This Biology syllabus promotes the acquisition of a deeper understanding of biological concepts, principles, and processes, as well as practical and investigative skills, to be applied in scientific reasoning and solving real-world problems about health, the environment, conservation, and technological advancements in Biology, for the wellbeing of individuals, plants, animals and society.

The curriculum promotes the acquisition of Higher-Order Thinking Skills (HOTS) such as inquiry, creativity and innovation, decision-making, critical thinking, and problem-solving. It calls for the use of learner-centred pedagogies with hands-on experience by the learners in real-life situations while acknowledging different learners' abilities and learning styles.

As the Minister responsible for education, I endorse this syllabus as the official document for teaching and learning Biology at the Advanced Level of secondary education in Uganda.

Hon. Janet Kataaha Museveni

First Lady and Minister of Education & Sports

ACKNOWLEDGMENTS

The National Curriculum Development Centre (NCDC) is indebted to the Government of Uganda for financing the alignment of the Advanced Level Curriculum to Lower Secondary Education in Uganda.

Our gratitude goes to the Ministry of Education and Sports for overseeing the adaptation of the curriculum, the Curriculum Task Force of the Ministry of Education and Sports for the oversight role and making timely decisions whenever necessary, and members of the public who made helpful contributions towards shaping this curriculum.

NCDC is also grateful to Members of Parliament, schools, universities, and other tertiary institutions, the writing panels, and professional bodies, for their input in the design and development of the Adapted A level curriculum. To all those who worked behind the scenes to finalise the adaptation process of this teaching syllabus, your efforts are invaluable.

NCDC takes responsibility for any shortcomings that might be identified in this publication and welcomes suggestions for effectively addressing the inadequacies. Such comments and suggestions may be communicated to NCDC through P. O Box 7002, Kampala, or Email: admin@ncdc.go.ug or on the Website: www.ncdc.go.ug

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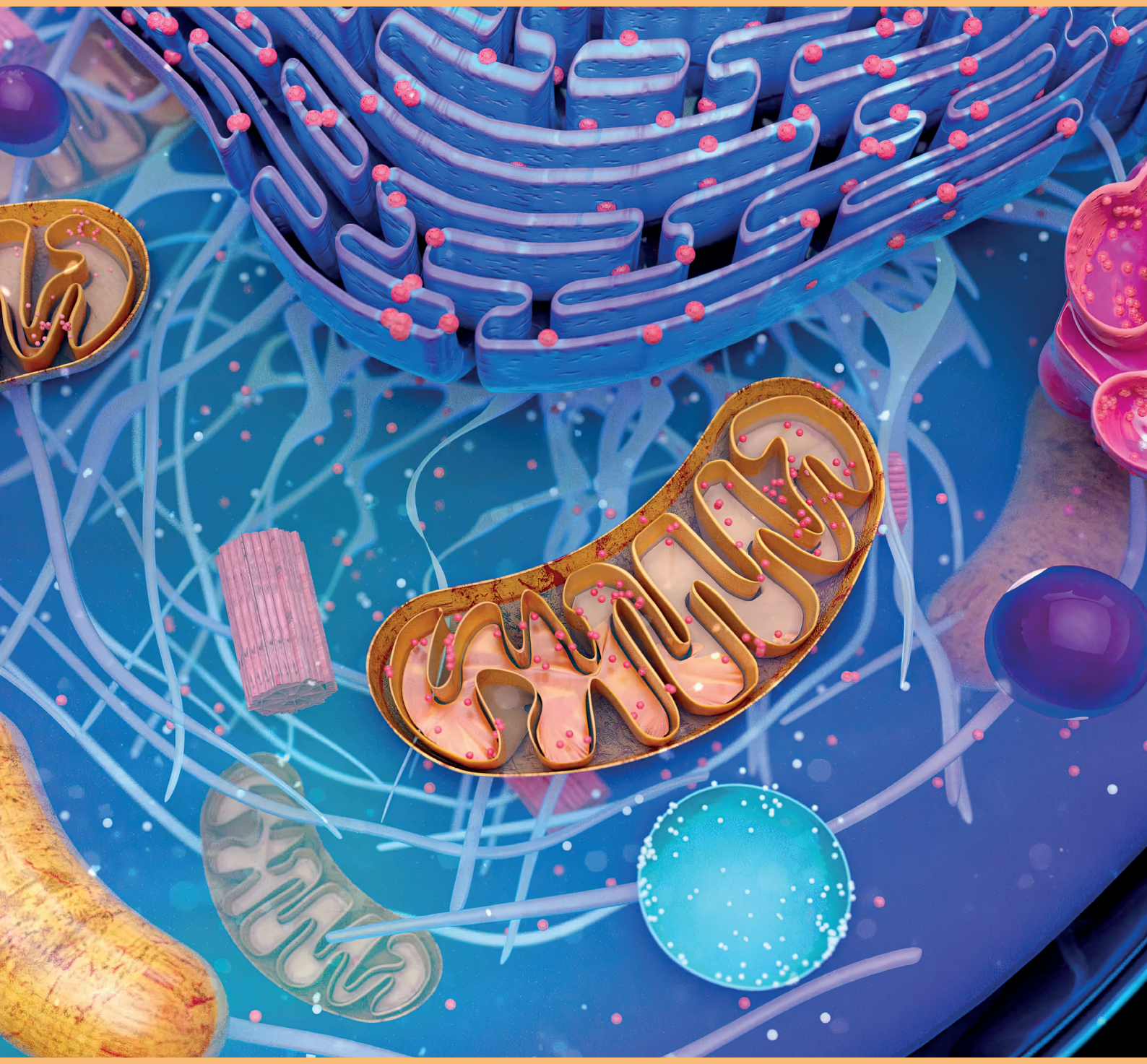

1.0 INTRODUCTION

The Advanced Secondary Curriculum has been aligned with the Lower Secondary competency-based model for ease of progression of learners from the Lower to Advanced Secondary Level. The alignment is a result of the analysis of the Advanced Level Curriculum published in 2013, to determine whether the content is:

i) appropriate.
ii) high-pitched or overloaded.
iii) covered at lower secondary.
iv) obsolete.
v) repeated in different topics and redundant.

The results from the curriculum analysis revealed that there were overlaps of concepts with what was covered at the Lower Secondary, as well as concepts within different topics of the same subject. In addition, a number of syllabuses had content that is no longer necessary for today's contemporary society and the 21st century.

1.1 Changes in the Curriculum

The alignment of the A -level Curriculum to that of the Lower Secondary led to changes in the pedagogies of learning from a knowledge- and objective-based, to an integrated and learner-centred competency-based approach. The Advanced Secondary Curriculum, therefore, is a result of rationalising, integrating, and merging content with overlaps and similar skills, dropping topics that had been studied at Lower Secondary, or are no longer critical and relevant for the current learning needs, while upgrading those that were of low competencies to match with the advanced level. The programme planner details the learning progression derived from the learning outcomes. The detailed syllabus section unfolds the learning experiences with corresponding assessment strategies.

This Biology syllabus is part of the Advanced Secondary Curriculum. The teacher is encouraged to read the whole syllabus before planning your teaching programme, since many topics have been merged, upgraded, or removed. While aligning this syllabus, efforts were made to ensure a smooth progression of concepts from the Lower Secondary Level, adapting topics and content with familiar features that are of value to the learner and society. In addition, the process of developing this syllabus document removed what was considered obsolete, high pitched as well as content overlaps and overloads.

