THE REPUBLIC OF UGANDA
Ministry of Education and Sports

ADVANCED SECONDARY CURRICULUM

AGRICULTURE SYLLABUS

NCDC
NATIONAL CURRICULUM DEVELOPMENT CENTRE

2025

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CONTENTS

Foreword

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

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

This Agriculture syllabus promotes learners application of agricultural knowledge in relation to what happens in their communities. It promotes acquisition of Higher-order Thinking Skills (HOTS) such as inquiry, creativity and innovation, decision-making, critical thinking and problem-solving. It calls for use of learner centred pedagogies with hands-on experience by the learners in real life situations, while acknowledging different learner abilities and learning styles.

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

Hon. Janet Kataaha Museveni

First Lady and Minister of Education & Sports

ACKNOWLEDGEMENTS

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

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

Dr Grace K. Baguma
Director
National Curriculum Development Centre

1.0 INTRODUCTION

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

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

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

1.1. Changes in the Curriculum

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

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

1.2. Classroom Based Assessment

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

1.3. Learners with Special Education Needs

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

1.4 Generic Skills

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

The key generic skills include:

1

Critical thinking and problem-solving

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

2

Co-operation and Self-Directed Learning

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

3

Creativity and Innovation

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

4

Communication

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

5

Mathematical Computation

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

6

Information and Communication Technology (ICT) Proficiency

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

7

Diversity and Multicultural Skills

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

1.5. Cross-cutting Issues

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

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

These are a concern to all mankind irrespective of their areas of speciality. They are infused into the different learning outcomes of the different subjects.

1.6. Values

The curriculum is based on a clear set of values. These values underpin the whole curriculum and the work of schools. Learners need to base themselves on these values as citizens of Uganda. These values are derived from the Uganda National Ethics and Values Policy of 2013. They are:

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

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

1.7. Information and Communication Technology Integration

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

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

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

1.8. Projects

Projects and project-based learning are part and parcel of learning in the 21st century. A number of tasks have been integrated in the syllabus for different topics. You are encouraged to develop more project-based learning tasks with your learners that can easily be linked to what is happening in your local environment. While doing this, make effort to keep aligned to the learning outcomes of the topic you are teaching.

1.9. The Aims of Secondary Education

The aims of Secondary education in Uganda are to:

i) instil and promote national unity, an understanding of 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;
ii) promote an appreciation and understanding of the cultural heritage of Uganda including its languages;
iii) impart and promote a sense of self discipline, ethical and spiritual values, personal and collective responsibility and initiative;
iv) enable individuals to acquire and develop knowledge and an understanding of emerging needs of society and the economy;
v) provide an up-to-date and a 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;
vi) enable individuals to develop basic scientific, technological, technical, agricultural and commercial skills required for self-employment;
vii) enable individuals to develop personal skills of problem-solving, information gathering and interpretation, independent reading and writing, self-improvement through learning and development of social, physical and leadership skills such as are obtained through games, sports, societies and clubs;
viii) lay the foundation for further education;
ix) enable the individual to apply acquired skills in solving the problems of his/her community, and to develop a strong sense of constructive and beneficial belonging to that community;
x) instil positive attitudes towards productive work and strong respect for the dignity of labour and those who engage in productive labour activities;
xi) develop a positive attitude towards learning as a lifelong process.

1.10. Aims of the Advanced Secondary Curriculum

i) To adopt a competency-based learning approach.
ii) To develop holistic education for personal and national development based on clear shared values.
iii) To develop key skills which are essential to work and life and promote life-long learning.
iv) To adopt an integrated approach to learning that develops the ability of learners to apply learning.
v) To improve on assessments by incorporating school-based assessment into end of cycle assessment.
vi) To emphasise learners participation through engagement with the community.
vii) To prepare learners for further education.

1.11. Rationale for Teaching Agriculture at Advanced Level

The Advanced level curriculum aims to:

i) equip learners with the necessary knowledge and skills in sustainable agriculture, including crop management, animal husbandry, and value addition to agricultural product,
ii) enable learners to acquire knowledge and skills to contribute to the transformation of the agricultural sector and improvement of agricultural productivity,

1.12. Subject Overview

The areas of study have been re-organised within the syllabus to come up with the adapted version. The subject areas of study are:

i) Animal production
ii) Crop production
iii) Value addition to crop, animal and their product for the consumer

The aligned syllabus has been developed with a new scope and sequence. Its main focus is a value chain approach. There are 2 value chains, viz:

i) Crop value chain
ii) Animal value chain

The value chain should focus on the following:

i) Establishment of a Crop or Animal enterprise
ii) Managing the enterprise
iii) Product value addition for the market

iii) prepare learners for careers in agriculture and other related sectors.

