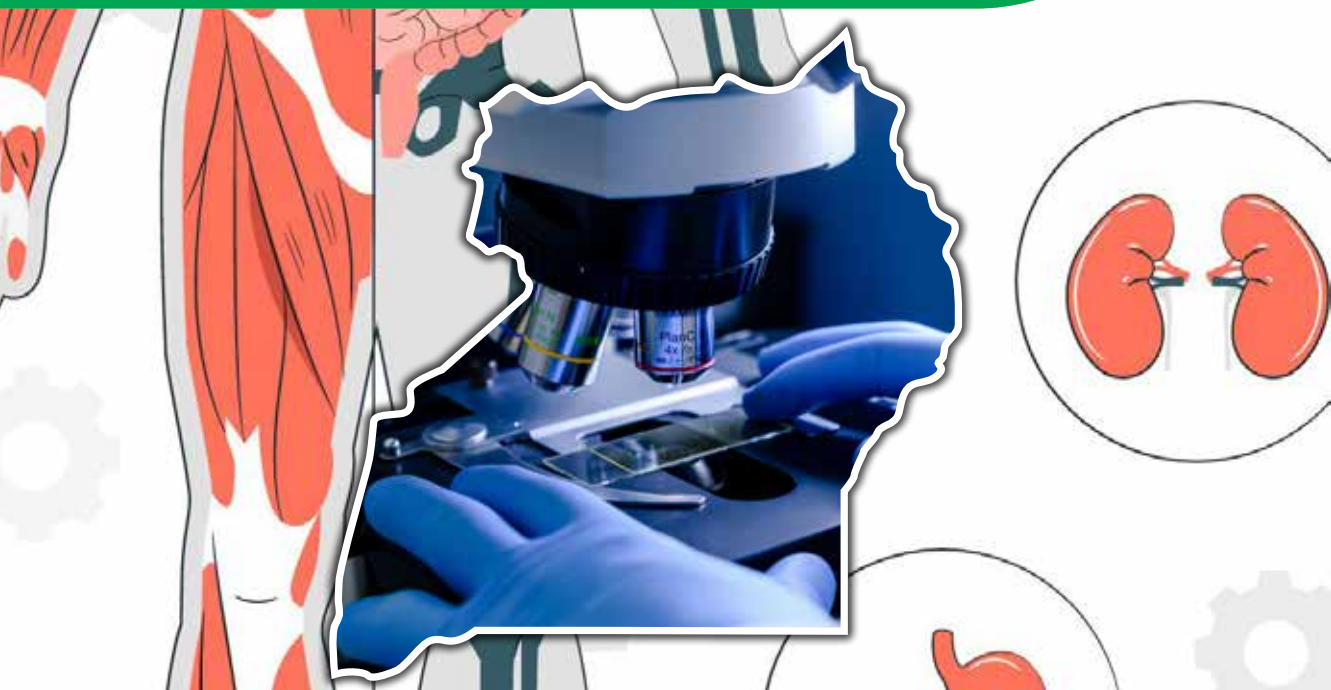


ACCELERATED EDUCATION PROGRAMME

BIOLOGY

SYLLABUS

REVISED LOWER SECONDARY (Level 1 and 2)



MINISTRY OF
EDUCATION
AND SPORTS



NCDC
NATIONAL CURRICULUM
DEVELOPMENT CENTRE

ACCELERATED EDUCATION PROGRAMME

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REVISED LOWER SECONDARY (Level 1 and 2)



MINISTRY OF
EDUCATION
AND SPORTS





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Contents

Foreword	v
Acknowledgement	vii
Introduction	viii
Introduction to Accelerated Education Programme	x
Key Changes in the Aep Curriculum	xi
Ict Integration	xviii
Integration of Special Needs Education (SNE)	xix
The Rationale of the Biology Syllabus in the AEP	xxi
Programme Planner	xxii
Features of this New AEP Syllabus	xxv
Level One: Term 1	1
Theme: Diversity of Living Things	1
Topic 1: Introduction to Biology	1
Topic 2: Cells	2
Topic 3: Classification	4
Topic 4: Insects	8
Level One: Term 2	10
Theme: Diversity of Living Things	10
Topic 5: Flowering Plants	10
Theme: Soil	12
Topic 6: Physical and Chemical Properties of Soil	12
Topic 7: Soil Erosion and Conservation: Causes, Effects and Prevention	14
Theme: Nutrition in Plants and Animals	16
Topic 8: Nutrition Types and Nutrient Compounds	16
Level One: Term 3	18
Theme: Nutrition in Plants and Animals	18
Topic 9: Nutrition in Green Plants	18
Topic 10: Nutrition in Mammals	20
Theme: Transport in Plants and Animals	23
Topic 11: Transport in Plants	23
Topic 12: Transport in Animals	25
Level Two Term 1	27
Theme: Respiration in Plants and Animals	27
Topic 1: Gaseous Exchange	27
Topic 2: Aerobic and Anaerobic Respiration	29

Theme: Excretion	31
Topic 3: Excretion in Animals.....	31
Theme: Coordination in Animals.....	32
Topic 4: Chemical Coordination in Humans	32
Topic 5: Nervous Coordination in Humans	34
Level Two Term 2.....	36
Theme: Coordination in Animals.....	36
Topic 6: Receptor Organs in Man.....	36
Theme: Locomotion in Animals.....	37
Topic 7: Locomotion in Mammals	37
Theme: Growth and Development in Plants and Animals	39
Topic 8: Growth in Plants and Animals	39
Topic 9: Development in Plants and Animals	41
Theme: Reproduction in Organisms	43
Topic 10: Asexual Reproduction in Plants (Vegetative Reproduction)	43
Topic 11: Sexual Reproduction in Plants	44
Level Two.....	46
Term 3	46
Theme: Reproduction in Organisms	46
Topic 12: Sexual Reproduction in Human.....	46
Theme: Genetics.....	49
Topic 13: Inheritance.....	49
Theme: Interrelationships	51
Topic 14: Introduction to Ecology.....	51
Topic 15: Food Chains and Food Webs.....	52
Topic 16: Associations in Biological Communities	54
Topic 17: Humans and the Natural Environment	55
Assessment in the Accelerate Education Programme	56
Assessing the New Expectations for Learning	56
Formative Assessment	58
Triangulation of Assessment	61
Summative Assessment.....	61
Record Keeping	62
Glossary of Key Terms	65

Foreword

Education is a fundamental tool for the protection of conflict- and disaster-affected children and youth from harm and exploitation. This is a crucial part of UNESCO's advocacy messages. Under appropriate conditions of security, the provision of education can help protect children and youth from recruitment into fighting forces, forced labour, prostitution, drug abuse and other criminal activities. In post-conflict settings, education contributes to the reintegration into society of former soldiers and other children and youth associated with fighting forces.

Uganda's Education Act of 2008, in Part IX, Miscellaneous Provisions 49, clearly states that "there shall be non-formal education centres" for purposes of providing non-formal education. Examples of non-formal education programmes include Accelerated Education Programmes (AEPs) for the conflict areas at both primary and secondary levels, Alternative Basic Education for Karamoja (ABEK), Basic Education for Urban Poverty Areas (BEUPA), Complementary Opportunity for Primary Education (COPE) and Child-Centred Alternative Non-Formal Community Based Education (CHANCE), among others.

The National Curriculum Development Centre (NCDC), in collaboration with War Child Canada, embraced the Accelerated Education Programme (AEP) and has condensed the lower secondary curriculum to come up with the Lower Secondary Accelerated Education Programme appropriate to learners in refugee camps and the host communities of secondary school age (ages 16–45+). The AEP at lower secondary school level focuses on completing learning in a shorter period of time, i.e., two years. The AEP is complementary both in providing an alternative route and in matching its curriculum to the 'official' curriculum, thus allowing learners to return to formal schooling at an opportune stage. The programme intends to promote access to education in an accelerated timeframe for disadvantaged groups, out-of-school and over-age children, and youth who missed out or had their education interrupted owing to poverty, violence, conflict or any calamity.

The goal of this programme is to provide learners with competencies equivalent to those in the formal system in an accelerated time frame, with learners either transitioning back into the mainstream education or exiting with some of the competencies required for work.

It is my hope that AEP will register considerable success in meeting the educational needs of these underserved populations not only in terms of access and equity, but also in helping them return to school and complete the education cycle, and especially in getting measurable learning outcomes.

I recommend the AEP and trust that the materials will be valuable in your endeavour to meet the educational needs of the refugee learners and other beneficiaries from the host communities.



Prof. George Openjuru

CHAIRPERSON

NCDC Governing Council

Acknowledgement

The National Curriculum Development Centre (NCDC) would like to express its gratitude to War Child Canada, Uganda for the financial support, guidance in overseeing and taking timely decisions when necessary, during the development and production of this AEP Biology Syllabus.

The Centre also expresses its gratitude to NCDC Subject Specialists and panel members for their professional guidance and technical assistance.

Furthermore, NCDC recognises the work of editors who worked with the writers throughout the development of this syllabus.

The Centre takes responsibility for any shortcomings that might be identified in this syllabus and welcomes suggestions for addressing the inadequacies. Such comments and suggestions may be communicated to NCDC through mail at P.O. Box 7002, Kampala; or e-mail at admin@ncdc.org.ug or www.ncdc.org.ug.



Dr Grace K. Baguma

DIRECTOR

National Curriculum Development Centre

Introduction

The UNESCO Education Strategy (2014 – 2021) advocates for a humanistic and holistic vision of education as a fundamental human right that is essential to personal and socio-economic development. UNESCO further recommends societies that are just, inclusive, peaceful and sustainable by 2030. Vision 2040 of Uganda aims to transform Uganda into a modern and prosperous country, while the National Development Plan III (NDPIII) recognises the existing weaknesses in education, including the low efficiency and variable quality at the Secondary level. Furthermore, NDPIII focuses on enhancement of human capital, development, strengthening mechanisms for quality, effective and efficient service delivery as well as improvement of quality and relevance of skills development.

The Sustainable Development Goal 4 advocates for inclusive and quality education. The NRM Manifesto (2016-2021), emphasises continuous assessment examination systems, strengthening soft skills, which promote self-esteem, conscientiousness and a generally positive attitude to work, promoting e-learning and computer literacy in order to enhance learning outcomes.

The above aspects are lacking and where they exist, it is at a minimum level in implementation of the curriculum.

In alignment with the above policies, the Education and Sports Sector Strategic Plan (2017/20) advocates for delivery of equitable, relevant and quality education for all. The current Secondary school curriculum for Uganda, although highly regarded, has focused on the needs of a small academically oriented elite leaving out the needs of the majority of learners. The Ministry of Education and Sports (MoES) through the National Curriculum Development Centre (NCDC) therefore, undertook a review of the Lower Secondary Curriculum, aimed at providing a learning environment, opportunities, interactions, tasks and instructions that foster deep learning by putting the learner at the centre of the learning experience. This is in line with the following aims of secondary education in Uganda:

The aims of Secondary education in Uganda are to:

- Instil and promote national unity, an understanding of the 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 co-operation;
- Promote an appreciation and understanding of the cultural heritage of Uganda including its languages;
- Impart and promote a sense of self discipline, ethical and spiritual values, personal and collective responsibility and initiative;
- Enable individuals to acquire and develop knowledge and an understanding of emerging needs of society and the economy;
- Provide up-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 socio-economic development of Uganda;
- Enable individuals to develop basic scientific, technological, technical, agricultural and commercial skills required for self-employment;
- Enable individuals to develop personal skills of problem solving, information gathering and interpretation, independent reading and writing, self-improvement through learning and development of social, physical and leadership skills such as are obtained through games, sports, societies and clubs;
- Lay the foundation for further education;
- Enable the individual to apply acquired skills in solving problems of community, and to develop a strong sense of constructive and beneficial belonging to that community;
- Instil positive attitudes towards productive work and strong respect for the dignity of labour and those who engage in productive labour activities;
- Develop a positive attitude towards learning as a lifelong process.

Introduction to Accelerated Education Programme

Worldwide, substantial alternative schooling programmes are developed to meet the basic education needs of under-reached children. It has been increasingly recognised that the goals of education for all cannot be achieved unless more attention is paid to educating out-of-school children (UNESCO, Global Monitoring Report, 2008). Indeed, the UNESCO Global Monitoring Report 2010, 'Reaching the Marginalized', focused on this issue. In a bid to help developing countries achieve the Sustainable Development Goals, there should be initiatives to incorporate elements of accelerated learning to achieve SDG 4. The Accelerated Education Programme (AEP) in Uganda is a form of curriculum option which combines the stronger features of earlier mainstreaming approaches into the new design to raise the success rates for refugee community learners. The AEP secondary school tier is a bigger stride to address the education gap within refugee communities not only in Uganda but also in other neighbouring countries. With the lessons and experiences gained from running the Primary Accelerated Education Programmes, the Secondary AEP has been designed to compress the entire process of education and its cognitive, emotional and social components.

The AEP at secondary school level focuses on completing learning in a shorter period of time, i.e. two years. The AEP is complementary both in providing an alternative route and in matching its curriculum to the 'official' curriculum, thus allowing learners to return to formal schooling at an opportune stage. The programme intends to promote access to education in an accelerated time frame for disadvantaged groups, out-of-school and over-age children, and youths who missed out or had their education interrupted due to poverty, violence, conflict and any calamity. The goal of this programme is to provide learners with competencies equivalent to those in the formal system in an accelerated time frame, with learners either transitioning back into the mainstream education or exiting with some competencies required for work. Ideally, teaching AEP calls for a methodology that is interactive and learner-centred, incorporating other aspects of multiple-intelligence learning.

Since the teaching and learning are accelerated, and the curriculum content is compressed and condensed, the four core pillars of the accelerated learning cycle are key learning outcomes, values, generic skills and cross-cutting issues.