1.2 Classroom-Based Assessment

This syllabus requires classroom learning to be experiential, through the suggested learning activities for the acquisition of the learning outcomes. This is the gist of a learner-centred and activity-based approach to learning, which emphasises the acquisition of required competencies. Formative assessment in Biology will focus on the acquisition of knowledge and skills, through performance of the learning activities. The learning activities sprout from the learning outcomes, which are evidenced by acquiring and demonstrating the application of the desired skills, to show that learning has taken place. The sample assessment strategies have been provided to guide the teacher on classroom-based assessment. The teacher can develop more assessment strategies based on the same principles of observation, conversation, and product, for the acquisition of the desired knowledge, skills, values, and attitudes. (See detailed syllabus)

1.3 Learners with Special Education Needs

The Advanced Secondary Curriculum is designed to empower all learners, including those with Special Educational Needs (SEN), to reach their full potential and contribute meaningfully to the nation. By incorporating inclusive strategies, the curriculum ensures equitable access to high-quality learning opportunities, while maintaining high academic standards. It emphasises creating an inclusive learning environment that supports the diverse needs of learners with SEN, enabling them to succeed alongside their peers

1.4 Generic Skills

Generic skills are embedded within all subjects and are essential for learning and workforce readiness. These skills enable learners to engage with the entire curriculum effectively and prepare them for lifelong learning. These skills equip learners with the ability to adapt to change and navigate life's challenges in the 21st century.

The key generic skills include:

1

Critical thinking and problem-solving

i) Planning and carrying out investigations
ii) Sorting and analysing information
iii) Identifying problems and proposing solutions
iv) Predicting outcomes and making reasoned decisions
v) Evaluating different solutions

2

Co-operation and Self-Directed Learning

i) Working effectively in diverse teams
ii) Interacting effectively with others
iii) Taking responsibility for own learning
iv) Working independently with persistence
v) Managing goals and time

3

Creativity and Innovation

i) Using imaginations to explore possibilities
ii) Working with others to generate ideas
iii) Suggesting and developing new solutions
iv) Experimenting with innovative alternatives
v) Looking for patterns and making generalisation

4

Communication

i) Listening attentively and with comprehension
ii) Talking confidently and explaining ideas/opinions clearly
iii) Reading accurately and fluently
iv) Writing and presenting information coherently
v) Using a range of media to communicate ideas

5

Mathematical Computation

i) Using numbers and measurements accurately
ii) Interpreting and interrogating mathematical data
iii) Using mathematics to justify and support decisions

6

Information and Communication Technology (ICT) Proficiency

i) Using technology to create, manipulate and process information
ii) Using technology to collaborate, communicate and refine work

7

Diversity and Multicultural Skills

i) Appreciate cultural diversity
ii) Respectfully responding to people of all cultures
iii) Respecting positive cultural practices
iv) Appreciating ethnicity as a cradle for creativity and innovation

1.5 Cross-cutting Issues

These are issues that young people need to learn about, and are not confined to a particular subject but are studied across subjects. They help learners develop an understanding of the connections between the subjects and the complexities of life as a whole. They are:

i) Environmental awareness
ii) Health awareness
iii) Life skills
iv) Mixed abilities and involvement
v) Socio-economic challenges
vi) Citizenship and patriotism

These are a concern to all mankind, irrespective of their areas of specialty. They are infused with the different learning outcomes of the different subjects.

1.6 Values

The curriculum is based on a clear set of values derived from the Uganda National Ethics and Values Policy of 2013. These values underpin the whole curriculum and the work of schools, so learners need to exhibit them in their way of life as citizens of Uganda. They are:

i) Respect for humanity and the environment
ii) Honesty, uphold and defend the truth at all times
iii) Justice and fairness in dealing with others
iv) Hard work for self-reliance
v) Integrity; moral uprightness and sound character
vi) Creativity and innovation
vii) Social responsibility
viii) Social harmony
ix) National unity
x) National consciousness and patriotism

Values are not taught directly in lessons, nor are they assessed by pen and paper. However, they are incorporated into some learning outcomes and are developed as learners progress.

1.7 ICT Integration

The integration of ICTs into teaching and learning is strongly encouraged in this Advanced Secondary Curriculum. ICT enhances the implementation of competency-based learning by fostering learner engagement, creativity, and lifelong learning. Teachers are encouraged to use technology to create interactive content, such as digital simulations and videos, to illustrate abstract or complex concepts effectively. Integrating ICT not only enhances the learning experience but also equips learners with essential digital skills for the 21st century.

ICT teachers should endeavour to assist other subject teachers in making the ICT integration process a reality. The table below shows a sample of suggested ICT tools that may be applied to given tasks.

Sample Task in the Syllabus	Suggested ICT Tool
Fieldwork	Use of cameras to take photos and record videos
Locate places on a map	Use digital maps such as Google Maps or an equivalent application.
Presentation in class	Use presentation applications or online presentation tools like Canva
Search for keywords and meanings	Use an online dictionary or search online
Make drawing/graphics	Use drawing tools like Draw.io or publishing software/Word processor
Roleplay, narrations	Use audio and video recordings
Demonstrations	Use audio/video recordings, models, simulations, or virtual labs
Analyse and present data	Use spreadsheet software or any other analytics tools
Group discussions	Mind mapping software
Search for extra reading materials	Download files from the Internet from academic Databases
Writing equations and formulae	Use equation editors like MathType
Carry out academic search/research	Use the Internet, AI models, and other academic applications like "Encarta", "Britannica", etc.
Collaborate with others across the world	Form learning networks with blogs, social media, emails, and videoconferencing tools like Zoom, MS Teams, Webex, Google Meet or any other networking application.

1.8 Projects

Projects and project-based learning are part and parcel of learning in the 21st century. Project-based learning as a hands-on approach is vital in promoting active and experiential learning and enhancing creativity and innovation among learners, as well as catering to interdisciplinary learning. Learners will be required to identify real-world problems carry out scientific investigations to find practical solutions or products, and write scientific reports. Learners will be encouraged to select projects that are relevant, engaging, and aligned with the different topics in the syllabus

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1.9 The Aims of Secondary Education

The aims of secondary education in Uganda are to:

i) Instil and promote national unity, an understanding of social and civic responsibilities, strong love and care for others, and respect for public property, as well as an appreciation of international relations and beneficial international cooperation.

ii) Promote an appreciation and understanding of the cultural heritage of Uganda, including its languages.

iii) Impart and promote a sense of self-discipline, ethical and spiritual values, personal and collective responsibility, and initiative.

iv) Enable individuals to acquire and develop knowledge and an understanding of the emerging needs of society and the economy.

v) Provide up-to-date and comprehensive knowledge in theoretical and practical aspects of innovative production, modern management methods in the field of commerce and industry, and their application in the context of the socio-economic development of Uganda.

vi) Enable individuals to develop basic scientific, technological, technical, agricultural, and commercial skills required for self-employment.

vii) Enable individuals to develop personal skills of problem-solving, information gathering and interpretation, independent reading and writing, and self-improvement through learning and development of social, physical, and leadership skills such as are obtained through games, sports, societies, and clubs.

viii) Lay a foundation for further education.

ix) Enable the individual to apply acquired skills in solving problems of the community, and to develop a strong sense of constructive and beneficial belonging to that community.

x) Instil positive attitudes towards productive work and strong respect for the dignity of labour and those who engage in productive labour activities.

xi) Develop a positive attitude towards learning as a lifelong process.