1.13. Time Allocation

The learners shall be engaged for nine (9) periods per week from Senior five to Senior six.

1.14. Programme Planner

Class/Term	Topic	Sub-topic		Periods
Senior Five Term 1	1. Agricultural Biology in Crops and Animals	1.1	Cells and Cell Physiology	20
		1.2	Biochemical compounds in Cells	20
		1.3	Transmission Genetics and Genetic Engineering	23
			Total	**63**
Class/Term	**Topic**	**Sub-topic**		**Periods**
Senior Five Term 2	1. Anatomy, Morphology and Physiology	2.1	Animal Anatomy, Morphology and Physiology	40
	2. Livestock Management and Rearing Practices	3.1	Establishing A Farm Animal Enterprise	
		3.2	Animal Husbandry and Management Practices	50
			Total	**90**
Class/Term	**Topic**	**Sub-topic**		**Periods**
Senior Five Term 3	3. Harvesting Farm Animals and Animal Products	4.1	Preparation for Harvesting	9
		4.2	Harvesting of Animals and Animal Production.	18
	4. Value Addition	5.1	Value Addition to Farm Animal Products	23
	5. Animal Product Marketing	6.1	Marketing Animal Products	15
		6.2	Financial Management	7
			Total	**72**
Class/Term	**Topic**	**Sub-topic**		**Periods**
Senior Six Term 1	1. Land Policy	1.1	Land Tenure System	9
		1.2	Land Reforms in Uganda	9
	2. Soil Systems	2.1	Soil Properties	20
		2.2	Fertilizers	12
	3. Crop Production and Husbandry	3.1	Establishing a Crop Enterprise	40
			Total	90

Class/Term	Topic	Sub-topic		Periods
Senior Six Term 2	3. Crop Production and Husbandry	3.2	Managing a Crop Enterprise	50
	4. Crop Harvesting and Handling	4.1 4.2	Pre-harvest Practices Harvesting of the Crop	11 20
			Total	**81**
Class/Term	**Topic**	**Sub-topic**		**Periods**
Senior Six Term 3	5. Crop and Crop Product Marketing	5.1	Cobweb Theorem Application in Crop and Crop Products Marketing	24
		5.2	Marketing Organisation of Crop and Crop Products	30
			Total	**54**

1.15. Note to Users

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

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

The learning activities and assessment strategies in the syllabus are "suggested" and "samples" respectively and not exhaustive. Teacher is encouraged to develop more learning activities and assessment strategies that are based on the learning outcomes. In addition, teacher is free to customise the suggested learning activities to make them suitable for their respective learning environments and for learners with Special Educational Needs (SEN).

2.0 DETAILED SYLLABUS

SENIOR FIVE TERM 1

CONSTRUCT: ANIMAL PRODUCTION

TOPIC 1: Agricultural Biology in Crops and Animals

Duration: 63 Periods

Competency: The learner demonstrates understanding of cellular Biology principles to illustrate their role in supporting agricultural production.

Learning Outcomes The learner should be able to:	Suggested Learning Activities	Sample Assessment Strategy
i) explore the role of plant cells and animal cells in agriculture production. (k, u, s, v/a, gs) ii) apply the knowledge of genetics and genes to address challenges in crop and animal production. (k, u, s, v/a, gs)	i) In groups, learners use microscopes to examine cells to see and draw shapes from different parts of crops and animals. ii) In pairs or individually, learners extract DNA from common fruits (like strawberries or bananas) to see the physical form of this biochemical compound. iii) In groups learners carry out scientific investigations on the effect of enzymes on different substrates, such as the breakdown of hydrogen peroxide by catalase (and others like Amylase, found in saliva or commercial amylase) breaks down starch. Protease (such as: papain found in papaya or bromelain found in pineapple) break down proteins like gelatin into smaller peptides or amino acids.	i) The teacher observes how learners manipulate the microscope and the drawing of different cell shapes. ii) The teacher converses with learners about how alcohol is used to precipitate the DNA checks their scientific methods of documenting the role and significance of reagents/extracted DNA. iii) The teacher converses with learners about what happens to Iodine, how Iodine will turn blue-black in the presence of starch and as the amylase breaks down the starch, the solution will no longer turn blue-black, indicating the enzymatic activity. iv) The teacher converses with learners about the scientific inquiry process skills including the key steps of scientific investigation such as aim, questioning hypothesis/prediction, aim, procedure for the experiment, observation, analysis, conclusion and recommendation.