Alternative subjects have been intentionally included in this programme; for example, life skills, peace education, environment and HIV and AIDS, which are responsive to the context. Learners of AEP need alternative supporting knowledge and life skills to survive in this challenging world. It is important to note that the concept of accelerated learning requires an extremely well-resourced classroom and exceptionally well-trained teachers. The expanded learning time from the norm is because the teaching methodology is interactive and learner-centred.

It is our hope that AEP will register considerable success in meeting the educational needs of these underserved populations not only in terms of access and equity, but also in helping them return to school and complete the education cycle, and especially in getting measurable learning outcomes.

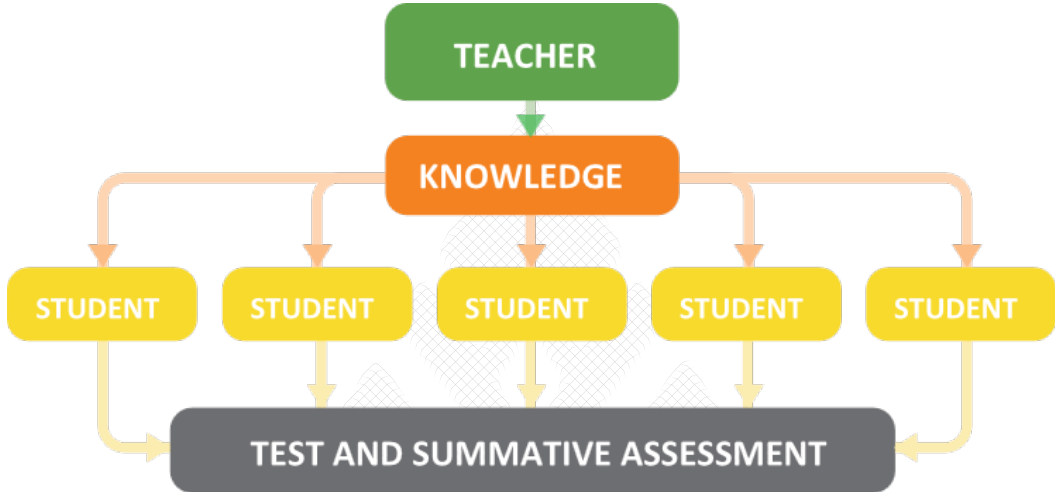
Key Changes in the AEP Curriculum

The key change in the curriculum is a move from a knowledge-based syllabus to a competence and skill-based one. It is no longer sufficient to accumulate large amounts of knowledge. Young people need to develop the ability to apply their learning with confidence in a range of situations. They need to be able to use knowledge creatively. A level of competence is the ability to use knowledge rather than just to acquire it. This requires an active, learner-centred rather than passive, teacher-centred approach.

This approach to teaching and learning is in support of the Sustainable Development Goals (SDG's), otherwise known as the Global Goals. These are a universal call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity. The key changes in the syllabus will ensure that Uganda is making good progress towards SDG 4 in particular which aims to ensure equitable and quality education and promote lifelong learning opportunities for all.

The change can be summarised in the following diagram.

THE KNOWLEDGE-BASED CURRICULUM



Knowledge-based teaching was based on transferring knowledge from the teacher to the students. The teacher had knowledge and transferred this knowledge to the students by lecturing, talking, and asking them to read the text book or writing notes on the board for the students to copy and learn. Students acquired the knowledge, often without fully understanding it, and were tested at the end of a topic, term or school course to see if they had remembered it. The knowledge was based mainly on the knowledge in the subjects traditionally taught at university, and little attempt was made to make it relevant to young people's own lives. The whole education system was seen by many people as a preparation for university, but the vast majority of learners never reach university. The curriculum caters for this majority as well as those who later on go to university.

THE COMPETENCE BASED CURRICULUM



In the competence-based approach, the “student” becomes a “learner”. The Learning Outcomes can only be achieved through active engagement in the learning process rather than simply absorbing knowledge given by the teacher.

The teacher needs to build on the learners’ own knowledge and experience and create Learning Activities through which learners can explore the meaning of what is being learned and understand how it is applied in practical situations.

Teaching and learning become a two-way process of dialogue between the Teacher and Learners. Learners also learn from each other through discussion. Assessment also becomes a two-way process of formative and summative assessment; not just to give grades but to find out problems the learners may be having and help to solve them.

Key Learning Outcomes

This curriculum sets out ‘Key Learning Outcomes’ that sum up the expectations of the syllabus as a whole, and also set out clearly the qualities that young people will develop.

By the end of the educational process, young people will become:

1) **self-assured individuals who:**

- a) demonstrate self-motivation, self-management and self-esteem.
- b) know their preferences, strengths and limitations.
- c) adjust their behaviour and language appropriately to different social situations.
- d) relate well to a range of personality types.

2) **responsible and patriotic citizens who:**

- a) cherish the values promoted in the curriculum.
- b) promote equity, the development of indigenous cultures and languages and appreciate other people’s cultures.
- c) apply environmental and health awareness when making decisions for themselves and their community.
- d) are positive in their identity as individuals and global citizens.
- e) are motivated to contribute to the well-being of themselves, their community and the nation.

3) **lifelong learners who:**

- a) can plan, reflect, and direct their learning.
- b) actively seek lifelong learning opportunities for personal and professional development.

4) **positive contributors to society who:**

- a) have acquired and can apply the generic skills.
- b) demonstrate knowledge and understanding of the emerging needs of the society and economy.
- c) understand how to design, make and critically evaluate products and processes to address needs.
- d) appreciate the physical, biological and technological world and make informed decisions about sustainable development and its impact on people and the environment

Values

This curriculum is based on a clear set of values. These values underpin the whole curriculum and the world of work. They are also the values on which learners need to base their lives as citizens of a nation. The values are derived from The Uganda National Ethics and Values Policy of 2013. They are:

- a) respect for humanity and the environment;
- b) honesty, upholding and defending the truth at all times;
- c) justice and fairness in dealing with others;
- d) hard work for self-reliance;
- e) integrity, moral uprightness and sound character;
- f) creativity and innovativeness;
- g) social responsibility;
- h) social harmony;
- i) national unity; and
- j) national consciousness and patriotism.

These values are not taught directly in lessons, nor will they be assessed, but will inform and shape the teaching and learning of the entire programme.

Generic Skills

The generic skills also known by several other names, including key skills, core skills, essential skills, key competencies, necessary skills, transferable skills and employability skills are versatile skills that have wide applicability across various jobs, education, and life situations, contributing to personal and professional success and societal well-being.

Changes in the modern workplace brought about by technology, management innovations, and increased competition in the global marketplace, have led to many concerns about the adequacy of workforce skills. In response to calls to reform education to better prepare young people for the future workforce, changes to the curriculum have emphasised the teaching of general skills (e.g. problem solving, creativity, critical thinking, communication, collaboration).

For this reason, generic skills lie at the heart of every subject. Apart from enabling learners to access and deepen learning across the curriculum, generic skills allow young people to develop into lifelong learners who can adapt to change and cope with the challenges of life in the 21st Century.

Young people need to be able to think critically and solve problems at school, work and home. They need to be creative and innovative in their approach to learning and life. They must be able to communicate well in all forms, co-operate with others and also work independently. They must also be able to use functional mathematics and ICT effectively. The breakdown of generic skills is provided below

01 Critical thinking and problem-solving skills

- a) Plan and carry out investigations
- b) Sort and analyse information
- c) Identify problems and ways forward
- d) Predict outcomes and make reasonable decisions
- e) Evaluate different solutions

03 Co-operation and self-directed learning

- a) Work effectively in diverse teams
- b) Interact effectively with others
- c) Take responsibility for own learning
- d) Work independently with persistence
- e) Manage goals and time

02 Creativity and innovation

- a) Use the imagination to explore possibilities
- b) Work with others to generate ideas
- c) Suggest and develop new solutions
- d) Try out innovative alternatives
- e) Look for patterns and make generalisations

04 Communication

- a) Listen attentively and with comprehension
- b) Talk confidently and explain opinions/ideas clearly
- c) Read accurately and fluently
- d) Write and present ideas coherently
- e) Use a range of media to communicate ideas

05 Mathematical computation and ICT proficiency

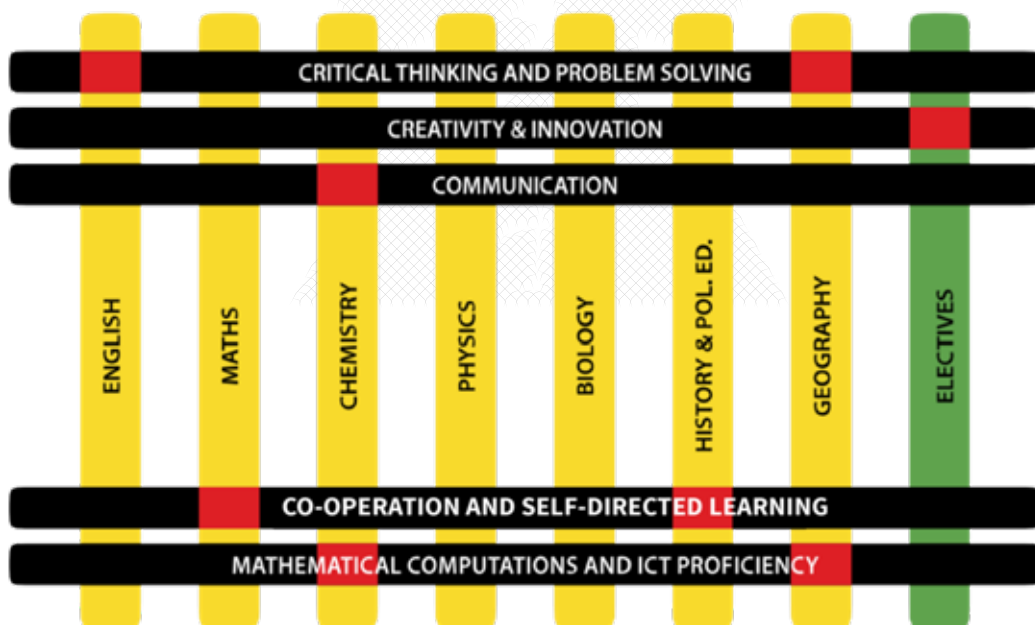
- a) Use numbers and measurements accurately
- b) Interpret and interrogate mathematical data
- c) Use mathematics to justify and support decisions
- d) Use technology to create, manipulate and process information
- e) Use technology to collaborate, communicate and refine one's work

Generic Skills Within Biology

These skills are not separate subjects in themselves; they are developed within Biology and help learning within the subject. It is when the generic skills are deployed that learning is most effective.

Generic skills are a key part of the biology syllabus. They have been built into the syllabus to provide the context for the skills development. Biology provides a rich context for learners to communicate, co-operate and think critically about how the world works and to understand the world from a scientific point of view.

Skills progression is provided for by the increasing complexity of the subject matter within Biology. For example, within the critical thinking skill, learners begin thinking critically about the relatively simple subject matter in level 1 and then progress to thinking about the much more complex matters in level 2. Thus, the progression lies in the increasing complexity of the matters being thought about.



Cross-cutting Issues

There are some issues that young people need to learn about, but which are not confined to one subject. These are called ‘cross-cutting issues’, and they need to be studied across the subjects.

These issues develop learners’ understanding of the connections between the subjects and the complexities of life.

The cross-cutting issues identified in the curriculum are:

- a) environmental awareness;
- b) health awareness;
- c) mixed abilities and involvement;
- d) life skills;
- e) socio-economic challenges; and
- f) citizenship and patriotism.

These have been built into the syllabus of each subject. The way in which they operate within the subject is very similar to the generic skills. Biology provides a very good context for considering environmental and health awareness, and for understanding the complex and diverse world in which we live.

ICT Integration

ICT has been integrated as a learning and teaching tool across all subjects. ICT teachers should endeavour to assist other subject teachers in making ICT integration process a reality. In other subject syllabi, ICT integration guidelines have been included. The ICT integration draft framework is summarised below.

Category of a Task in the Syllabus	ICT Application (How ICT Will be Integrated for the Task Category)
Fieldwork	Use of cameras to take photos and record videos
Presentations in class	Use presentation application
Keywords and meanings	Use online dictionary or search online
Drawings/graphics	Use Publishing software, Word processor
Role-play, narrations	Use audio and video recordings
Present findings in graphic and written formats	Use Desktop Publishing software or Word processor

Category of a Task in the Syllabus	ICT Application (How ICT Will be Integrated for the Task Category)
Showing data charts	Use Spreadsheet software
Group discussions	Mind-mapping software
Search for extra reading materials	Download files from the Internet or by sharing
Writing equations and formulas	Use equation editors
Carrying out academic research	Using the Internet and other academic applications like “Encarta”, “Britannica,” etc.
Sharing or learning with people across the world	Forming learning networks, formation of blogs, social media, emails, etc.

Integration of Special Needs Education (SNE)

In education system, learners of different abilities study together in the same class and in some developed countries, they are taught separately. In whatever case, the following methods are important when handling the SNE learners.

Category of impairments	SNE Teaching Methods
<p>Blind learners: Learners who cannot see totally</p>	<ul style="list-style-type: none"> • Through touching • Use of brails • Recorded / audio materials
<p>Low vision learners: Learners who cannot see properly</p>	<ul style="list-style-type: none"> • Use of large print materials • Use of bold teaching materials • Right placement of learners
<p>Deaf learners: Learners who do not hear at all</p>	<ul style="list-style-type: none"> • Use sign language • Total communication • Use of illustrations
<p>Hard of hearing learners: Learners who fairly hear</p>	<ul style="list-style-type: none"> • Total communication • Speak loudly

Category of impairments	SNE Teaching Methods
	<ul style="list-style-type: none"> • Right placement of learners • Use of illustrations • Being more practical
Dyslexic learners: Learners with reading difficulties	<ul style="list-style-type: none"> • Use less written content • Talk more than writing • Breaking tasks into simple steps • Repetition in teaching • Use of audio recordings
Time takers	<ul style="list-style-type: none"> • Give extra time • Use remedial classes
Hyper learners: Learners with attention deficit	<ul style="list-style-type: none"> • Use of timely breaks in teaching.
Gifted learners:	<ul style="list-style-type: none"> • Involve them in extra work • Use of suitable challenging tasks
Physically handicapped	<ul style="list-style-type: none"> • Use of head pointers • Training to use available limbs • Creating special sitting arrangements in class

The Rationale of the Biology Syllabus in the AEP

This AEP Biology Syllabus is aimed at providing the teacher with guidance to teach Biology to learners who will not go through the normal four years of Ordinary level classes. It is meant to cover the most critical aspects of Biology without affecting its standards. It will adequately prepare learners for Uganda Certificate of Education (UCE). However, the creativity of the classroom teacher is important in this case.