1.10 Aims of the Advanced Secondary Curriculum

The aims of the A level curriculum are to:

i) adopt a competency-based learning approach.
ii) develop holistic education for personal and national development, based on clear shared values.
iii) develop key skills that are essential to work and life and promote life-long learning.
iv) adopt an integrated approach to learning that develops the ability of learners to apply learning.

v) improve on assessments by incorporating school-based assessment into end-of-cycle assessment.
vi) emphasise learners' participation through engagement with the community.
vii) prepare for further education.

1.11 Rationale for Teaching Biology at A Level

The advanced-level Biology curriculum aims to enable learners to:

i) apply biological concepts and principles to find practical solutions to day-to-day life individual and societal challenges.
ii) communicate or disseminate accurate biological facts.
iii) develop the ability to design and carry out scientific investigations, interpret data, acquire analytical skills, and write logical, precise, and clear reports.
iv) innovatively use available resources, including ICT, local materials, and facilities, to research, carry out project work, and obtain information, to address societal needs.
v) develop an interest in exploring the ethical, social, and environmental implications of biological advancements

1.12 Subject Overview

The areas of study in Biology have been re-organised and designed into broad categories that include health awareness, environment awareness/conservation, and care for self and other living organisms. The subject emphasizes hands-on learning, creativity, innovation, and real-life application, enabling learners to gain competencies that can be applied both within and beyond the classroom setting. The advanced-level Biology emphasizes the development of strong scientific inquiry skills where learners will engage in investigations, making precise and accurate observations and measurements of biological phenomena. They will learn to record these observations methodically, analyse data critically, and present findings clearly and concisely using appropriate scientific formats.

1.13 Time Allocation

The learners shall be engaged for nine (9) periods of 40 minutes per week from senior five to senior six. The total number of periods to be spent on each topic is stated in the syllabus.

1.14 Suggested Approaches to Teaching and Learning Biology

The suggested approaches enhance learning by empowering teachers to support learners so that they acquire the planned competencies. This necessitates teachers to work alongside learners to guide, support, and supervise them as they progress through the learning process. These approaches include:

i) Inquiry-based learning: Learners explore biological phenomena through research in the form of investigations and experiments. This helps to develop investigative and critical-thinking skills and encourages active learning.

ii) Experiential learning: Learners engage in hands-on experiments and/ or field trips to collect data and explore biological concepts. This fosters reflection and builds transferable skills that are applicable beyond school.

iii) Problem and project-based learning: Learners design scientific investigations to solve real-world problems. This encourages self-directed learning and builds real-world skills.

1.15 Programme Planner

Senior Five and Six

Class	Topic	Sub-topics	Periods
Senior Five Term 1	1. Cell Biology	Chemicals of Life	90
		Microscopy	
		Ultrastructure of Plant, Animal, and Bacterial Cells	
		Diversity of Tissues	
Senior Five Term 2	2. Nutrition in Plants	Photosynthesis in C_3 and C_4 Plants	28
	3. Transport in Humans	Transport of Gases in Humans	80
		Immunity in Humans	
Senior Five Term 3	4. Respiration	Mitochondrion Structure and Function	30
		ATP Production Processes	
	5. Homoeostasis	Negative Feedback Mechanisms	78
		Osmoregulation	
Senior Six Term 1	6. Coordination	Plant Hormones and Responses	90
		Impulse Transmission	
		Sensory Receptors	
		Behaviour	
Senior Six Term 2	7. Inheritance and Evolution	Nucleic Acids Structure and Function	18
		Gene Technology	72
		Mendelian and Non-Mendelian Inheritance	
		Evolutionary Advancements in Life Process in Animals	
		Speciation and Extinction	
	8. Growth in Plants and Development in Insects	Growth in Plants	36
		Metamorphosis in Insects	

Senior Six Term 3	9. Ecology	Population Ecology	90
		Succession and Ecological Restoration	
		Energy Flow in the Ecosystem	
		Concept of Carbon Footprint	
		Invasive Species	
		Food Security	

1.16 Note to users

Each topic has a competency, which is a broad statement that brings out what the learner is expected to do at the end of the topic. The competency is further broken down into learning outcomes, for which suggested learning activities and sample assessment strategies are developed as seen in the three columns below.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
A statement of the knowledge, understanding, skills, generic skills, values, and attitudes expected to be learned by the end of the topic. Hence each learning outcome is coded with some of these as k, u, s, gs, and v/a for emphasis to the teacher on what to consider during the lesson.	The sort of hands and minds on engagements, enable the learner to achieve the learning outcome including the generic skills and values. They are designed to enable learners to Discover, Explain, Apply, and Analyse (DEAA) as they participate in knowledge construction.	Opportunities for assessment within the learning process that is, during and after the lesson.

The learning activities and assessment strategies in the syllabus are "suggested" and "samples" respectively and not exhaustive. Teachers are encouraged to develop more learning activities and assessment strategies that are based on the learning outcomes. In addition, teachers are free to customise the suggested learning activities to make them suitable for their respective learning environments and for learners with special educational needs.

2.0 DETAILED SYLLABUS

SENIOR FIVE TERM 1

TOPIC 1: Cell Biology

Duration: 90 Periods

Competency: The learner evaluates cells and tissues, by analysing and relating their structure to function, as a basis for medical research in order to improve health.

Learning Outcomes The learner should be able to:	**Suggested Learning Activities**	**Sample Assessment Strategy**
a) analyse the properties and functions of chemical compounds (water, lipids, proteins including enzymes from mammals) in a cell, focusing on their roles in maintaining cellular structure and metabolic processes in living organisms. (s, gs) *(Thermal properties of water not required.)*	a) In groups, learners search for and discuss: i) interaction of water with polar and non-polar substances. ii) simple and conjugated lipids, their properties, and functions. iii) structural categories of proteins, their properties, and functions. Create audio-visual presentations and share them with other groups. b) Using modelling or dramatisation, learners discuss: i) the mechanisms of enzyme action. (Lock and key, induced fit hypothesis) ii) the different types of enzyme inhibition. Make a write-up and present it to the class in a plenary. c) In groups, learners dissect a small mammal and extract structures that contain enzymes. Design and carry out scientific investigations on enzyme substrate specificity, effects of inhibitors, substrate, and enzyme concentrations on enzyme-controlled reactions, and write a scientific report.	a) Observe the learners' ability to: i) sort and analyse information during the discussion. ii) work effectively in diverse teams when carrying out scientific investigations b. Use probing questions to find out the learners' ability to: i) relate the properties of the chemical compounds to their functions. ii) explain the commercial application of enzyme inhibition. b) Assess the learner's: i) presentation/ write-up for correct science facts. ii) scientific reports for coherence in all the sections (title, aim, hypothesis, methods, results, and discussion).

b) operate a light microscope to observe tissues from plants and animals under different magnifications. (s, gs)	In pairs, learners prepare slides, observe under low and medium power, and determine the linear magnification of the cells observed. Make a write-up and present findings to the class in a plenary.	a) Observe the learner's ability to: i) prepare slides and use a microscope. ii) measure the field of view and estimate cell size. b) Use probing questions to find out the learners' ability to use a microscope to obtain results. c) Assess the learner's write-up for correct calculation of linear magnification.
c) analyse the ultrastructure of animal/ plant cells, bacterial cells, and the plasma membrane, to distinguish prokaryotic and eukaryotic cell characteristics. (s, gs)	a) In groups learners: i) study and compare images of ultra-structures of animal or plant cells with a bacterium cell, and make diagrams using a suitable graphics program. ii) study images of the fluid-mosaic model of the plasma membrane, make a model and use it to explain the functions of the membrane and its parts. Make a write-up and present the findings to the class. b) Learners search and categorise the cells as prokaryotic and eukaryotic and present their work to the rest of the groups. c) Learners search for the differences in the ultrastructure of prokaryotes, design an annotated flow diagram, and use it to explain the division of the original kingdom Monera to kingdoms eubacteria and archaebacteria.	a. Observe learners' ability to: i) use the model to show the parts of plasma membrane and state their function. ii) use imagination to come up with unique models. b. Probe learner's to: i) identify the key differences in the structures of the cells. ii) explain the fluid-mosaic nature of the membrane. iii) mention the non-structural differences between eubacteria and archaebacteria. c. Assess if the: i) categories formed show clarity and correctness of the differences between the cells. ii) models depict the structure and functionality of the plasma membrane.

d) analyse the structures of plant (parenchyma, collenchyma, sclerenchyma, xylem, and phloem) and animal (epithelial, cardiac, areolar, fibrous, and skeletal) tissues to assess their roles in physiological processes, disease diagnosis, and levels of organisation. (u, s, v/a, gs).	a) In groups learners: i) observe and discuss micrographs, images, prepared slides, or prepared slides of plant tissues, epithelial tissues, and connective tissues. ii) relate the structure and location of the tissues to their functions. Make a write-up with labelled drawings and present it to the class. b) In pairs, learners conduct an investigation to compare micrographs of healthy tissues from the internal organs (liver, lungs, heart, or intestines) of a mammal, with images of micrographs of diseased tissues from the same organs. Make a report and present the findings to the class. c) Learners hold a debate titled "Organisms at the organ level are more efficient than those at the cellular and tissue level".	a) Observe the learners' ability to: i) analyse the structure and arrangement of cells in each tissue. ii) dissect and extract sample tissues from a rat. iii) identify the advantages of each level of organisation. b) Use probing questions to find out the learner's ability to: i) justify the unique features and location of the tissues. ii) distinguish features of the extracted tissue from the diseased one. iii) defend their views in a debate. c) Assess the drawings if they depict the features of the different tissues.

SENIOR FIVE TERM 2

TOPIC 2: Nutrition in Plants

Duration: 28 Periods

Competency: The learner evaluates the nutritional strategies of carbon three (C3) and carbon four (C4) plants by analysing their photosynthetic pathways and adaptation to environmental conditions so as to optimise agricultural productivity and food security under varying climatic conditions.

Learning Outcomes The learner should be able to:	**Suggested Learning Activities**	**Sample Assessment Strategy**
a) evaluate the relationship between the structure of chloroplast and photosynthesis in C3 and C4 plants (u, s, gs) *(Details of biochemistry are not required.)*	a) In groups, learners study images/tactile diagrams of the ultrastructure of a chloroplast, make a model, and use it to explain the functions of the parts. b) Using role play, learners in their groups demonstrate the light-dependent and independent stages of photosynthesis in C3 and C4 plants. c) In groups, learners search and discuss the specific pathways involved in the synthesis of proteins and lipids, using intermediates (ATP, NADPH, G3P) of reactions of photosynthesis. Using computer-generated infographics, learners present their findings to the rest of the class.	a) Observe the learners' ability to: i) work effectively in diverse teams during discussion and roleplay. ii) use technology to communicate and refine their presentations. b) Use probing questions to find out the learners' understanding of: i) how the parts of the chloroplast suit their functions. ii) the advantages of C4 over C3 plants. iii) how plants form different products of photosynthesis. c) Assess the learner's presentations for the correct sequence of events in the processes.

b) assess the influence of environmental factors on the photosynthetic efficiency of plants to optmise photosynthetic rates and crop yields. (u, s, gs, v/a)	a. In groups, learners use project-based learning to design, build, and operate a mini-greenhouse. b. In pairs, learners carry out scientific investigations on the behaviour of guard cells under varying sucrose concentrations. i) Learners write a report including relevant drawings. ii) Learners use their findings to explain the photosynthetic theory for the opening and closure of stomata. c. In pairs, learners analyse data on the distribution and abundance of C3 and C4 plants at different altitudes, temperatures, and oxygen concentrations Using a presentation program, each pair presents their report and explanations in a class plenary session.	a. Observe the learners' ability to: i) collaborate during the selection of suitable materials for the greenhouse. ii) Interrogate and interpret data on photosynthesis. b. Use probing questions to find out the learners': i) ability to explain the effect of water stress on the rate of photosynthesis. ii) the effect of light (intermittent and continuous) on the rate of photosynthesis. iii) ability to explain the relationship between varying sucrose concentration with stomatal opening/closing. iv) understanding of the efficiency of PEP carboxylase versus Rubisco. c. Assess the learner's reports for the application of greenhouse technologies and the accuracy of the scientific report.

TOPIC 3: Transport in Humans

Duration: 80 Periods

Competency: The learner appreciates the mechanisms of transport of substances in the blood, and the immune system's role in protecting the human body by analysing the processes and their role in the maintenance of human health, to prevent diseases in everyday life.

Learning Outcomes The learner should be able to:	**Suggested Learning Activities**	**Sample Assessment Strategy**
a) assess the role of the human heart in blood circulation and the role of haemoglobin in the transportation of gases in blood under various physiological conditions. (u, s, gs, v/a)	a) In groups, learners search for: i) the transportation of oxygen and carbon dioxide in the body. ii) effect of different factors on the amount of oxygen in the blood. iii) the effect of carbon dioxide concentration on the heartbeat rate. iv) the responses of athletes versus non-athletes, and low-land dwellers versus high-land dwellers, to exercise. Learners discuss, create audio-visual presentations, and share with other groups. b) In groups, learners are provided with case studies on carbon monoxide poisoning. They analyse to find out the problems and causes and propose strategies to prevent/manage the challenges. Learners make a write-up and present their findings to the other groups. c) In groups, learners watch/listen to video clips/ animations or search on the myogenic action of the heart and nervous control of heartbeat rate. Learners discuss and make illustrations, present their work, and critique the group findings.	a) Observe the learners' ability to: i) share tasks and ideas. ii) create and use visual aids to illustrate their findings. b) Use probing questions to find out the learners': i) understanding of the importance of chloride shift in carbon dioxide transportation. ii) understanding of oxygen dissociation in the respiring tissue. iii) ability to explain the effect of carbon monoxide on transportation of oxygen. iv) understanding of the role played by the brain, sinoatrial node, and atrioventricular node during regulation of the heartbeat. c) Assess the visual aids for the correct representation of the concepts of transport of gases.

b) analyse the role of antibodies in vaccination and allergic reactions in relation to human body immunity. (u, s, gs, v/a)	a) Learners search for and discuss: i) types of immunity (innate and adaptive). ii) the concept of vaccination. iii) role of histamine in allergy. iv) new-born haemolytic disease. In groups, learners make write-ups and present their work to the class plenary. b) Learners search for the structure and action of antibodies, discuss and i) design antibody models, and create visual presentations to share with other groups. ii) Search for the mechanism used in rapid test kits to detect infections. In groups, learners make write-ups and present their work to the class plenary.	a) Observe the learners' ability to: i) work effectively in diverse teams. ii) sort and analyse. iii) information about vaccination. iv) use models to represent the structure of the antibody. b) Use probing questions to find out the learners': i) understanding of non-specific and specific body defence mechanisms. ii) ability to explain the action of antibodies. iii) ability to describe the effects of histamine. iv) understanding of the effect of Rhesus compatibility of couples on the baby. Assess the clarity of learner's models, and visual presentations for the right sequence of events that occur during body defense and report for correctness of information.