The aims of teaching the AEP Biology Syllabus are to:

- a) provide, through well-designed studies of experimental and practical science, a worthwhile educational experience for all learners, and to enable them to acquire sufficient scientific knowledge and understanding that prepare them for the challenges of the 21st Century.
- b) enable learners to become confident citizens in a technological world, who are able to take or develop an informed interest in scientific matters.
- c) enable learners to recognise the usefulness and limitations of Biology and to appreciate its applicability to other disciplines and to everyday life.
- d) enable learners to be suitably prepared for studies beyond O-level.
- e) encourage efficient and safety practices both during experimental work and in society.
- f) develop attitudes relevant to science in general and Biology in particular, such as concern for accuracy and precision, objectivity, integrity, enquiry, inventiveness and innovativeness.
- g) promote awareness that the study and practice of Biology are co-operative and cumulative activities, that are subject to social, economic, technological, ethical and cultural influences, justifications and limitations.
- h) stimulate interest in and care for the environment and proper utilisation of resources with respect to Uganda.

Programme Planner

The Accelerated Education Programme for Biology is divided into 29 topics which will be taught in two years. The topics for the two years are indicated in the table.

LEVEL ONE	THEME	TOPIC	DURATION (HOURS)
Term 1	Diversity of living things	1) Introduction to Biology	2
		2) Cells	4
		3) Classification	14
		4) Insects	6
Term 2	Diversity of living things	5) Flowering plants	5
	Soil	6) Physical and chemical properties of soil	7
		7) Soil erosion and conservation; causes, effects and prevention	4
	Nutrition in Plants and animal	8) Nutrition types and Nutrient compounds	6
Term 3	Nutrition in Plants and Animals	9) Nutrition in green plants	3
		10) Nutrition in mammals	10
	Transport in Plants and Animals	11) Transport in plants	4
		12) Transport in animals	7
		Total	72

LEVEL TWO	THEME	TOPIC	DURATION (NUMBER OF HOURS)
Term 1	Respiration in Plants and Animals	1) Gaseous exchange	6
		2) Aerobic respiration and anaerobic respiration	6
	Excretion	3) Excretion in animals	4
	Co-ordination in Animals	4) Chemical coordination in humans	6
Term 2	Co-ordination in Animals	5) Nervous coordination in humans	5
		6) Receptor organs in man	2
	Locomotion in Animals	7) Locomotion in mammals	4
	Growth and Development in Plants and Animals	8) Growth in plants and animals	4
		9) Development in plants and animals	5
	Reproduction in Organisms	10) Asexual reproduction in plants (vegetative reproduction)	2
		11) Sexual reproduction in plants	5
Term 3	Reproduction in Organisms	12) Sexual reproduction in humans	9
	Genetics	13) Inheritance	5
	Interrelationships	14) Concept of ecology	1
		15) Food chains and food webs	2
		16) Associations in biological communities	4
		17) Humans and the natural environment	2
	Total	72	

Time allocation

BIOLOGY	Level 1	Level 2
		3 hours a week

NOTE: Throughout this Biology Syllabus, emphasis must be put on:

1) **Knowledge:**

- Knowledge of terminology.
- knowledge of specific facts.
- Familiarity with experiments suggested in the syllabus.

2) **Comprehension or understanding**

Ability to:

- explain standard phenomena from principles and models and to describe standard experiments met with before.
- translate between various forms of information presentation.
- draw conclusions from experimental procedures.

3) **Application and higher abilities (Skills, values and attitudes)**

Ability to:

- analyse presented information.
- synthesise ideas from the presented data or otherwise.
- apply laws and generalisations already learnt to everyday life and new situations.
- devise experiments to test hypotheses and statements of models.
- devise projects in which the products employ Biology principles.
- exercise evaluative judgement on suitability and results of scientific procedures.

4) **Practical skills**

Acquisition of the following abilities:

- Application of knowledge/theory to practical situations.
- Stating the appropriate experimental title or heading.
- Manipulation of the apparatus and performing experiments.
- Accurately making and recording observations in column tables.
- Presentation of data in an appropriate form, especially graphical, with properly labelled axes and using suitable scales.
- Drawing conclusions from observations made.
- Assessing the suitability of procedure, experiment and observations made in support of the conclusion.

Features of this new AEP Syllabus

This AEP Biology Teaching Syllabus has the following features:

a) **Competency**

This is a general statement of what a learner can exhibit/do as a result of learning all the concepts within each topic. It is stated at the top of the table for each topic in the detailed syllabus.

b) **Learning Outcomes**

These are the expected behaviours which a learner will exhibit after the study of the topic. The teacher must ensure that all the outcomes are achieved. They have been provided to help the teacher clarify content and scope. Where a higher outcome is stated, lower outcomes are implied.

The teacher should use learning outcomes to plan his/her teaching strategies. Learning outcomes also guide in evaluation at the end of the teaching and learning process. The Biology for AEP has some learning outcomes that are followed by information in brackets to guide the teacher on the boundaries of the scope for that particular learning outcome. For example (k) knowledge, (u) understanding, (s) skills, gs (generic skills and (v/a) values/attitudes.

c) **Duration**

This has been provided for each topic. Each period is one hour. The duration is meant to guide the teacher in planning so as to cover all the content appropriately. However, the number of periods should allow for flexibility in order to cater for remedial teaching and carrying out practical activities where possible.

d) **Suggested Learning Activities**

These provide the teacher with guidance, for example, on the tasks which the learners must accomplish to achieve the learning outcomes. However, these are not the only activities, since other tasks, as may be suggested by the teacher, must be used. The teacher should use an appropriate strategy, e.g. individual or group work, for learners to carry out the activities effectively. Teachers should also encourage learners to use a variety of resources, such as the library and ICT.

e) **Sample Assessment Strategies**

These are meant to test the level of understanding for each topic. However, other assessment strategies, as suggested by the teacher and textbooks, that are appropriate to the topic should be used to assess the learners' achievement. The sample assessment strategies are not meant to be spot work for end-of-cycle examinations but rather to assist the teacher in formative assessment. Some of this assessment is done by observation and can be used to assess attributes like teamwork, confidence, scientific literacy, communication, leadership and organisational skills in learners.

f) **Hints to the Teacher**

These further clarify the scope and depth of coverage for some topics. They should be taken seriously to avoid leaving out content or giving content beyond the scope of the learners.

g) **ICT integration**

This shows the ICT resources that the teacher should use to further the understanding of the different concepts. The teacher should note that these are optional and only applied where they are available.

The syllabus details for all subjects are set out in three columns:

LEARNING OUTCOMES	SUGGESTED LEARNING ACTIVITIES	SAMPLE ASSESSMENT ACTIVITIES
The knowledge, understanding, skills, generic skills, values and attitudes expected to be learned by the end of the topic	The sort of learning activities that include the generic skills that will help learners achieve the Learning Outcomes.	Opportunities for assessment within the learning for a given theme

Teachers should base their lesson plans on the Learning Outcomes using the Suggested Learning Activities as a guide. These are not the only possible learning activities; therefore, teachers are encouraged to extend these and devise their own that are appropriate to the needs of their learners.

LEVEL ONE: TERM 1

THEME: Diversity of Living Things

Topic 1: Introduction to Biology

Duration: 2 Hours

Competency: The learner understands Biology as a study of life and that all living organisms experience life processes

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to appreciate that:</p> <p>a) biology is the study of life. (k)</p> <p>b) biology is applied in everyday life. (u, v)</p> <p>c) life processes are common to all living things, but they are manifested differently in different organisms. (u)</p>	<p>i) In pairs, through a discussion, learners talk about their understanding of science and its components.</p> <p>ii) In pairs, learners discuss and report on their understanding of the term 'biology'.</p> <p>iii) In pairs, learners observe plants and animals, and identify characteristics that show that organisms are living. Identify, research and record the seven characteristics of living things.</p> <p>iv) Discuss which life processes are common to both animals and plants, and any that are different, and record conclusions in a clear table.</p>	<p>1) Listen and observe as learners explain orally or in writing the meaning of the word biology.</p> <p>2) Listen and observe as learners demonstrate orally or by completing a comparison table that they understand how animals and plants carry out nutrition, respiration, movement, excretion, growth and reproduction, and how they show sensitivity.</p> <p>3) Evaluate learner's responses and verbal feedback, including reports, and tables presented.</p>

Use Biology reference books to research information about life processes.

ICT Support: Use the Internet to research information about life processes.

Hint to the Teacher: The following branches of biology (botany, zoology, physiology, anatomy, genetics, ecology and taxonomy) should be discussed while teaching this topic.

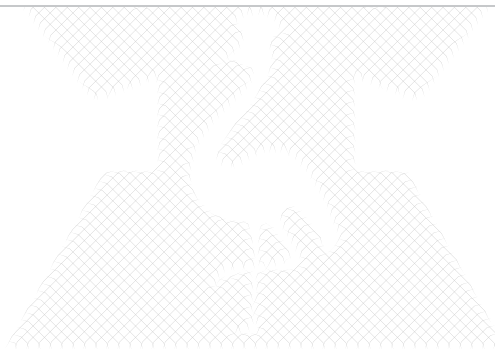
Topic 2: Cells

Duration: 4 Hours

Competency: The learner appreciates the cell as the basic unit of living organisms.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) describe that the basic unit of living organisms is a cell. (k)</p> <p>b) state the structure and functions of a typical animal cell and plant cell. (k, u, s)</p> <p>c) describe levels of organisation in organisms (cell, tissue, organ, system, organism). (u)</p>	<p>i) Observe prepared slides of plant and animal cells, draw cells and identify similarities and differences.</p> <p>ii) Draw and label the animal and plant cell as seen under a light microscope.</p> <p>iii) Research on the functions of the parts in a plant and animal cell, and annotate labels on cell diagrams accordingly.</p> <p>iv) In groups, learners brainstorm, research and list the different types of cells, tissues, organs and systems in the human body.</p> <p>v) In groups learners develop and present simulations showing how the organ systems need to work</p>	<p>1) Listen and observe as learners explain orally or in writing:</p> <ul style="list-style-type: none"> • similarities and differences between plant and animal cells. • structure and functions of cells, parts of cells. • different levels of organisation and their importance in large organisms. <p>2) Observe group simulations showing the organ systems.</p> <p>3) Involve class members in peer assessment and discussion of how groups could improve the quality of simulations.</p> <p>4) Evaluate quality of learners' illustrations relating to each activity mentioned above.</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
	together when a person is: <ul style="list-style-type: none"> i) dancing ii) eating iii) writing a story vi) Devise creative ways of explaining the five levels of organisation (from simple to complex) to the class.	
<p>ICT Support: The learner can use a suitable graphical programme to draw animal and plant cells.</p> <p>Hint to the Teacher: Ensure that specialised cells are emphasised in the respective topics in which they appear.</p>		



Topic 3: Classification

Duration: 14 Hours

Competency: The learner understands that organisms can be sorted and identified according to their characteristics.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>a) The learner should be able to:</p> <p>b) understand the concept of classification of organisms at different levels. (u)</p> <p>c) Identify the five kingdoms of living organisms, giving examples of organisms under each kingdom. (k)</p> <p>d) understand the value of microorganisms. (s, v)</p> <p>e) know examples of organisms from each of the following categories: vascular & non-</p>	<p>i) Learners consider the analogy of books being classified in a library.</p> <p>ii) Learners use an analogy of population sizes at different political administration levels in Uganda, e.g., district, county, sub-county etc., to compare with the number of organisms in a kingdom, phylum, class, order, family, genus and species. Learners give examples at each level and match the biological hierarchy with the ‘equivalent’ political administration level.</p> <p>iii) Learners use pictures (and possibly microscope slides) as well as lists of group characteristics to identify organisms as belonging to the following groups: Monera/bacteria, Protocista, Fungi, Plantae and Animalia.</p>	<p>1) Observe learners in groups as they develop and use identification keys.</p> <p>2) Listen to learners’ conversations and ask probing questions to check their understanding. Observe and listen to group presentations.</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>vascular, angiosperms & gymnosperms, monocots & dicots in kingdom Plantae. (No drawings required). (k)</p> <p>f) know the names with examples of organisms in the following phyla in kingdom Animalia (Platyhelminthes, Nematoda, Annelida, Mollusca Arthropoda and Chordata). (k) (Details of characteristics of Platyhelminthes, Nematoda, Annelida and Mollusca not required).</p> <p>g) identify and describe any 3 common characteristics of</p>	<p>iv) In groups, learners construct simple identification keys for grouping the organisms in the pictures, share their keys with other groups, and then use them to identify other examples of organisms belonging to the same groups.</p> <p>v) In groups, learners research and make summary write-ups on the use of bacteria and fungi in the production of yoghurt, cheese, bread and alcohol.</p> <p>vi) In groups, learners discuss, design and carry out an experiment to investigate the conditions required for the production of yoghurt. Groups write a formal report on the experiment (prediction, materials, procedure, record/analysis of results and conclusion) and present their reports to the rest of the class</p> <p>vii) In groups, learners go to the school compound/garden and study examples of members of kingdom Plantae belonging to the following</p>	<p>3) Evaluate quality of products such as keys, tables, experiment reports, diagrams and drawings.</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>phylum Arthropoda and classes; Insecta and Arachnida with examples. (No drawings required). (u)</p> <p>h) identify and describe any 3 common characteristics of phylum Chordata and classes; Pisces, amphibia, Reptilia, Aves, and Mammalia with examples. (No drawings and details of the reproduction process should be given). (u)</p> <p>i) construct a dichotomous key. (s)</p> <p>j) understand that viruses have characteristics similar to other</p>	<p>categories: vascular/non-vascular, angiosperms/gymnosperms, monocots/ dicots. Groups choose the format to use to present their findings (tables, drawings or more creative methods).</p> <p>viii) In groups, learners research to identify the names of the phyla in kingdom Animalia (Platyhelminthes, Nematoda, Annelida, Mollusca, Arthropoda and Chordata).</p> <p>ix) In groups, learners study pictures of organisms to identify common characteristics of arthropods and differences between members of the classes Insecta and Arachnida. Groups choose the format to use to present their findings (tables, drawings or more creative methods).</p> <p>x) Groups construct simple keys to place animals in the correct category.</p> <p>xi) In groups, learners research the common characteristics (see list in learning outcomes)</p>	

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>living organisms, and key differences. (u)</p> <p>k) know examples of viruses affecting plants and animals (Corona, HIV, Ebola, hepatitis, and cassava mosaic). (k)</p>	<p>and differences between examples of members of the five main classes of the phylum Chordata: fish, amphibians, reptiles, birds and mammals. Groups choose the format to use to present their findings (tables, drawings or more creative methods).</p> <p>xii) In groups, research common characteristics of viruses and some examples of viruses that affect plants and animals.</p> <p>xiii) Write and present a report on strategies for preventing these virus infections and the importance of doing so.</p>	
<p>Use Biology reference books to study images of various organisms and also find out the meanings of vascular, non-vascular, angiosperms and gymnosperms with regard to kingdom Plantae.</p> <p>ICT Support. The learner can use the Internet to:</p> <ul style="list-style-type: none"> • obtain images of living organisms and show how they are similar or different in a presentation or word processor. • find out the meanings of vascular, non-vascular, angiosperms and gymnosperms with regard to kingdom Plantae. <p>Hint to the Teacher: Use knowledge of plant and animal cells to compare the characteristics of organisms in the Plant and Animal Kingdom.</p>		

Topic 4: Insects

Duration: 6 Hours

Competency: The learner understands the characteristics of insects, relates structures to their functions in some common insects, and appreciates that insects have a direct or indirect effect on the well-being of other organisms.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) identify the observable external features of a housefly, cockroach and bee. (No details of mouth parts required). (k, s)</p> <p>b) appreciate the useful and harmful effects of a housefly, cockroach, mosquito, bee and butterfly. (u) (v)</p>	<p>i) In pairs, use a hand lens to observe a housefly, cockroach, mosquito, termite, bee and butterfly, paying specific attention to the following structures:</p> <ul style="list-style-type: none"> - head (mouth parts, antennae, eyes, hair); - thorax (wings, halteres, hairs, strips, legs and the different segments); and - abdomen. <p>ii) Pairs create a suitable table and record observations, comparing each of the insects.</p>	<p>1) Observe pairs carrying out activities and check that they identify the parts listed; create an appropriate comparison table; draw and label correctly; construct keys that work.</p> <p>2) Listen to conversations from each pair of learners and monitor understanding and progress</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
c) know the different methods of controlling the harmful stages of a mosquito. (u) (v)	iii) Pairs construct a dichotomous key for any four of the insects listed above. iv) Pairs research the different methods of controlling the harmful stages of a mosquito.	towards learning outcomes. 3) Evaluate the quality of products of each activity.

ICT Support: The learner can use a suitable graphical programme to present the dichotomous key.

Hint to the Teacher: For the life cycles of each of the insects, only give the duration of the whole cycle, not the duration of each stage of the cycle.



LEVEL ONE:

TERM 2

THEME: Diversity of Living Things

Topic 5: Flowering Plants

Duration: 5 Hours

Competency: The learner understands that different parts of flowering plants carry out different functions, and understands how the parts are suited to their functions.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to understand how the structures (roots, stems, leaves, flowers and fruits) of monocotyledonous and dicotyledonous plants are suited to their functions</p>	<p>i) In groups, learners go to the school compound/garden and compare the structural features (root system, leaf venation, leaf shape, leaf attachment to stem and flower colour) of a whole herbaceous dicotyledonous plant and whole monocotyledonous plant. Learners record their observations and present them to the class.</p> <p>ii) In groups or as a whole class, learners discuss how the structures observed in the two plants carry out their functions. Annotate the drawings made above to explain how each structure is suited to its function.</p>	<p>1) Observe groups carrying out activities, and check that they interpret specimens and identify functions correctly.</p> <p>2) Listen to groups conversations and monitor understanding and progress towards</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
	<ul style="list-style-type: none"> iii) In pairs, learners draw and label the parts of the flower. iv) In groups or as a whole class, learners discuss how each part of the flower is suited to its function, and annotate the drawing made above to explain how. v) Pairs observe a bean seed and a tomato or other fruit, and write down the similarities and differences. Learners present their findings. 	<p>learning outcomes.</p> <p>3) Monitor individuals' and groups' contributions to whole-class discussion.</p> <p>4) Evaluate the quality of products from activities.</p>

Learners include drawings in handwritten project reports.

ICT Support: The learner can use a digital camera to capture images to be used in a word-processed project report.



THEME: Soil

Topic 6: Physical and Chemical Properties of Soil

Duration: 7 Hours

Competency: The learner knows that different soil types are made of different components and the balance of these components determines the properties of the soil.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) identify the types of soil. (u, v)</p> <p>b) understand that different soil samples have different properties : water retention, drainage, capillarity and pH; learners conduct experiments to investigate these properties</p>	<p>i) In pairs or groups, learners collect and observe three different soil samples – clay, sand and loam, and:</p> <p>a) examine the dry soil samples. b) pairs/groups record their observations relating to the following characteristics:</p> <ul style="list-style-type: none"> • the colour of each soil sample; • the texture of each soil sample; and • the size of particles in each soil sample. <p>ii) Task groups of learners to design, perform and report on investigations to show: retention, drainage and capillarity in loam, clay and sandy soils. The report for each experiment should follow scientific methods.</p> <p>iii) In pairs, learners determine the pH of a soil sample and discuss the significance of their findings.</p> <p>iv) In pairs, learners discuss and explain the importance of air</p>	<p>1) Observe pairs/groups as they examine soil samples.</p> <p>2) Listen to conversations and ask questions to gauge and deepen learning.</p> <p>3) Evaluate products: records of characteristics of each soil type.</p> <p>4) Observe groups and pairs carrying out activities. Check that they plan investigations that will give meaningful results.</p> <p>5) Listen to pairs' discussions, and monitor understanding and their progress towards learning outcomes. Ask</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>. (u, s)</p> <p>c) understand the importance of air and water in soil to other living organisms . (u)</p>	<p>and water in soil to living organisms.</p> <p>v) Group Project Aim: To investigate whether crop growth is different in different soil types.</p> <p>Design and carry out an experiment using annual plants in soils with different percentages of contents, e.g. high clay content or high sand content.</p>	<p>probing questions to promote critical thinking and deepen learning.</p> <p>6) Evaluate the quality of products from activities: reports of investigations; conclusions relating to the impact of different properties on the quality of soil; explanations of the importance of air, water and humus, as well as the impact of soil types on crop yield and the reasons for it.</p>
<p>Learners can include drawings in the handwritten reports</p> <p>ICT Support: The learner can use a digital camera to capture images to be used in a word-processed experiment or report.</p> <p>Hint to the Teacher: The actual (quality) soil types should be used for experiments.</p>		

Topic 7: Soil Erosion and Conservation: Causes, Effects and Prevention

Duration: 4 Hours

Competency: The learner knows how and why soil fertility should be maintained for the soil to continue to be useful to living organisms.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <ul style="list-style-type: none"> a) know the features of fertile soil. (k) b) understand the process of and factors leading to soil erosion. (u) c) understand the causes of reduced soil 	<ul style="list-style-type: none"> i) In groups, learners discuss conclusions from Topic 6 and agree on a list of the features of fertile soil. Present their conclusions to the class. ii) In groups, learners visit a site where splash, rill, sheet and gully erosion have taken place and describe and explain what they have observed. Learners research the causes of soil erosion and the impact erosion has on communities. Produce a short presentation to show the types and the possible impact. iii) In groups, learners discuss what steps farmers and gardeners in their locality take to maintain soil fertility. Then let them research and write a report on the different methods used to maintain soil fertility and how to conserve it in the following regions of Uganda: 	<ul style="list-style-type: none"> 1) Through listening to group and whole-class discussions, assess learners' knowledge of the features of fertile soils, the causes and impact of soil erosion, and the steps taken to increase fertility and reduce erosion. 2) Observe group activities and check for their effective communication and ability to work as a team so that everyone is learning and developing skills. 3) Listen to the conversation of each pair and

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
fertility and describe methods of soil conservation. (u, v)	<ul style="list-style-type: none"> - Lake Victoria basin; - Kigezi Highlands; and - Karamoja region. iv) Group Project: Design, perform and write a report on an investigation into the formation of compost in a compost bin. Report on the process of composting, how fast different materials decompose, any organisms (decomposers) that seem to be involved in the process, and anything else significant or interesting.	monitor for progress towards learning outcomes. Intervene as appropriate to deepen learning. 4) Observe groups interacting and intervene as appropriate to steer research and project planning so that learning outcomes are achieved. 5) Evaluate quality of products: presentations and reports.
<p>ICT Support: The learner can use mind-mapping or word-processing software to relate methods of soil conservation to the principles that apply to them.</p>		

THEME: Nutrition in Plants and Animals

Topic 8: Nutrition Types and Nutrient Compounds

Duration: 6 Hours

Competency: The learner understands that organisms have different nutritional requirements, and that humans have different requirements, depending on age and other factors.

Learning Outcomes	Suggested Activities	Learning	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) understand the term 'nutrition'. (k, u)</p> <p>b) identify the food nutrients, their sources, and importance to humans. (u)</p> <p>c) perform food tests for various nutrients (only quality testing required). (s)</p> <p>d) appreciate the concept of a balanced diet in relation to age, sex and an</p>	<p>i) In groups, learners brainstorm the meaning of the term 'nutrition'. Share and agree on the meaning of the term with the rest of the class.</p> <p>ii) In groups or pairs, learners carry out tests on foods such as potato, egg yolk, milk, groundnuts and pineapple to determine what main food nutrients they contain.</p> <p>iii) In groups or as a whole class, learners discuss and report on: the meaning of the term 'balanced diet' and what this might</p>		<p>1) Observe groups and pairs carrying out activities. Check that they carry out tests and research effectively, and plan experiments that will give valid results.</p> <p>2) Listen to each group or pair's discussion and monitor understanding and progress towards learning outcomes.</p>

Learning Outcomes	Suggested Activities	Learning	Sample Assessment Strategy
<p>individual's activity. (u, v)</p> <p>e) appreciate the causes and effects of nutrient deficiency in humans, including diseases related to malnutrition. (u, s)</p>	<p>mean for a baby, a child, an adult woman and adult, an athlete, and an inactive person. They record their conclusions.</p> <p>the likely effects of an imbalanced diet.</p> <p>iv) Learners listen to a talk or write a short speech on self-esteem in relation to physical differences in body shape.</p>		<p>Ask probing questions to deepen learning.</p> <p>3) Evaluate the quality of products from activities: reports and conclusions from tests and investigations; presentations and explanations.</p>
<p>Learners use reference books to get information they use to develop a chart showing food groups and their sources.</p> <p>ICT Support</p> <p>The learner can:</p> <ul style="list-style-type: none"> • use mind-mapping or word-processing software to categorise food groups and their sources. • use the Internet to research malnutrition. 			

LEVEL ONE: TERM 3

THEME: Nutrition in Plants and Animals

Topic 9: Nutrition in Green Plants

Duration: 3 Hours

Competency: The learner understands that plants are autotrophic, carrying out photosynthesis to make complex food molecules from light energy, water and carbon dioxide.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) understand the meaning of autotrophic and heterotrophic nutrition. (k) derive the meaning of the term photosynthesis and understand the process. (u, s)</p>	<p>i) In pairs or groups, learners discuss, research and document:</p> <ul style="list-style-type: none"> • the meaning of autotrophic and heterotrophic nutrition; • why autotrophs are the providers of all food; • the origin and meaning of the term photosynthesis; and • the equation for photosynthesis and its implications regarding what plants need for photosynthesis. <p>ii) In groups learners examine diagrams, photographs or microscope slides of sections through a leaf and discuss how the structure is adapted so that cells can obtain the water,</p>	<p>1) Listen to discussion and ask probing questions to promote critical thinking and guide learners towards learning outcomes.</p> <p>2) Evaluate products: conclusions from the discussion and research; reports on experiments, findings about</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
b) appreciate the structures and adaptations that enable a leaf to carry out the process of photosynthesis. (k, u)	carbon dioxide, light and energy they need. iii) Groups share findings and through whole-class discussion agree on conclusions. iv) Group Project: Develop a simple 3D model of the internal structure of a leaf using locally available materials.	leaf structure, and 3D leaf models.

Learners use reference books to research photosynthesis.

ICT support. The learner can:

- use the Internet to research photosynthesis
- use data collection technology such as oxygen and carbon dioxide sensors to examine the products of photosynthesis.