SENIOR FIVE TERM 3

TOPIC 4: Respiration

Duration: 30 Periods

Competency: The learner appreciates how living organisms generate cellular energy, by analysing respiratory processes and the chemical breakdown of food within cells, to make informed decisions that promote good health and wellbeing.

Learning Outcomes The learner should be able to:	**Suggested Learning Activities**	**Sample Assessment Strategy**
a) examine the relationship between the structure of the mitochondrion and the stages of cellular respiration in living organisms. (u, s)	a) In groups, learners study images of the ultrastructure of a mitochondrion, make drawings, and share them in a class plenary. b) Learners individually search for and discuss the structural relationship of the mitochondrion to its functions and hydrolysis of Adenosine triphosphate (ATP) to release energy. Using concept mapping, learners present their work in a class plenary.	a) Observe the learners' ability to: i) listen, and equally contribute to the discussions. ii) Sort and analyse information related to the structures in a mitochondrion and their functions. b) Use probing questions to find out the learners' understanding of: i) the detailed structure. ii) energy release from ATP. c) Assess the learners' concept map for the correct relationship between structure and function.
b) analyse the biochemical processes leading to ATP production in living organisms, and how these processes are affected by physical activities and respiratory poisons (cyanide). (u, s, gs, v/a). *(Details of biochemistry are not required)*	a) In groups, learners use simulations that demonstrate the process of glycolysis, focusing on its stages, key molecules involved, and its significance in cellular respiration. Make a write-up and present it to the class plenary. b) Using the jigsaw strategy, learners discuss the role of acetyl coenzyme A (acetyl-CoA) in the metabolism of carbohydrates, lipids, and proteins.	a) Observe the learners' ability to: i) listen, equally contribute to the discussions, and build on each other's ideas. ii) use visual or physical items to represent the sequence of reactions and the role of key molecules. b) Use probing questions to find out the learners' understanding of: i) key steps involved in the sugar breakdown in the cytoplasm. ii) the central role of acetyl-CoA in metabolism.

	Each group creates a summary chart showing the integration of these pathways through acetyl-CoA and presents it to the class. c) In groups, learners search for the citric acid cycle, focusing on key steps (substrate-level phosphorylation, decarboxylation, and the production of NADH and $FADH_2$). Groups then engage in a hands-on activity, such as constructing a flowchart, to visualise the cycle and present it in class. d) In groups, learners search for oxidative phosphorylation in the mitochondrion. Learners watch a video clip or role-play the events of electron transport focusing on the role of protein complexes, NADH, $FADH_2$, and oxygen. Make a write-up and present. e) Learners search for or watch an animation explaining how cyanide disrupts the electron transport system. They then pair up to share and present their findings. f) In groups, learners search for how ATP production changes during various exercise intensities. Learners make write-ups and use gallery walks to discuss their findings.	iii) the fate of Acetyl-CoA, NAD, and FAD. iv) cyanide effect on the electron transport system. v) the exercise intensity on ATP production. c) Assess learners' presentations for the correct sequence of events.

TOPIC 5: Homeostasis

Duration: 78 Periods

Competency: The learner evaluates the regulation and maintenance of optimal internal environment in living organisms by analysing how organ systems generate and eliminate metabolic wastes and maintain the functioning of cells, to make life choices that promote wellness.

Learning Outcomes The learner should be able to:	**Suggested Learning Activities**	**Sample Assessment Strategy**
a) analyse the homeostatic control system, focusing on the role of negative feedback mechanisms in maintaining internal stability. (u, s, gs)	a) In groups, learners search for i) the significance of maintaining a stable internal environment. ii) components of an efficient homeostatic system. Make a write-up and share their findings with the class. b) In groups, learners use mind maps to: i) illustrate the physiological and behavioural adaptations of endotherms to survive in varying temperature conditions. ii) illustrate the role of the hypothalamus and skin in regulating temperature in endotherms. Groups present their mind maps to the rest of the class through a gallery walk. c) In groups, learners describe how ADH works to maintain water balance in the body. Make a write-up and present it in a class plenary. d) Using Socratic circles, learners analyse and discuss animal adaptations to different water availability in their environment. Make a write-up and present it in a class plenary.	a) Observe the learners' ability to: i) share information about how a homeostatic system works. ii) work together as they create visual illustrations. b) Use probing questions to find out the learner's understanding of: i) the effect of varying the internal environment. ii) role of the homeostatic system. iii) the role of thermal receptors and the hypothalamus. iv) mechanisms to manage water stress. Assess the learners' presentations for accuracy of scientific facts.

b) examine the adaptations and management of different plant categories (xerophytes, mesophytes, and hydrophytes) based on their osmoregulatory abilities and the application of excretory plant products in everyday life. (u, s, gs, v/a)	a) In pairs, learners search for and discuss: i) plant adaptations to varying water availability in their habitats. ii) techniques employed by humans to manage plants that survive in different environments. Learners create illustrations using a suitable computer program and present their work. Using the project-based learning method, learners investigate excretory products in plants (latex, anthocyanins, oils, quinine, and saponins) to discover their uses in everyday life.	a) Observe the learners' ability to: i) form ideas and make visual illustrations. ii) plan and execute project activities. b) Use probing questions to assess the learners' ability to: i) classify plants according to water requirements. ii) harness excretory products from plants. Assess the learners' write-ups for management strategies and exploitation of plant excretory products.

SENIOR SIX: TERM 1

TOPIC 6: Coordination

Duration: 90 Periods

Competency: The learner assesses the physiological and behavioural processes during organisms' responses to internal and external stimuli, in order to appreciate the adaptive behaviour of organisms and, therefore, promote their welfare to ensure survival and reproductive success.