Topic 10: Nutrition in Mammals

Duration: 10 Hours

Competency: The learner knows that animals are heterotrophic; obtaining their nutrients from existing plant or animal sources.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) understand the role of enzymes in influencing life processes; and appreciate that the working of enzymes may be affected by different factors. (No details of lock-and-key mechanism required). (u, s)</p>	<p>i) In groups, learners research and discuss the effects of enzymes on chemical reactions, list the properties of enzymes, and the names and functions of some enzymes, that work in the human digestive system.</p> <p>ii) Produce a presentation to explain findings.</p> <p>iii) In groups, research the effect of pH and temperature on enzyme activity.</p> <p>iv) In pairs, learners observe a molar, canine, pre-molar and incisor tooth and identify:</p> <ul style="list-style-type: none"> • the common structural features of each of the teeth in a mammal; and • the adaptations of each type of tooth to its function. <p>v) Learners make an accurate labelled drawing of each tooth and state the magnification.</p> <p>vi) In pairs, learners share experience and research the reasons for and methods of ensuring dental hygiene as well as the consequences of poor</p>	<p>1) Observe groups carrying out research and experiments to check that engagement in skills development and experiment designs is appropriate for achieving learning outcomes. Steer learners towards learning outcomes if necessary</p> <p>2) Listen to, and engage in group conversations</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>b) understand the effect of pH and temperature on enzyme activity. (u)</p> <p>c) know and identify different types of mammalian teeth, and relate their structure and position in the jaw to diet. (k, u, s)</p> <p>d) understand the importance of oral hygiene, and describe good practice in caring for teeth and</p>	<p>hygiene. Produce a short good practice guide.</p> <p>vii) In pairs, learners research and write the dental formula for a herbivore, a carnivore and an omnivore.</p> <p>viii) In pairs, learners observe an unlabelled chart and, through discussion and research, identify and name the parts of the alimentary canal and associated organs, labelling the parts and adding their functions.</p> <p>ix) Guide learners in groups to design a controlled experiment to determine what substances are digested in the mouth:</p> <ul style="list-style-type: none"> • include the hypothesis; • describe the experimental design; • indicate the control group(s); and • describe the results of the test. <p>x) In groups, learners simulate the process of digestion, its products and their absorption using either:</p> <ul style="list-style-type: none"> • labelled cards with names of parts of the alimentary canal and different food types; • strings of beads that can be linked and unlinked; and • role-play (holding hands to form 	<p>and ask probing questions to check and guide progress towards learning outcomes.</p> <p>3) Evaluate quality of products: findings on role of enzymes; explanation of effect of pH and temperature on the rate of reaction; clarity of drawings; accuracy and creativity of presentations ; drawings; guide and dental formulae;</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>gums in humans. (u, v)</p> <p>e) appreciate the structure of the different parts of the mammalian alimentary canal, and its role in the digestion of food. (k, u)</p> <p>f) understand how the end products of digestion are absorbed and assimilated. (u)</p>	<p>long chain molecules, releasing hands when ‘digested’ to become small sub- units that can be absorbed).</p> <p>xi) Learners produce annotated diagrams to explain their understanding of digestion and absorption.</p> <p>xii) Use a variety of methods (e.g. involving a food scientist, book and Internet research, and animations) to enable learners to understand the meaning of assimilation and how the body uses each of the following nutrients:</p> <ul style="list-style-type: none"> • carbohydrates; • lipids; • proteins; • mineral salts; and • vitamins. <p>xiii) Learners document their findings in a mind map or spider diagram</p>	<p>experiment reports, simulations, mind maps/spider diagrams, descriptive reports</p>

Learners use Biology reference books to study enzymes and their roles in life processes.

ICT Support

The learner can use the Internet to study enzymes and their roles in life processes.

THEME: Transport in Plants and Animals

Topic 11: Transport in Plants

Duration: 4 Hours

Competency: The learner appreciates how substances enter and exit from cells and knows the transport processes in plants, the structures involved, and their functions.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) understand the importance and key methods of movement of materials into and out of cells. (u)</p> <p>b) understand the processes of transpiration and translocation. (u)</p>	<p>i) In pairs, learners observe a tea bag in a clear glass container of still warm water for five minutes, then discuss and explain their observations. Whole-class discussion leads to understanding of the process of diffusion.</p> <p>ii) In groups, learners use scientific process skills to design and carry out an experiment to show the effect of solutions of different concentrations on raw unshelled eggs and raw potatoes.</p> <p>iii) Groups discuss and draw conclusions to explain their results. Individuals write reports at the end of the experiment that include the following: title, question, prediction, materials, procedure, record / analysis of results and conclusion. Groups present their work to the rest of the class.</p> <p>iv) In groups, learners discuss and research the meanings of diffusion, osmosis and active</p>	<p>1) Observe pairs and groups carrying out activities. Check that they understand how to use resources effectively, take due account of prior learning, use research skills well, and plan valid experiments.</p> <p>2) Listen to pairs of learners and group discussions, monitor progress towards learning outcomes and ask questions to help learners develop skills and deepen understanding.</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
	<p>transport, as well as the circumstances in which each is involved in the entry and exit of substances to and from cells. Groups present conclusions in a comparison table.</p> <p>v) In pairs, learners consider what they know about leaf structure, transport vessels in stems, roots and root hairs, and connect their learning to explain how the process of transpiration takes place. Individuals produce an annotated diagram to explain the process.</p> <p>vi) In pairs or groups, while carrying out the ringing experiment of one of the plants in the school compound, learners use their observations to understand the need for, and the meaning of, translocation in plants. Share findings with the class before learners go on to explain in notes and diagrams.</p>	<p>3) Evaluate the quality of products from activities: report on root hairs; transpiration diagram; translocation, and investigations of conditions affecting transpiration rates.</p>

Learners make a handwritten report on their investigations of the osmotic flow of water through plant material.

ICT Support

Learners can use any word processor to prepare an activity report on their investigations of the osmotic flow of water through plant material.

Hint to the Teacher: Cover the basic principles of diffusion, osmosis and active transport ONLY.

Topic 12: Transport in Animals

Duration: 7 Hours

Competency: The learner appreciates that animals have special systems for the efficient transport of materials around their bodies, and understand the principles of how these systems operate.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) understand the principle of the surface area to volume ratio. (s)</p> <p>b) know the need for a transport system, and identify the components involved in the transport system in mammals. (k)</p> <p>c) describe the structure of the heart and how it functions. (u, s)</p> <p>d) understand how the structures of</p>	<p>i) In pairs, learners use cubes of different dimensions to calculate the surface area to volume ratios of the cubes, then discuss and explain the biological significance of calculated ratios.</p> <p>ii) In pairs, learners discuss what they already know about the components of their circulatory systems.</p> <p>iii) In pairs, learners discuss the structure and function of the heart, referring to diagrams and a model. Pairs share their thoughts in groups or in a whole-class discussion.</p> <p>iv) Learners draw and label the parts of a mammalian heart, adding clear notes relating to function.</p> <p>v) In groups, learners design a model, visual aid, animation or drama to</p>	<p>1) Listen to pairs of learners and group conversations and a whole-class discussion to monitor progress towards learning outcomes. Intervene as appropriate to ensure all understand and to deepen learning.</p> <p>2) Observe pairs and groups carrying out activities; check that all contribute so</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>blood vessels are related to their function by comparing arteries, veins and capillaries. (u, s)</p> <p>e) identify the major functions of blood, and relate the functions to the components of blood. (u, s)</p> <p>f) understand the importance of knowledge of blood groups in blood transfusion. (k, u, v)</p>	<p>illustrate blood flow/circulation in the human body and present to the class.</p> <p>vi) In pairs, learners research the structures of arteries, capillaries and veins, and produce tables, models or diagrams to show how structure is related to function in each case.</p> <p>vii) In pairs, learners research the components of blood and their functions and produce a table summarising their findings to share with the class.</p> <p>viii) Learners watch a video clip or listen to a talk from blood bank personnel to find out the importance of blood transfusion and the possible risks involved. In pairs, learners complete a short report on the benefits and risks of transfusions, including compatible blood groups.</p>	<p>that everyone is learning and developing skills. Steer progress towards learning outcomes.</p> <p>3) Evaluate the quality of products of each activity: annotated diagrams, presentations, summary tables, reports and role-play.</p>

Hint to the Teacher: Immunity should be discussed under the components of blood.

LEVEL TWO

TERM 1

THEME: Respiration in Plants and Animals

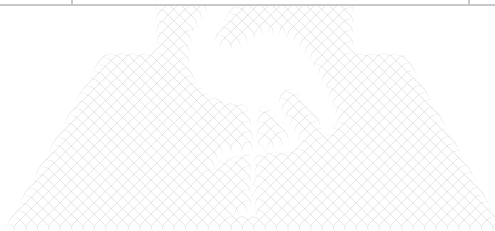
Topic 1: Gaseous Exchange

Duration: 6 Hours

Competency: The learner knows the functions of, and is able to recognise the similarities and differences of, gas exchange surfaces in different organisms.

Learning Outcomes	Suggested Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) appreciate the need for a gaseous exchange system in a multicellular organism. (u)</p> <p>b) identify adaptations of gas exchange surfaces. (u)</p> <p>c) understand the structure of the human respiratory system, and explain the mechanism of gaseous exchange in humans. (u, s)</p>	<p>i) In pairs, learners think about their prior learning of surface area to volume ratios. Explain verbally or on paper why multicellular organisms need specialised systems for gaseous exchange.</p> <p>ii) Learners draw and label the structure of the human respiratory system.</p> <p>iii) In pairs, learners use models to explain the mechanism of gaseous exchange in humans and share models with/explain models to the class.</p>	<p>1) Listen to pairs of learners and group discussions and ask probing questions to promote critical thinking and deepen understanding.</p> <p>2) Observe groups as they interact and examine specimens, research or use models. Help as appropriate to set up experiments correctly and</p>

Learning Outcomes	Suggested Activities	Learning	Sample Assessment Strategy
d) understand the dangers of smoking and air pollution to gas exchange surfaces in the lungs. (u, v/a)	iv) In groups, learners design, perform and report on an experiment to demonstrate the tar in cigarette smoke that is so damaging to the gas exchange surfaces in the lungs. v) Design a poster for secondary school students to put them off smoking tobacco and marijuana.		guide them towards learning outcomes. 3) Evaluate the quality of products: clarity of explanations and drawings; models and group reports; accuracy and creativity of presentations and posters.



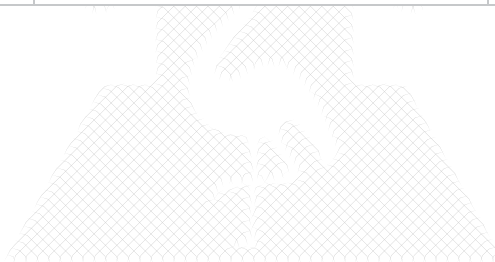
Topic 2: Aerobic and Anaerobic Respiration

Duration: 6 Hours

Competency: The learner appreciates that the energy living organisms use is obtained from food through aerobic or anaerobic respiration.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) appreciate the importance of the process of respiration (both aerobic and anaerobic). (u)</p> <p>b) understand and outline the process of aerobic respiration. (u)</p> <p>c) appreciate the relationship between plants and animals in relation to aerobic respiration and photosynthesis. (s, gs)</p>	<p>i) In pairs, learners discuss the importance of respiration and the consequence of respiration failing to occur.</p> <p>ii) In pairs, learners research on and write the word and symbol equations for aerobic respiration, and the site in cells where this takes place.</p> <p>iii) In groups, learners use scientific process skills to design and carry out experiments to show the release of energy, production of carbon dioxide and water, and the use of oxygen during aerobic respiration. Report to class on process and findings.</p> <p>iv) Class debate about: ‘Plants and animals can live and survive entirely independent of each other’.</p> <p>v) In groups, learners design and carry out experiments to show:</p>	<p>1) Observe pairs of learners/group interactions and experiments, and assist where necessary, to ensure progress towards learning outcomes.</p> <p>2) Listen to learners’ discussions and debates. Probe to promote critical thinking, understanding and skills development.</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>d) understand and outline the process of anaerobic respiration. (u)</p> <p>e) understand some applications of anaerobic respiration in everyday life (u)</p> <p>f) compare aerobic with anaerobic respiration (s)</p>	<ul style="list-style-type: none"> • fermentation using yeast; and • anaerobic respiration in germinating seeds. <p>vi) Share groups' reports on outcomes.</p> <p>vii) In groups, learners design and give a presentation to explain the applications of anaerobic respiration in everyday life.</p> <p>viii) Individually, learners complete a comparison table for the two types of respiration.</p>	<p>3) Evaluate the quality of products: explanations, reports, discussion and debate, equations, presentations and comparison tables.</p>



THEME: Excretion

Topic 3: Excretion in Animals

Duration: 4 Hours

Competency: The learner understands that different organs excrete different waste products, and is able to relate the organs of excretion in the human body to their functions.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learners should will be able to:</p> <p>a) understand the need to remove unwanted substances from the bodies of living organisms. (u)</p> <p>b) describe the process of excretion in humans, including the loss of waste products in sweat, urine and through breathing. (k, u)</p>	<p>i) In pairs, discuss the waste products that organisms need to excrete, and the implications for living cells if they were not able to remove them. Share conclusions in whole-class discussion.</p> <p>ii) Distinguish between waste products and undigested waste (faeces).</p> <p>iii) In groups, learners examine a dissected mammal or a diagram/video of one. Learners observe and identify the organs associated with excretion and record their observations.</p> <p>iv) In groups, learners research the functions and processes that take place in the kidneys, and create a simulation explaining the processes of ultrafiltration and re-absorption.</p>	<p>1) Observe groups interacting and intervene when necessary to ensure that activities are leading to learning outcomes being achieved.</p> <p>2) Listen to learners' conversations/discussions and ask questions to monitor progress and understanding. Intervene to offer guidance as appropriate.</p> <p>3) Evaluate the quality of products: oral contributions to the discussions, reports, simulations and verbal explanations.</p>

Hint to the Teacher: Remind learners that excretion takes place in all living organisms including lower organisms and plants.

THEME: Coordination in Animals

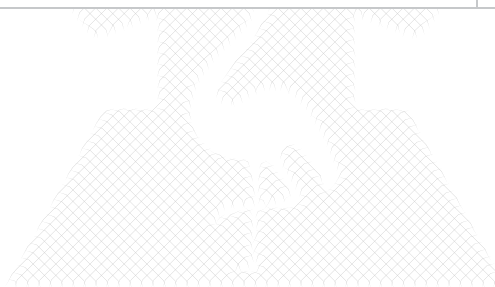
Topic 4: Chemical Coordination in Humans

Duration: 6 Hours

Competency: The learner appreciates that there are organs in the body that secrete chemicals called hormones, which play vital roles in coordinating body functions.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) know and understand the effects of various hormones in the human body. (k, u)</p> <p>b) know and describe the causes and symptoms of common hormonal disorders/diseases (diabetes and goitre)</p>	<p>i) In pairs, learners research and discuss the meaning of hormones.</p> <p>ii) Learners use a chart of the endocrine system to locate the different endocrine glands, and to note the hormones they produce and their effects.</p> <p>iii) Role-play: Learners pick cards labelled with the names of either endocrine glands, the hormones secreted by the glands or the target organs, and simulate the movement of the hormones from the glands to the target organs, giving descriptions of their effects on the target organs.</p> <p>iv) In groups, learners discuss and report on the role of hormones in</p>	<p>1) Observe pairs and groups engaging in activities. Intervene as necessary to ensure that all are participating and making progress with each task towards learning outcomes.</p> <p>2) Listen to learners' discussions and ask questions to encourage</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>in humans. (k, u)</p> <p>c) appreciate the role of diet in managing hormonal disorders/diseases in humans. (u, v)</p>	<p>the regulation of reproductive and sexual functioning in adolescent boys and girls, particularly the development of secondary sexual characteristics.</p> <p>v) In groups, learners discuss and produce a chart showing the causes and symptoms of diabetes and goitre.</p> <p>vi) In pairs, learners research and develop a one-day meal plan for a person suffering from diabetes.</p>	<p>creativity and critical thinking. Ensure all learners grasp concepts and understand.</p> <p>3) Evaluate the quality of products: oral contributions, charts, role-play, reports and meal plans.</p>



Topic 5: Nervous Coordination in Humans

Duration: 5 Hours

Competency: The learner appreciates that nerve impulses are forms of communication between receptor and effector organs and that impulses are affected/interrupted by chemicals found in drugs and alcohol.

Learning Outcomes	Suggested Activities	Learning	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) understand how the nervous system (brain, spinal cord and nerves) extends to all parts of the body and has sensory and motor functions. (u)</p> <p>b) understand the concept of reflex action and give examples of reflex action. (k, u)</p> <p>c) differentiate between voluntary and involuntary</p>	<p>i) In pairs, learners discuss what they know about the nervous system and its components, then research and discuss the meaning of sensory and motor functions. Pairs share their conclusions in a class discussion.</p> <p>ii) Individuals draw a sketch of a human being showing how the brain is connected to the spinal cord and nerves.</p> <p>iii) In pairs, learners test each other's 'knee jerk' reflex and discuss whether this is a voluntary or involuntary response.</p> <p>iv) Pairs contribute to a discussion of findings and the benefits of involuntary reflex actions and give examples of other reflex</p>		<p>1) Observe and listen to learners working in pairs, and intervene to ensure learning outcomes are being achieved.</p> <p>2) Evaluate the quality of sketches, contributions to class discussion, and annotated diagrams.</p> <p>3) Listen to learners' discussions and observe interactions to check that all are participating and developing</p>

Learning Outcomes	Suggested Activities	Learning	Sample Assessment Strategy
<p>responses. (u)</p> <p>d) know the common substances and drugs abused in Uganda and understand the physiological, social and economic effects of substance and drug abuse. (k, u)</p> <p>e) understand how to prevent, control substance and drug abuse. (u, v, gs)</p>	<p>actions.</p> <p>v) Individuals produce annotated diagrams of a reflex arc showing functions of parts.</p> <p>vi) In groups, learners discuss the physiological, social and economic effects of drug and substance abuse (alcohol, cigarettes, marijuana, kuber, khat, shisha, and petrol/glue).</p> <p>vii) Groups write strategies for a campaign for the avoidance, prevention and control of drug abuse in schools and communities; design posters that communicate the key messages.</p>	<p>produce</p>	<p>their understanding of the issues.</p> <p>4) Ask probing questions to promote critical thinking and creativity in the search for solutions to include in strategy posters.</p> <p>5) Evaluate quality of posters.</p>

Learners collect data from nearby health centres or newspapers and use it to plot graphs showing drug and substance abuse in Uganda.

ICT Support

Learners use the Internet to collect figures on drug and substance abuse in Uganda and analyse the data using spreadsheets.

LEVEL TWO TERM 2

THEME: Coordination in Animals

Topic 6: Receptor Organs in Man

Duration: 2 Hours

Competency: The learner appreciates that the sensory organs (eye and ear) detect stimuli, and enable the body to respond and function properly.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) understand the roles and functions of the human eye and ear as sense organs. (u)</p> <p>b) understand what short-sightedness and long-sightedness are and how they can be corrected. (u, s, v)</p>	<p>i) In pairs, learners explore and discuss the external features of the eye and diagrams of a cross-section. Draw the structure and write notes on the functions of each part.</p> <p>ii) Learner's research short- and long-sightedness by visiting a health facility, having a visit from an ophthalmologist, or using other resources. Learners write a report, including diagrams, to show how to correct the problems.</p> <p>iii) In pairs, learners explore and discuss the external features of the ear and diagrams of a cross-section. Draw the structure and write notes on the functions of each part.</p>	<p>1) Observe pairs' interactions and understanding demonstrated by diagrams and notes. Intervene to ensure progress towards learning outcomes.</p> <p>2) Listen to learners' discussions and probe to promote critical thinking and deepen learning.</p> <p>3) Evaluate quality of annotated diagrams and reports.</p>
<p>Learners use Biology reference books to research the eye and ear.</p> <p>ICT Support The learner can use the Internet to research the eye and ear.</p>		

THEME: Locomotion in Animals

Topic 7: Locomotion in Mammals

Duration: 4 Hours

Competency: The learner understands how muscles and the skeleton interact to produce movement in mammals.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) understand the structure and functions of the skeleton in supporting the human body. (ku)</p> <p>b) identify and describe the bones that form the</p>	<p>i) In groups, learners research the structure of the human skeleton using a 3D model, their own bodies, diagrams, animations and other online resources in order to:</p> <ul style="list-style-type: none"> • identify the two divisions of the skeleton; • name the bones that form the appendicular and axial skeleton; and • identify the regions of the axial skeleton. <p>ii) Draw and label examples of cervical, thoracic and lumbar vertebrae.</p> <p>iii) Identify the parts for muscle attachment on the vertebrae.</p> <p>iv) Working in pairs, learners use their bodies to identify movable parts and the plan in which the movement occurs at each joint. They produce a table</p>	<p>1) Observe pairs and groups engaging in activities and carrying out experiments to ensure involvement and the productive use of time leading to appropriate learning.</p> <p>2) Listen to learners' conversations and contributions to class discussion and ask probing questions to encourage critical thinking and progress towards learning outcomes.</p> <p>3) Evaluate the quality of explanations, research findings, experiment reports,</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>two divisions of the human skeleton . (k, u, s)</p> <p>c) understand how the action of muscles on the skeleton causes' movements in animals. (u, s)</p>	<p>naming the joints and the type of movement that occurs at each.</p> <p>v) In pairs, learners observe each other moving the forearm up and down (bending the arm at the elbow). Learners identify the set of muscles that bring about each movement and research the name of the muscles responsible for lifting and for extending the arm. Pairs produce an annotated diagram explaining their conclusions.</p> <p>vi) Project: In pairs, learners research the structure of any flexible joint. Develop a model or draw an annotated diagram to explain its structure and function.</p>	<p>and written/ drawn explanations.</p> <p>4) Observe pairs of learners engaging in activities and offer advice to overcome any barriers to learning.</p> <p>5) Listen to learners' discussions and ask questions to promote critical thinking and boost progress towards learning outcomes.</p> <p>6) Evaluate the quality of learning through products: tables, diagrams, models and leaflets.</p>
<p>Learner develops a chart showing the categories of joints in the human body.</p> <p>ICT Support</p> <p>The learner can use mind-mapping or word-processing software to categorise the different types of joints in the human body.</p> <p>Hint to the Teacher: Functions of skeleton limited to: protection, muscle attachment, manufacture of blood cells, support and provision of body framework, with a brief illustration of example(s) in each case.</p>		

THEME: Growth and Development in Plants and Animals

Topic 8: Growth in Plants and Animals

Duration: 4 Hours

Competency: The learner understands how, throughout its life, an organism goes through changes in size.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) distinguish between the term's 'growth' and 'development'. (u)</p> <p>b) appreciate that mitosis leads to increase in size and weight in animals. (u, s)</p> <p>c) conduct experiments on conditions necessary for seed germination. (s)</p>	<p>i) In groups, learners observe/examine young and mature plants and animals (including some that metamorphose) in the school compound or surrounding communities. Discuss and derive the meaning of the term's 'growth' and 'development' and share conclusions with the class.</p> <p>ii) In pairs, learners examine data from growth cards of five babies, draw growth curves and make deductions from the graphs.</p> <p>iii) In groups, learners role-play the process of mitosis using cards showing the different stages (names of stages not required), and show role-play to the class.</p>	<p>1) Observe pairs of learners and groups and ensure that they are making progress towards achieving learning outcomes. Steer them as appropriate.</p> <p>2) Listen to learners' conversations and ask questions to ensure that they all engage, think critically and grasp concepts of growth, development and mitosis.</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
d) identify the roles of water, oxygen and temperature in the process of germination. (u)	iv) In groups or pairs, learners discuss and explain verbally or in writing, the importance of mitotic cell division in living organisms. v) In groups, learners use scientific process skills to design, carry out and report on an experiment to investigate whether air and water are necessary for germination, and the effect of temperature on germination.	3) Evaluate the quality of verbal and written reports, experiment reports, observations shown in drawings and project report. 4) Involve class in peer assessment of role-play.
<p>Learners use graph books to draw graphs showing changes in height of a germinating seed over time.</p> <p>ICT Support</p> <p>The learner can use data-processing software to show changes in the height of a germinating seed over time.</p>		

Topic 9: Development in Plants and Animals

Duration: 5 Hours

Competency: The learner understands that organisms develop specialised cells, tissues and organs as they grow, leading to changes in structure and function.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) understand the need for differentiation of cells as multicellular plants and animals grow. (u).</p> <p>b) know the meaning of the term ‘metamorphosis’, and compare complete and incomplete metamorphosis. (k, u, s)</p>	<p>i) In groups, learners discuss the need for cells to become specialised as animals and plants grow, considering the different types of cells in their own bodies and in plants they can see in the locality. Groups share conclusions in a whole-class discussion and agree on a definition of cell differentiation.</p> <p>ii) Learners observe video clips of complete and incomplete metamorphosis, or research using different sources. In pairs, learners produce a table comparing the two types.</p> <p>iii) Individuals produce drawings to show the stages of each type of metamorphosis in insects.</p>	<p>1) Observe pairs and groups involved in activities to ensure that all are involved (taking into account that this unit involves a discussion of sensitive issues), and making good use of resources and time.</p> <p>2) Listen to pair and group conversations and contributions to the class discussion.</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>c) understand the life cycles of a housefly and cockroach.</p> <p>d) recognise and compare the main characteristics of stages of human development from birth to adulthood, including the developmental stages of a child (physical, behavioural, and cognitive). (ks)</p>	<p>iv) In pairs, learners research and produce life cycle diagrams for the housefly and cockroach, annotating diagrams to illustrate the type of metamorphosis each undergoes.</p> <p>v) In groups, learners observe drawings, animations or other sources and discuss the stages of human development.</p> <p>vi) In a whole-class discussion, key points about stages of development are shared.</p> <p>vii) In groups, learners research physical, physiological, psychological/emotional and behavioural changes associated with adolescence and puberty.</p>	<p>Ask probing questions to encourage learners to engage with sensitive topics so that all make progress and achieve learning outcomes.</p> <p>3) Evaluate the quality of products: oral feedback, notes, drawings, diagrams and reports.</p>
<p>Learners use Biology reference books to research body changes.</p> <p>ICT Support</p> <p>The learner can use the Internet as a source of research information on body changes</p>		

THEME: Reproduction in Organisms

Topic 10: Asexual Reproduction in Plants (Vegetative Reproduction)

Duration: 2 Hours

Competency: The learner appreciates that some parts of a plant can develop into new independent plants.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) know and understand how plants reproduce asexually. (k, u)</p> <p>b) understand that asexual reproduction in plants has important commercial applications. (k, u)</p>	<p>i) Learners carry out a field study to observe plants, identifying possible parts that have been or could be used to get new plants of the same kind. Learners report findings in a table with drawings as appropriate</p> <p>ii) In groups, learners visit the school garden and research and discuss the crops in Uganda that are grown by vegetative reproduction and produce a report.</p> <p>iii) Group project: Grow plants in school by, for example, layering (strawberries), stem cutting (cassava), and root cuttings, as well as grafting (citrus).</p> <p>iv) Groups research and report the key principles underlying each method of propagation used and possible reasons for success (or failure).</p>	<p>1) Observe groups engaging in activities and carrying out the project to ensure effective and productive use of time leading to learning outcomes.</p> <p>2) Listen to learners' conversations and contributions to the class discussion. Ask questions to encourage critical thinking and promote progress towards learning outcomes.</p> <p>3) Evaluate the quality of reports, research findings, project report, and comparison table.</p>

Topic 11: Sexual Reproduction in Plants

Duration: 5 Hours

Competency: The learner understands that the flower is the specialised organ in which all events of a plant's sexual reproduction occur, leading to the formation of an embryo located in the seed.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learners should be able to:</p> <p>a) recognise the flower structures that are involved in the processes of pollination, fertilisation, fruit and seed development and outline their functions. (k, u, s)</p> <p>b) know the processes of pollination, fertilisation and fruit formation. (u)</p> <p>c) understand the importance of</p>	<p>v) In groups or pairs, learners examine specimens and/or diagrams of insect-pollinated flowers, research using different sources, and then discuss:</p> <ul style="list-style-type: none"> • the meaning of the term 'pollination' and how pollination takes place; • how fertilisation takes place; and • how seeds and fruits develop. <p>vi) Individuals produce annotated diagrams explaining these processes.</p> <p>vii) In groups or pairs, learners visit the school compound/garden and examine examples of flowers that are wind-pollinated (e.g., maize, grasses) and some that are insect-pollinated, and compare the two, especially the stamens/anthers and</p>	<p>1) Observe pairs and groups carrying out activities. Ensure that all individuals are participating and understanding lessons emerging from examination of specimens, diagrams and research; making progress with each task towards learning outcomes.</p> <p>2) Listen to learners' conversations and ensure that all learners</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>dispersal.</p> <p>d) recognise the structures and types of fruits and seeds and relate their structures to their methods of dispersal. (u, s)</p>	<p>stigmas of each, relating structure to function. Learners then compare images or microscope slides of pollen grains from wind- and insect-pollinated flowers, again relating structure to function.</p> <p>i) Individuals produce a table/report comparing the two types of flowers and pollen.</p> <p>ii) In pairs, learners examine specimens and/or diagrams of fruits and seeds and discuss and explain (verbally and in notes) how different seeds are dispersed, stating why dispersal is so important.</p>	<p>grasp concepts and understand all processes set out in the learning outcomes.</p> <p>3) Evaluate quality of learning through products: annotated diagrams, tables and reports, verbal and written explanations.</p>

Learners develop a chart showing categories of fruits and seeds.