Learning Outcomes The learner should be able to:	**Suggested Learning Activities**	**Sample Assessment Strategy**
a) examine the role of plant hormones in tropisms, photoperiodism, and the application of these processes in agricultural practices. (u, s, gs, v/a)	a) In groups, learners design and carry out scientific investigations on: i) phototropism. ii) geotropism. Each group writes a report that includes the ecological and agricultural significance of these responses. b) In pairs, learners search for and discuss the role played by Gibberellins, cytokinins, Abscisic Acid, and Ethylene to regulate growth and their commercial applications. They summarise findings and present them to the class. c) Learners carry out a scientific investigation on the effect of ethylene on raw fruits. Learners write a report and present their findings. d) Learners search for/visit a floriculture farm to find out: i) effect of the change in day length on plant flowering. ii) application of changes in day length in floriculture. Make a write-up and present it in a class plenary.	a) Observe the learners' ability to: i) use scientific inquiry skills. ii) collaborate with others during group discussions and activities. b) Use probing questions to find out the learners' understanding of; i) the effect of plant growth regulators and their interactions. ii) effect of day length on flowering. c) Assess the learner's scientific reports for correlation between observations and the manipulation of day length to control flowering.

b) analyse impulse transmission in relation to the structure of a neurone, a chemical synapse, and the factors that influence neural activity in response to environmental stimuli. (u, gs, v/a)	a) Individually, learners search for the structure of a neurone to identify the relationship between the parts and their function. Learners make annotated illustrations and present them to the class. b) In groups learners watch a simulation/video clip on: i) Impulse transmission under varying stimulations. ii) factors affecting impulse transmission speed. They analyse data on impulse transmission and explain the significance of warmups before physical activity and the use of cold packs in first aid. Make a write-up and present the findings to the class. c) In groups, learners watch videos or animations on nervous transmission at a chemical synapse. Make a write-up: i) describing inhibitory and excitatory synapses. ii) explaining the role of local anaesthetics.	a) Observe the learners' ability to: i) use imagination to explore possibilities. ii) interpret and interrogate mathematical data iii) Listen attentively. b) Use probing questions to find out the learners' ability to: i) relate parts of a neurone to their function. ii) explain the properties of neurones. iii) distinguish between inhibitory and excitatory synapses. c) Assess the write-up for the behaviour of the impulse under different temperatures and the influence of local anaesthetics.
c) examine the properties and functions of sensory receptors, the role of the retina in visual perception, and the ear's organs of balance in relation to their response to environmental stimuli. (u, s, gs, v/a)	a) In groups, learners search for and discuss the types of sensory receptors and the stimuli, delving into receptor properties. Make a write-up of their findings and present it to the class. b) In groups, learners search for and discuss the structure of the retina and the distribution of photoreceptor cells. Make a write-up and present findings to the class. c) Learners watch videos or animations illustrating the ear's role in maintaining balance during position and movement. Make a write-up and present their findings to the class.	a) Observe the learners' ability to: i) interact effectively with others. ii) listen and explain ideas. b) Use probing questions to find out the learner's ability to: i) explain the properties of sensory receptors. ii) describe the significance of the distribution of photoreceptor cells. c) Assess the write-up for the role of the vestibular apparatus.

d) examine the adaptive significance of diverse animal behaviour in promoting survival and reproductive success. (u, s, gs, v/a)	In groups, learners carry out a field excursion and observe and analyse innate and learned behaviour. Make a write-up of the significance of each type of behaviour, focusing on survival and reproduction. Present to the class.	a) Observe the learners' ability to: i) Participate in observing different animal behaviour. ii) record their findings. b) Use probing questions to find the learners' ability to: i) identify key features and patterns. ii) explain the significance of each type of behaviour. c) Assess the learner's write-up for: i) comparisons between two types of behaviour. ii) the evolutionary advancement in behavioural patterns.

SENIOR SIX: TERM 2

TOPIC 7: Inheritance and Evolution

Duration: 90 Periods

Competency: The learner appreciates the transmission of traits from one generation to the next, and the mechanisms that drive change in a gene pool, by analysing the concepts of inheritance and evolution, so as to make informed decisions regarding inheritable conditions, for genetic engineering, conservation biology, and health.

Learning Outcomes The learner should be able to:	**Suggested Learning Activities**	**Sample Assessment Strategy**
a) analyse the structural and functional significance of nucleic acids in meiosis and mitosis, their role in cellular functions, and how mutations in nucleotide sequences can contribute to disease (cancer). (u, s, gs, v/a)	a) In groups, learners search for and discuss 3D models of Deoxyribonucleic acid (DNA), Ribonucleic acid (RNA), and chromosome and base-pairing rules. Create 3D models and present their findings in a gallery walk. b) In groups, learners search for the properties of the genetic code. Make a write-up and present the findings to the class. c) In groups, learners watch animations or videos and make a write-up or role-play: i) semi-conservative DNA replication. ii) protein synthesis. Present their findings to the class. d) In groups, learners search and discuss: i) mitosis and meiosis. ii) cancer causes risk factors, prevention, and management. Make a write-up that includes a mind map showing the relationship between cell division and cancer.	a) Observe the learners' ability to: i) innovatively create 3D models. ii) work effectively in diverse teams during role play. b) Use probing questions to find out the learner's: i) understanding of DNA properties. ii) ability to link the genetic code to the structure of proteins. Assess the write-up for the correct sequence of events in cell division, DNA replication, and protein synthesis.
b) assess gene technology techniques, their applications in various fields, and the associated ethical	a) Learners visit any nearby facility specialising in genetic engineering to explore key techniques such as: i) Recombinant DNA Technology, ii) Gene Cloning, iii) and Polymerase Chain Reaction (PCR).	a) Observe the learners' ability to: i) take responsibility for own learning. ii) talk confidently and explain the implications of gene technology. b) Use probing questions to find out the learners'

implications. (u, s, gs, v/a)	Make a report showing their application in genetically modified organisms (GMOs), synthetic insulin production, and vaccine development. b) In groups, learners hold a debate on the ethical, social, and environmental implications of gene technology, particularly GMOs.	understanding of the benefits of gene manipulation. Assess the learners' reports for the correct description of gene technologies and their applications.
c) apply Mendelian principles to predict inheritance patterns and utilise mathematical models to analyse allele frequencies and genotype distributions within populations. (u, s)	a) In groups learners search and use genetic crosses to demonstrate: i) Mendel's 1st law using locally available materials. ii) Mendel's 2nd law of inheritance. Make a write-up and present their findings to the class. b) Learners watch animations or videos on meiosis, focusing on homologous chromosome segregation and independent assortment, and relate these processes to Mendel's laws. Make a write-up and present their findings to the class. c) In pairs, learners search for the Hardy-Weinberg principle and factors that upset the genetic equilibrium. Make a write-up and present their findings to the class.	a) Observe the learners' ability to: i) work effectively in demonstrating Mendel's laws. ii) use calculations to predict allele frequencies. b) Use probing questions to find out the learners' ability to relate Mendel's laws with events during cell division. c) Assess the learners' write-ups for: i) correct format and accuracy of genetic crossings. ii) correct explanations of factors that affect genetic equilibrium.
d) examine different forms of allele interactions (autosomal linkage, multiple alleles, codominance and incomplete dominance), including their examples and influence on phenotypic expression. (u, s, gs)	a) In pairs, learners search for forms of allele interactions and their influence on phenotypic expression. Make a write-up and present it to the class. b) Learners in pairs, carry out a scientific demonstration to show the 3:1 second filial generation dihybrid linkage ratio, using locally available materials. Make write-ups and present them to the class.	a) Observe the learners' ability to: i) interrogate genetic data. ii) predict outcomes of genetic crosses. b) Use probing questions to find out the learners' ability to distinguish Mendelian from non-Mendelian inheritance. c) Assess the learners' write-ups for correct phenotypic and genotypic ratios.