ICT Support. The learner can

- use graphical software to draw a labelled diagram of a local flower.
- use mind-mapping or word-processing software to categorise fruits and seeds by their structure.

LEVEL TWO

TERM 3

THEME: Reproduction in Organisms

Topic 12: Sexual Reproduction in Human

Duration: 9 Hours

Competency: The learner understands that sexual reproduction involves two parents with specialised reproductive systems.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) understand the structure and functions of the male and female reproductive system in humans. (k, u, s)</p> <p>b) understand the menstrual cycle (details of hormonal changes not required). (u)</p> <p>c) relate male and female gametes. (u)</p> <p>d) understand the importance of antenatal medical care. (u, s)</p> <p>e) understand aspects of care for</p>	<p>i) In pairs or groups, learners examine chart(s) of male and female reproductive systems, draw and label them, researching and annotating diagrams with the functions of each part.</p> <p>ii) In groups, learners make research to explain the events of the menstrual cycle.</p> <p>iii) In pairs or groups, learners research and describe (verbally and in notes):</p> <ul style="list-style-type: none"> the structure of male and female gametes, and functions of the parts; and the process of fertilisation. <p>iv) In groups, learners research, brainstorm and report on:</p> <ul style="list-style-type: none"> care for the baby after birth (breast-feeding, balanced 	<p>1) Observe pairs and groups engaging in activities. Intervene as necessary and encourage all to participate despite the sensitive nature of some topics. Ensure that all understand the importance of achieving learning outcomes for personal as well as school-related reasons.</p> <p>2) Listen to learners' discussions and</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>the baby after birth (breast-feeding, balanced diet, immunisation and hygiene). (u)</p> <p>f) recognise the health risks/complications associated with early/teenage pregnancy and abortion. (u, v)</p> <p>g) identify the common birth control methods in Uganda and give the biological principle they employ and their effectiveness. (Note: The only method recommended for young people is abstinence). (u, v)</p> <p>h) Identify common issues associated with reproductive systems. (u, s)</p>	<p>diet, immunisation and hygiene); and</p> <ul style="list-style-type: none"> • the importance of good antenatal medical care for mother and baby. <p>v) Learners visit a health facility, listen to a visiting professional and, in groups, carry out research on:</p> <ul style="list-style-type: none"> • the common birth control methods used in Uganda, the biological principle they employ and their effectiveness; and • dangers associated with early/teenage pregnancy and abortion. <p>vi) Individuals produce reports/posters explaining the above two points.</p> <p>vii) As individuals or in groups, learners find out the common menstrual and erectile abnormalities in young people and the possible medical remedies.</p> <p>viii) Learners listen to a talk from a health worker or watch a video clip about common STIs (see list</p>	<p>ask questions to encourage creativity and critical thinking.</p> <p>Ensure that all learners grasp all concepts.</p> <p>3) Evaluate learning as shown by the quality of products: oral contributions, annotated diagrams, reports and posters.</p> <p>4) Observe learners engaging in activities. Intervene as necessary to ensure that all are participating in pair/group discussion of sensitive issues. Check that all</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>i) know the causes, signs and symptoms and understand the mode of transmission of named STIs (syphilis, candida, and HIV/AIDS). (k, u, v)</p> <p>j) appreciate the preventive measures for the named STI's. (Note: The ONLY preventive method recommended for young people is abstinence). (u)</p> <p>k) identify the challenges faced by people living with HIV/AIDS and how to overcome them. (u, v)</p>	<p>under learning outcomes), and write a report that includes the following:</p> <ul style="list-style-type: none"> • causes and mode of transmission; • signs and symptoms; and • preventive measures. <p>ix) Learners listen to or recite the song “Alone and Frightened” by Philly Bongoley Lutaya.</p> <p>x) In groups or as a whole class, learners discuss the stigma/discrimination portrayed in the song, and the significance of the song in Uganda.</p> <p>xi) Groups write a short play about HIV/ AIDS and attitudes to sufferers.</p>	<p>are making progress with each task towards achieving learning outcomes.</p> <p>5) Listen to learners’ discussions. Ask probing questions to encourage learners to develop deep understanding of all key issues, and to be sensitive in relation to HIV/AIDS.</p> <p>6) Evaluate the quality of products: oral contributions, reports and plays.</p>

THEME: Genetics

Topic 13: Inheritance

Duration: 5 Hours

Competency: The learner appreciates that transmission of characteristics is from parents to offspring through a process and that variation is as a result of changes in the genetic make-up of an organism.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) describe the process of cell division and significance of meiosis. (k, u)</p> <p>b) understand the concept of inheritance using genetic diagrams. (u, s)</p> <p>c) understand and explain sex determination in</p>	<p>i) In groups or pairs, learners view an animation on meiotic cell division. Research using other sources, and then:</p> <p>ii) identify the stages and describe what occurs at each phase using annotated diagrams and notes; and</p> <p>iii) explain (verbally and in notes) the significance of meiotic cell division in maintaining the chromosome number.</p> <p>iv) In groups, learners research inheritance, and develop an activity using coloured beads to explain the concept to the rest of the class. Ensure that individuals explain using annotated diagrams.</p> <p>v) In groups, learners research the meanings of the following terms: chromosome, gene, dominant and recessive, heterozygous and homozygous, phenotype and</p>	<p>1) Observe groups and ensure that they are carrying out activities effectively, and making progress in terms of achieving learning outcomes.</p> <p>2) Listen to learners' group and whole-class conversations, prompt them and ask questions to ensure that they grasp difficult concepts.</p> <p>3) Evaluate the quality of contributions to group and whole-class discussions.</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>humans. (u, s)</p> <p>d) appreciate that variation in organisms is due to external and internal factors, and that mutations can be beneficial, harmful or neutral. (k, u)</p>	<p>genotype. Share their understanding with the whole class using visual aids they create. Ensure that individuals explain using annotated diagrams.</p> <p>vi) In groups, learners research, discuss and explain sex determination. Ensure that individuals explain using annotated diagrams.</p> <p>vii) Learners visit the school environment and its surroundings to observe different organisms, do research in groups to explain the meaning and give examples of variation due to environmental factors and genetics.</p> <p>viii) In groups, learners research and explain the significance of:</p> <ul style="list-style-type: none"> • beneficial mutations; • neutral mutations; and • harmful mutations. <p>ix) Groups present the findings to the rest of the class</p>	<p>Use products like annotated diagrams and genetic diagrams to gauge understanding.</p> <p>4) Observe groups interacting and listen to learners' conversations. Intervene as necessary to ensure that activities are leading to learning outcomes being achieved.</p> <p>5) Evaluate the quality of products: verbal explanations and presentations.</p>

Hint to the Teacher: Give examples of incomplete dominance and co-dominance. No details required.

THEME: Interrelationships

Topic 14: Introduction to Ecology

Duration: 1 Hour

Competency: The learner understands the concepts of communities, habitats and ecosystems.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) know the meaning of the term 'ecology'. (k)</p> <p>b) understand the concepts of communities, habitats and ecosystems. (s, u)</p>	<p>i) In groups, learners look at a map showing the main physical features of East Africa and identify at least five ecosystems, stating their distinguishing features.</p> <p>ii) Groups report and compile a class list of ecosystems and their characteristics.</p> <p>iii) In groups, learners study a local ecosystem and classify its living and non-living components, identifying the dominant organisms (that determine the other organisms found there) and the communities and habitats within the ecosystem.</p> <p>iv) Groups share ideas and discuss the ecosystem's components, its communities, habitats and dominant species.</p>	<p>1) Observe groups interacting and intervene as necessary to ensure that activities lead to learning outcomes being achieved.</p> <p>2) Listen to learners' conversations to monitor progress and understanding. Intervene to offer guidance as appropriate.</p> <p>3) Evaluate the quality of products: ecosystem descriptions and lists; conclusions regarding local ecosystem components, communities, habitats and dominant species.</p>

Topic 15: Food Chains and Food Webs

Duration: 2 Hours

Competency: The learner appreciates the interdependence of organisms in a given ecosystem.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to understand the feeding relationships in an ecosystem, and express them using food chains, webs, and pyramids. (k, u, s)</p>	<p>i) In groups, learners study a local ecosystem through field visits and observe, identify and record the organisms. The learners:</p> <ul style="list-style-type: none"> • note what food sources the animal species rely upon; • draw simple food chains and develop these into a food web; and • identify the trophic levels of the organisms observed. <p>ii) Groups share their reports with the class to ensure that all have a good level of understanding.</p> <p>iii) In groups, learners use the data from their local ecosystem, or use data provided showing numbers of organisms found in, for example, a grassland ecosystem, to:</p> <ul style="list-style-type: none"> • categorise the organisms as producers, primary consumers and secondary consumers; • calculate the number of organisms in each trophic level; 	<p>1) Observe groups carrying out activities and offer guidance to ensure that observation techniques are effective, and that identifications and interpretations of feeding relationships are accurate.</p> <p>2) Listen to learners' conversations and monitor progress and understanding.</p> <p>3) Ask questions to deepen the</p>

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
	<ul style="list-style-type: none"> • use the numbers to construct a pyramid of numbers; and • explain the appearance of the pyramid. <p>iv) Individuals record conclusions and draw pyramids.</p>	<p>understanding of the learners.</p> <p>4) Evaluate the quality of products: verbal and written reports, and pyramid drawings.</p>
<p>ICT Support. The learner can use:</p> <ul style="list-style-type: none"> • spreadsheets to enter and analyse data. • slide presentations for report on findings. <p>Hint to the Teacher: Details of pyramid of biomass and energy not required.</p>		



Topic 16: Associations in Biological Communities

Duration: 4 Hours

Competency: The learner appreciates that organisms naturally interact in different ways with one another in a given habitat.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) state what competition is and describe how organisms compete in nature. (k, u)</p> <p>b) differentiate prey from predators and describe a predator-prey relationship. (u, s)</p> <p>c) understand symbiosis, mutualism, commensalism and parasitism, and appreciate their roles in an ecosystem. (k, u)</p>	<p>i) Learners observe areas with dense natural populations of animals such as a farm or garbage pit, or they observe video clips, noting which organisms seem to be competing for the same type of food and/ or the same space, and report how the organisms behaved and which seemed to dominate.</p> <p>ii) In pairs, learners brainstorm examples of predator-prey relationships and present their conclusions in a chart showing what eats what (regular relationships only, not including, for example, man-eating lions. Encourage thinking about smaller organisms, invertebrates).</p> <p>iii) In groups, learners research the meanings of the terms: symbiosis, mutualism, commensalism and parasitism, and produce a poster/graphic image explaining each term and giving natural examples.</p>	<p>1) Observe pair and group interactions, ensuring that all are engaging and developing their understanding. Intervene to ensure progress towards learning outcomes.</p> <p>2) Listen to learners' discussions and probe to promote critical thinking and creativity in reports, posters, and to deepen learning.</p> <p>3) Evaluate quality of notes, charts, growth curves and analysis, posters/graphic images, reports and role-play.</p>

Topic 17: Humans and the Natural Environment

Duration: 2 Hours

Competency: The learner appreciates that Uganda has different natural resources and that our activities have an impact on these resources.

Learning Outcomes	Suggested Learning Activities	Sample Assessment Strategy
<p>The learner should be able to:</p> <p>a) give examples of natural resources found in Uganda. (k, u)</p> <p>b) understand the sources, effects and control of air, land and water pollution. (u, s, v)</p>	<p>i) In groups, learners brainstorm and carry out research so that they can:</p> <ul style="list-style-type: none"> develop a list of natural resources in Uganda; and classify the resources into renewable and non-renewable. <p>ii) In groups, learners research and report on:</p> <ul style="list-style-type: none"> the main sources of air, land and water pollution affecting the environment world-wide, and in Uganda, and their impact; and the strategies being used to address these forms of pollution, and their hopes and fears for the future. <p>iii) In pairs or groups, learners research and describe ways in which the different categories of garbage can be re-used or recycled.</p> <p>iv) Report on how effectively re-use and recycling are taking place in Uganda, and in the locality; what could/should be done to improve them. Include a strategy for more sustainable practices in school.</p>	<p>1) Observe pairs and groups carrying out activities. Help to guide research in order to optimise progress towards learning outcomes.</p> <p>2) Listen to learners' discussions and ask questions to probe and overcome any barriers or misunderstandings, and so deepen learning for all participants.</p> <p>3) Evaluate the quality of products: verbal feedback to the class, written reports, explanatory drawings/diagrams, and sustainability strategies.</p>

ICT Support

The learner can use word-processing, mind-mapping or any other software for data entry and report-making.

Assessment in the Accelerate Education Programme

Assessing the new expectations for learning

This curriculum sets new expectations for learning, with a shift from objectives that focus mainly on knowledge to learning outcomes that focus on skills and deeper understanding. These new Learning Outcomes require a different approach to assessment.

The “Learning Outcomes” in the syllabuses are set out in terms of Knowledge, Understanding, Skills, Generic Skills, Values, and Attitudes. This is what is referred to by the letters k, u, s, gs, v/a.

It is not possible to assess 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.

So this section focuses on knowledge, understanding skills, generic skills values and attitudes. Each has its own implications for learning and assessment.

Knowledge	The retention of information.
Understanding	Putting knowledge into a framework of meaning – the development of a ‘concept’.
Skills	The ability to perform a physical or mental act or operation.
Generic Skills	The skills that enable the learner to access and deepen learning across the whole curriculum
Values	The inherent or acquired behaviours or actions that form a character of an individual.
Attitudes	A set of emotions, beliefs or behaviours toward a particular object, person, thing or event.

To assess knowledge, skills and understanding we need to look for different things. Knowledge can be assessed based on written tests such as multiple-choice questions, fill-in-the-blanks, or other forms of recall-based assessments; understanding may be assessed based on short-answer questions, essays, or other forms of application-based assessments; but the assessment of skills may use the following strategies: performance-based assessments in which learners demonstrate their skills by performing a task or activity, observation of learners as they perform a task or activity to assess skills, such as communication skills, respect of each other's opinions, time management and teamwork, and peer assessments where learners evaluate each other's skills and providing feedback especially for promoting collaboration and communication skills. The assessment KUSVA is elaborated in the following graphic.

<p>Knowledge</p> <p>Knowledge is the easiest to assess because it is fairly straightforward to find out whether or not a learner has retained some information: a simple question can usually find this out. We ask them to name something, or state something, or label a diagram.</p>	<p>Skills</p> <p>Skills are the ability to perform a mental or physical operation, so we have to observe the skill being performed or look at the product, or outcome, of the skill; for example, a piece of writing, a picture or diagram.</p> <p>Some skills, such as speaking or a physical education skill do not have a product so need to be observed.</p>
<p>Understanding</p> <p>Assessing deeper understanding is much more difficult, so we usually ask learners to explain, compare or outline a process. This can be done orally (in conversation) or in writing, and will give us some idea of the extent of their understanding.</p>	<p>Values and Attitudes</p> <p>Values and Attitudes determine how we interact with others, working in a team, meeting deadlines, being self-driven, holding democratic values, and having respect for democracy, race, gender, disability, human dignity, culture, nation, life and social justice. Some skills, such as speaking or a physical education skill do not have a product so need to be observed.</p>

Formative Assessment

Assessments are used for a wide range of purposes in schools and education systems. Just as academic lessons have different functions, assessments are typically designed to measure specific elements of learning, e.g. the level of knowledge a learner already has about the concept or skill the teacher is planning to teach or the ability to comprehend and analyse different types of texts and readings. This syllabus focuses on the evaluation of progressive day-to-day classroom learning, hence formative assessment.

Formative assessment refers to a wide variety of methods that teachers use to conduct in-process evaluations of student comprehension, learning needs and academic progress during a lesson, unit or activity.

The general purpose of formative assessment is to improve learning and achievement, and to give educators in-process feedback about what students are learning or not learning so that instructional approaches, teaching materials and academic support can be modified accordingly. Formative assessments are usually not scored or graded, and they may take a variety of forms, from more formal quizzes and assignments to informal questioning techniques and in-class discussions with students.

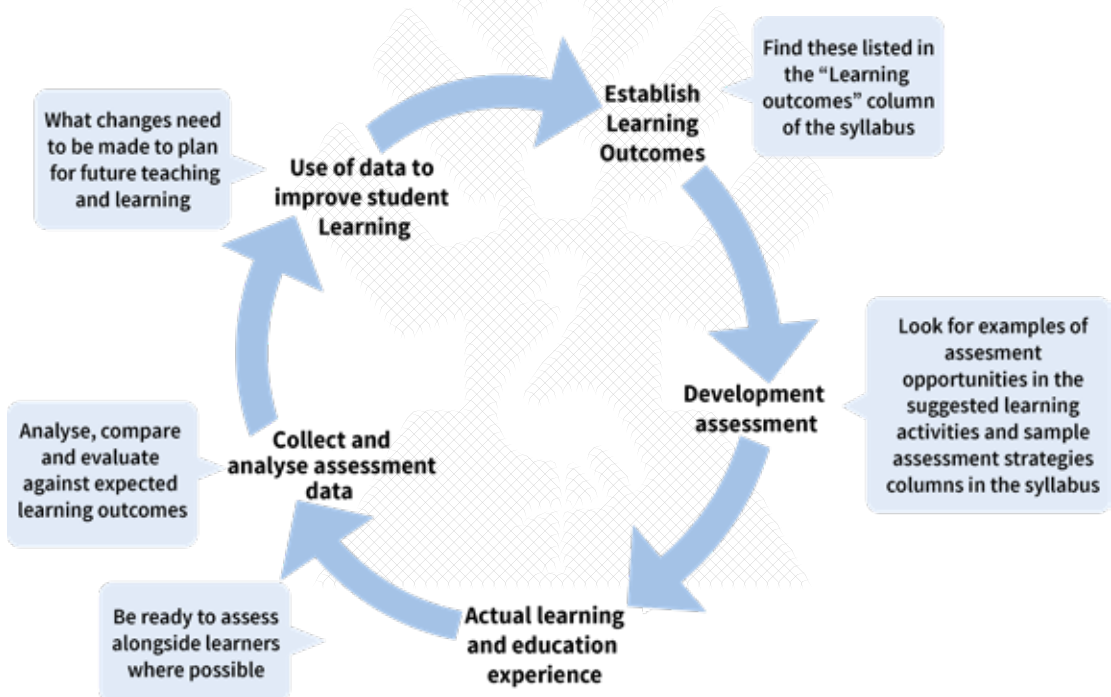
The general goal of formative assessment is to collect detailed information that can be used to improve instruction and learner's learning while it is happening. What makes an assessment "formative" is not the design of a test, technique or self-evaluation per se, but the way it is used, that is, to inform in-process teaching and learning modifications.

If assessment is to make a difference to teaching and learning, then teachers must use the information they gain from assessment to make some change to the teaching and learning process.

The changes that can be made include decisions about:

- i) What needs to be learnt next?
- ii) Whether an element of the syllabus needs to be taught again in a different way.
- iii) Changing teaching approaches if necessary.
- iv) Identifying learners who need more support, or who are making exceptional progress.
- v) Enabling learners to understand what they have to do to improve.

The process of teaching, formative assessment and improving the teaching/learning is shown in the following cycle.

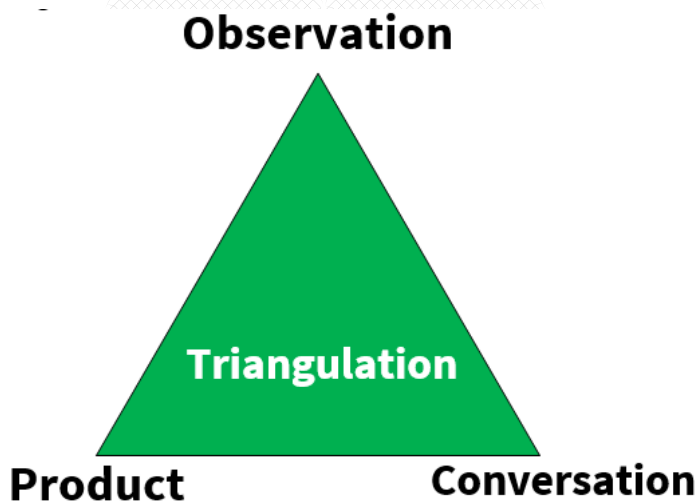


School-based formative assessment is a part of the normal teaching and learning process, and so the assessment opportunities will also occur during this normal process. It is not something that needs to be added on after learning; it is an integral part of it.

These opportunities occur in three forms and are often called:

- 1) **Observation** – watching learners working (good for assessing skills and values);
- 2) **Conversation** – asking questions and talking to learners (good for assessing knowledge and understanding); and
- 3) **Product** – appraising the learner’s work (writing, report, translation, calculation, presentation, map, diagram, model, drawing, graphs, painting etc.). In this context, a “product” is seen as something physical and permanent that the teacher can keep and look at, not something that the learner says.

When all the three are used, the information from any one 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”.



Triangulation of assessment

To find these opportunities, look at the syllabus topics. These set out the learning that is expected and give “Sample Assessment Activities”, and in doing so they contain a range of opportunities for the three forms of assessment.

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.

Attitudes

It is not possible to assess 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.

Summative Assessment

This will be done in two ways:

1) School-based summative assessment

This will be done by teachers assessing learners through activities of integration at the end of every topic or sub-topic and project work. This will cumulatively be collected at school and will be submitted to the national assessment body (Uganda National Examinations Board [UNEB]) to contribute 20% of the final score.

2) Examinations

There will be examinations at the end of Level One to test the suitability of the learners for promotion to Level Two. There will also be national examinations at the end of Level Two or at the end of S.4 if learners’ transit to the normal school.

Record keeping

Keeping detailed records of learners' individual progress is always difficult with very large numbers of pupils. For the purposes of school-based formative assessment, it is not even always necessary to keep such detailed records anyway. If feedback is given immediately and action is taken, then learning is changed and the record would soon become out of date and redundant.

Most formative class-based assessments are dynamic in that they feed straight back into the teaching and learning process. Therefore, detailed records of these are not appropriate.

What is needed is a record of assessments of learners' learning made in terms of each topic or unit. This means recording the ongoing summative assessments of each unit. There is no need to make separate records of each of the Learning Outcomes because this would be very time-consuming and also unnecessary. It is much more useful to make an overall assessment about whether or not each learner met the Learning Outcomes for each topic as a whole.

Each topic is made up of a number of Learning Outcomes. Therefore, teachers need to consider all the Learning Outcomes when making an overall judgement about the topic as a whole. It is not always necessary for every individual Learning Outcome to be achieved for the topic as a whole to be achieved. This will vary with the subject and topic.

By looking at the Learning Outcomes (LOs) within each topic, it is possible to identify three broad levels of learners in terms of their achievements:

Level of achievement	Descriptor
Basic	Some LOs achieved, but not sufficient for overall achievement
Moderate	Most LOs achieved, enough for overall achievement
Accomplished	All LOs achieved – achievement with ease

These overall assessments should be made on the basis of the many formative assessments that the teacher has made during the course of teaching the topic. If teachers have been working with the learners over the course of the topic, they will be able to make a broad judgement about which learners have achieved or have failed to achieve the topic's overall Learning Expectation.

These “Authentic Assessments” will be more valid and valuable than a test set by the school.

Recording these overall assessments will be simple, manageable and yet valuable, and can be recorded on a sheet such as the one below in which the categories are indicated with a number.

Although a very simple process, these four categories will give rich data when a comparison is made between the learners in each category for different subjects and units. They will also easily identify those learners who need extra support or who may not be ready to move on to the next grade at the end of a year.

If records are kept of the learning outcomes of each syllabus unit through the year, then there will be no need for an end-of-year test. Teachers will already have a record of those learners who have achieved the learning outcomes, and those who have not done so. Therefore, teachers will know if there were any learners not ready to progress to the next grade.

An overall record should be made of the individual unit assessments by subject in terms of the four descriptors. If numbers (1 – 3) are used as identifiers, then it will be possible to arrive at an overall number for a year by aggregating the identifiers for each unit.

Descriptor	Identifier
Some LOs achieved, but not sufficient for overall achievement	1
Most LOs achieved, enough for overall achievement	2
All LOs achieved – achievement with ease	3

In the example below, the table shows the end-of-unit assessment for six learners

Biology										
	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Learner A	3	3	2	3	3	3	3	2	3	3
Learner B	2	2	3	2	3	2	2	2	3	2
Learner C	1	1	2	1	1	2	2	3	2	3
Learner D	1	1	2	1	1	2	1	1	2	1

This method will give much more information than using a tick. For example, at a glance it can be seen that learners A and B are achieving much higher than learners C and D. It can be seen that Learner C has improved during the year. We can even see that more learners achieved success in Topic 9 than in Topic 7.

All of this is very valuable assessment information and can be used to improve learning.

This summative teacher assessment will contribute 20% to the final grade of the School Leaving Certificate as elaborated in the Assessment Framework.

Glossary of Key Terms

TERM	DEFINITION
Competency-based Curriculum	focuses on specific skills, knowledge and abilities that learners should acquire. It is learner-centred and adaptive to the changing needs of learners, teachers and society.
Differentiation	The design or adaptation of learning experiences to suit an individual learner's needs, strengths, preferences, and abilities.
Formative Assessment	refers to a wide variety of methods or strategies that teachers use to conduct in-process evaluations of learners' comprehension, learning needs, and academic progress during a lesson or topic to help teachers identify concepts that learners are struggling to understand, skills they are having difficulty acquiring, or learning standards they have not yet achieved so that adjustments can be made to the lessons and instructional techniques.
Generic skill	also known as transferable skills, are essential skills that can be applied across various subjects, occupations and contexts. They are not specific to a particular subject area but are essential in contributing to a learner's overall success in the learning of all subjects.
Inclusion	An approach to planning learning experiences which allows each learner to feel confident, respected and safe and equipped to learn at his or her full potential.
Learning Outcome	refers to a statement which specifies what the learner should know, understand, or be able to do within a particular aspect of a subject.
Process Skill	is 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	refers to an activity which gives a learner the opportunity to show the extent to which she/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	refers to an activity that is designed to support learners in achieving specific learning outcomes. It is typically provided by the teacher or educational resource as a way to guide learners in their learning and help them achieve their goals.



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