e) analyse evolutionary advancements in key life processes (circulation, reproduction, gaseous exchange, coordination, movement, and excretion), as well as their suitability for survival across different species. (u, s, gs, v/a)	a) Each group of learners searches for and analyse evolutionary advancement in a particular life process i.e. circulation, reproduction, gaseous exchange, coordination, movement and excretion. They use visual aids to summarise their findings. In the gallery walk, learners discuss the significance of these advancements for the survival of living organisms in their environments.	a) Observe the learners' ability to: i) interact effectively in groups. ii) complete visual aids on time. b) Use probing questions to find out the learners' ability to explain how advancement in life processes improves efficiency. Assess the learner's visual aids for evolutionary trends in each life process.
f) assess speciation and resistance, mechanisms driving them, and factors contributing to extinction events, through comparison of historical and contemporary examples. (u, s, gs, v/a)	a) Learners search for isolation mechanisms, speciation, and factors that contribute to extinction. Pair up to discuss and make a write-up to present to the class. b) In groups, learners use problem-based learning to analyse case studies of antimicrobial and pesticide resistance. Make a write-up, explaining the problems, causes and strategies to manage the challenges. Present their findings to the class. c) In groups learners search for timelines of documented mass extinctions, highlighting key events, causes, and effects and the contribution of extinction to evolution. Using a suitable computer program, create infographics to show the findings and present them to the class.	a. Observe the learners' ability to: i) look for patterns in extinction and make general conclusions. ii) suggest and develop solutions for resistance. b. Use probing questions to find out the learner's ability to: i) explain how isolation mechanisms contribute to evolution. ii) explain how resistance arises. Assess the learner's write-up for accurately sequencing events.

TOPIC 8: Growth in Plants and Development in Insects **Duration:** 36 Periods

Competency: The learner justifies changes in the size and complexity of plants and insects, through data analysis of research findings, in order to develop strategies to improve agricultural productivity and environmental sustainability.

Learning Outcomes The learner should be able to:	**Suggested Learning Activities**	**Sample Assessment Strategy**
a) analyse the pre- and post-germination stages during the growth and development of plants in relation to their significance in crop production. (u, s, gs, v/a)	a) In groups, learners search for and discuss: i) the concept of seed dormancy and seed banks. ii) factors affecting and measurement of growth. iii) primary and secondary growth. Make a write-up and present to the class. b) In groups, learners use microscopes to investigate cell size in the different regions of a young dicotyledonous root or shoot. Make a write-up and present it to the class.	a) Observe the learner's ability to: i) work effectively in searching for information about growth in plants. ii) count and estimate cell size. b) Use probing questions to find out the learners' understanding of the significance of primary and secondary growth. c) Assess the learners' write-up for the significance of seed dormancy and banks.
b) analyse the role of insect growth stages in ecosystems, focusing on their contributions to waste management, food security, and water quality assessment. (u, s)	In groups, learners search for the roles of insect growth stages in ecosystems focusing on: i) waste management. ii) food security. iii) determining water quality assessment. Make a write-up and present it to the class.	a) Observe the learner's ability to: i) sort and analyse information on insect role of insect growth stages. ii) use a range of media to present findings. b) Use probing questions to find out the learner's understanding of indicator species c) Assess the learner's write-up for correct biological facts.

SENIOR SIX: TERM 3

TOPIC 9: Ecology

Duration: 90 Periods

Competency: The learner evaluates the interactions within ecosystems by analysing data and personal experiences to develop strategies for enhancing food security and promoting sustainable management of natural resources.

Learning Outcomes The learner should be able to:	**Suggested Learning Activities**	**Sample Assessment Strategies**
a) Analyse population dynamics and the factors affecting them in different ecosystems. (u, s, gs, v/a)	a) In pairs, learners search for and discuss the following population dynamics in different ecosystems: i) population characteristics. ii) population growth. iii) factors affecting population density. Learners make a write-up and present their findings to the class. b) In groups, learners conduct field studies to estimate population density using quadrats and capture-recapture techniques in different ecosystems. Make a report and present it to the class.	a) Observe the learners' ability to: i) use numbers and measurements accurately. ii) Interpret and interrogate population data. b) Use probing questions to find out the learners' ability to take precautions and assumptions to obtain accurate results. Assess the learners' write-up for facts on population ecology.
b) Analyse the processes of ecological succession and strategies for effective ecological restoration practices in diverse environments.	a) In pairs, learners search for and discuss: i) The role of primary and secondary succession in preserving biodiversity ii) techniques and benefits for restoring degraded ecosystems. Make a write-up and present their findings to the class. b) In groups, learners plan, design and implement a small-scale restoration project on a degraded area within or around the school. Make a project report and present to the rest of the class.	a) Observe the learners' ability to: i) appreciate ecological diversity. ii) evaluate different solutions for ecological restoration. b) Use probing questions to find out the learners' ability to identify degraded ecosystems. c) Assess the learner's write-up for the correct change in community structure in the seral stages.

c) examine the concept of energy flow through ecosystems, its role in maintaining ecosystem stability, and the impact of human activities on energy flow. (u, s)	a) In groups, learners search for and discuss: i) the concept of energy flow in the ecosystem. ii) effect of human activities on energy flow. Use a suitable computer program to illustrate energy flow in the ecosystem and present it to the class. In groups, learners search for and discuss: i) Bio-accumulation, bio-magnification, and feed conversion ratio, their importance and relationship to energy transfer/flow. ii) Significance of bioaccumulation and bio-magnification to the health of organisms and the environment in an ecosystem. iii) Applications of feed conversion ratios. Learners carry out a scientific investigation on feed conversion ratio in a small mammal (rat or rabbit) using different diets. Learners write a report and present it to the class in a plenary.	a) Observe the learners' ability to: i) use ICT tools to communicate findings. ii) Interpret and interrogate bioaccumulation data. b) Use probing questions to find out the learners: i) ability to explain energy losses in the ecosystem. ii) understanding of the effect of biomagnification on the health of organisms. Assess the learners' presentations/reports for the understanding of animal feeding efficiency.
d) explain the concept of carbon footprint in relation to climate change, including its measurement, as well as the role of carbon sequestration in mitigating climate change. (u, gs, v/a)	a) In pairs, learners search for and discuss: i) the concept of carbon footprint and its measurement. ii) activities that contribute to carbon output and key sources of greenhouse gas emissions. Use ICT tools to present findings.	a) Observe the learners' ability to: i) use technology to communicate and refine work. ii) work effectively in diverse teams. b) Use probing questions to find out the learners' understanding of how carbon sequestration in forests reduces the impact of climate change. c) Assess the learner's presentation on how carbon sequestration mitigates climate change.

e) examine the impact of invasive species on native biodiversity, ecosystems, and economies, as well as strategies for their management and control. (u, s, gs, v/a)	b) Using problem-based learning method, learners analyse terrestrial or aquatic invasive species case study to find the: i) characteristics of invasive species ii) their impacts on native biodiversity, ecosystems, and economies. iii) strategies to manage and control the invasive species. Each group writes a report to present their findings. c) Using problem-based learning method, Learners examine a case study of a pest infestation controlled using biological agents. Each group make a write-up and present to the class.	a) Observe the learners' ability to: i) identify problems and ways forward. ii) Interact effectively with others. b) Use probing questions to find out the learners' understanding of: i) the effect of invasive species on ecosystems. ii) benefits of biological control over pesticides. c) Assess the learner's report for the feasibility of the proposed control measures.
f) analyse the concept of food security, focusing on its components and sustainable agricultural practices to address its challenges. (u, s, gs, v/a)	a) In groups, learners search for and discuss: i) components of food security; availability, access, utilisation, and stability. ii) their roles in maintaining a stable food supply. iii) threats and solutions to food security. Make a write-up and use ICT tools to present the findings.	a) Observe the learners' ability to: i) use ICT tools to communicate. ii) work effectively in diverse teams. b) Use probing questions to find out the learners' ability to explain the components of food security. c) Assess the learners' write-up for sustainable agricultural practices, and how they support food security.

3.0 ASSESSMENT

3.1 Assessing Biology

This Advanced Secondary Curriculum sets new expectations for learning, with a shift from Objectives to Learning Outcomes that focus mainly on the application of knowledge and deeper learning that leads to the acquisition of skills. These Learning Outcomes require a different approach to assessment. The "Learning Outcomes" in the syllabi are set out in terms of Knowledge, Understanding, Skills, Values and Attitudes. This is what is referred to by the letters k, u, s v & a.

It is not possible to assess values and attitudes in the same way as knowledge, understanding, and skills because they are more personal and variable, and are long-term aspirations. This does not mean that values and attitudes are not important or cannot be assessed. They too can be assessed but not easily done through tests and examinations. Values and attitudes can be assessed over a period of time through observing and having interactions with the learner.

To assess knowledge and its application, understanding, and skills, we need to look for different things. Knowledge can be assessed to some extent through written tests, but the assessment of skills, application of what is learnt, and deeper understanding requires different approaches. Because of this, the role of the teacher in assessment becomes much more important. This section focuses on knowledge, understanding, and skills.

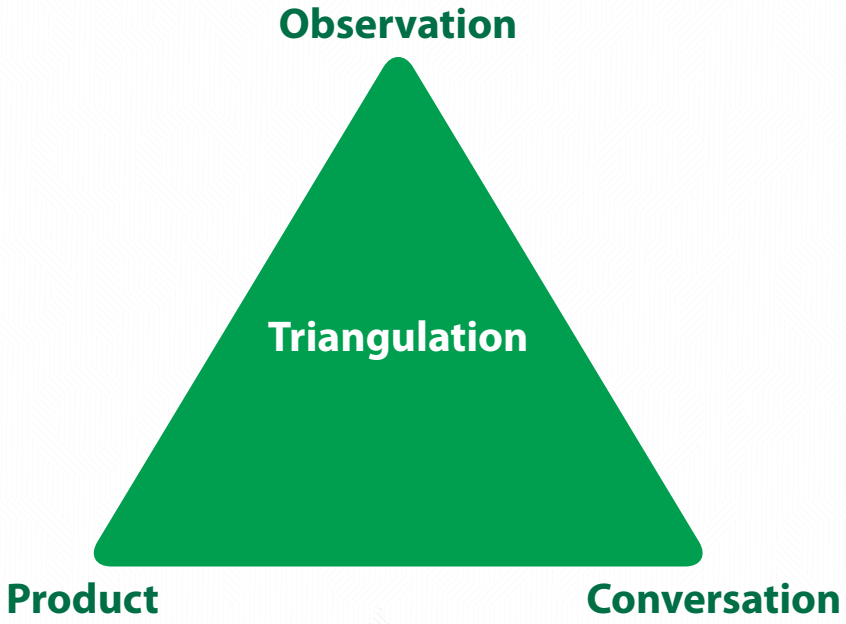
3.2 Formative Assessment

In this curriculum, the teacher's role in assessment is not only to write tests for the learner but also to make a professional judgment about the learner's learning during the teaching and learning process. The professional judgment is about how far the learner achieves the Learning Outcomes that are set out in this syllabus. To make these judgments the teacher needs to look at how well the learner is performing in terms of each Learning Outcome.

The formative assessment opportunities occur in three forms. They can be done through:

a. Observation – watching learners working (good for assessing skills, values, and attitudes)
b. Conversation – asking questions and talking to learners (good for assessing knowledge and understanding)
c. Product – appraising the learner's work (writing, report, translation, calculation, presentation, map, diagram, model, drawing, painting, etc). In this context, a "product" is seen as something physical and permanent that the teacher can keep and look at.

When all three are used, the information from anyone can be checked against the other two forms of assessment opportunity (e.g. evidence from "observation" can be checked against evidence from "conversation" and "product"). This is often referred to as "triangulation.



3.3 Assessing Generic Skills

The Generic Skills have been built into the syllabuses and are part of the Learning Outcomes. It is therefore not necessary to assess them separately. It is the increasingly complex context of the subject content that provides progression in the Generic Skills, and so they are assessed as part of the subject Learning Outcomes. Assessing generic skills is done with the help of an observation checklist and scoring rubric.

3.4 Assessing Values/Attitudes

It is not possible to assess values and attitudes in the same way as knowledge, understanding, and skills because they are more personal and variable and are long-term aspirations. This does not mean that attitudes are not important. It means that we must value things that we cannot easily assess through tests and examinations. However, values and attitudes can be assessed over a long period of time through observation and interactions.

3.5 Assessment of Project-based Learning

Project-based learning is a teaching method in which learners or participants gain knowledge and skills by engaging for an extended period of time to investigate and respond to an authentic challenge. The task must have a driving question and it involves sustained inquiry.

Project-based learning is assessed using a rubric and an observation checklist.

3.6 Examinations

There will be only one school-based summative assessment at the end of the year. There will no longer be examinations or tests set at the beginning and end of every term. Instead, there will be a summing up of ongoing teacher assessments made in the context of learning through end-of-topic scenario-based tasks (Activities of Integration). The learners will also be subjected to the end-of-cycle assessment for certification.

3.7 Record Keeping

In competency-based learning, accurate and comprehensive record-keeping is crucial to track learners' progress and achievements. Therefore, the teacher and school must keep accurate records of learners' achievements.

Various assessment tools and strategies are employed to capture learners' demonstration of abilities and achievements, including observation checklists, rubrics, and scoring grids. These tools provide a holistic picture of learners' strengths, weaknesses, and areas for improvement.

The collected data and evidence from these assessments are correctly recorded and maintained in learners' files, portfolios, and anecdotal notes.

GLOSSARY OF KEY TERMS

Term	Definition
Competency curriculum	One in which learners develop the ability to apply their learning with confidence in a range of situations.
Differentiation	The design or adaptation of learning experiences to suit an individual learner's needs, strengths, preferences, and abilities.
Formative assessment	The process of judging a learner's performance, by interpreting the responses to tasks, to gauge progress and inform subsequent learning steps.
Generic skills	Skills that are deployed in all subjects, and which enhance the learning of those subjects. These skills also equip young people for work and life.
Inclusion	An approach to planning learning experiences that allows each student to feel confident, respected, safe, and equipped to learn at his or her full potential.
Learning outcome	A statement that specifies what the learner should know, understand, or be able to do within a particular aspect of a subject.
Process skill	A capability acquired by following the programme of study in a particular Learning Area; enables a learner to apply the knowledge and understanding of the Learning Area.
Sample assessment activity	An activity that allows a learner to show the extent to which s/he has achieved the Learning Outcomes. This is usually part of the normal teaching and learning process and not something extra at the end of a topic.
Suggested learning activity	An aspect of the normal teaching and learning process that will enable a formative assessment to be made.

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