	iv) In pairs, learners demonstrate diffusion, osmosis and active transport in cells. v) In groups, learners perform experiments to observe the effects of different factors on the rate of diffusion, osmosis and active transport in cells. vi) As a class, learners brainstorm the causes, similarities and differences among organisms with a focus on genetics. vii) In groups, learners predict the outcomes of genetic crosses according to Mendelian theory and create a poster illustrating their predictions. viii) In groups, learners participate in project-based learning on how we can improve yields and health of crops and animals using genetics in their community.	v) The teacher checks the scientific investigations being performed by learners to ensure chronology of the steps expected. vi) The teacher checks the poster presented by learners showing the genetic crosses according to Mendelian theory. vii) The teacher uses the observation checklist and scoring grid with a scale of 1—4 to record achievements on several areas including; group work behaviour, being on task, group work participation, communication to an audience, organisation of portfolio, use and application of concepts when learners are engaged in project-based learning activities.

ICT support to the suggested learning activities to leverage resource efficiency as the learners can actively participate and engage in activities without limitation (as many times as possible)

1) Use reputable online resources like Open Educational Resources for Agriculture, Open Genetics, Khan Academy and Educational YouTube channels to gather background information on cells, biochemical compound, genetics, various agricultural biology experiments and project-based learning task.
2) Use interactive simulations to create virtual experiments to manipulate variables to see how changes affect diffusion, osmosis, and active transport.
3) Participate in a simulation game to understand the process of cellular respiration and the role of biochemical compounds like glucose and ATP.
4) Use PowerPoint, Prezi, or other presentation software to present their findings from scientific investigation, inquiry or methods.
5) Use Excel or Google Sheets for students to input their data on how to predict the outcomes of genetic crosses according to Mendelian theory.

SENIOR FIVE TERM 2
CONSTRUCT: ANIMAL PRODUCTION

TOPIC 2: Anatomy, Morphology and Physiology

Duration: 40 Periods

Competency: The learner demonstrates the relationship between anatomy and physiology of animals for increased production.

Learning Outcomes The learner should be able to:	Suggested Learning Activities	Sample Assessment Strategy
i) examine the shape, form and appearance of an animal to determine the quality of the animal. (k, u, s, v/a, gs) ii) analyse the relationship between different animal body systems for increased production. (k, u, s, v/a, gs) iii) apply the knowledge of morphology to select an animal to rear. (k, u, s, v/a, gs)	i) In groups, learners choose an animal to examine and record the shape, form and appearance which has been discussed and agreed upon by the parties concerned to align with the learners' goals, resources, and capabilities. ii) As a class, learners make a field visit to a farmer rearing animals to examine the morphological features and make recommendations about individual animals then write a field visit report. iii) In groups, learners dissect a selected animal to examine its digestive and reproductive systems to explain how different systems interact to ensure growth, health and productivity.	i) The teacher observes and checks the criteria the learners use to choose an animal for rearing which aligns with the learners' goals, resources, and capabilities. ii) The teacher checks the accuracy and coherence of the report (subject knowledge, organisation, structure, technical correctness, being attractive to the reader and communication effectiveness) about the field visit which includes the recommendations they made. iii) The teacher observes and checks how learners analyse the relationship between the body systems using a dissection safety protocol including pre dissection preparation, actual dissection of the structural parts, display of the parts, clean up and reporting of information gathered from the analysis. iv) The teacher checks the organisation, accuracy and coherence (subject knowledge, organisation, structure, technical correctness, being attractive to the reader and communication effectiveness)

		of the learners' charts/leaflets on the digestive and reproductive system. v) The teacher checks for accuracy of subject details, sequencing and coherence of the report and an article for a newspaper guiding farmers on how to select an animal for rearing.

ICT support to the suggested learning activities to leverage resource efficiency as the learners can actively participate and engage in activities without limitation (as many times as possible)

1) Use digital forms or apps (e.g., Google Forms) for learners to input data on morphological features, health status, and other observations of the animals in real-time.
2) Use tablets or smartphones after getting permission and consent to take photos, videos, record interviews with the farmer and notes during the field visit.
3) Use any word processor to write the field visit report.
4) Use tools like Google Docs or Microsoft OneNote for learners to collaboratively write their field visit report.
5) Use virtual dissection software to complement the hands-on dissection and to allow you explore and understand the anatomy of the animal in a controlled repeatable environment.
6) Write and send emails to your instructor or any relevant stakeholder to demonstrate how to professionally communicate dissection findings.

TOPIC 3: Livestock Management and Rearing Practices **Duration:** 50 Periods

Competency: The learner applies evidence-based livestock management and rearing practices to ensure optimal quality production.

Learning Outcomes The learner should be able to:	**Suggested Learning Activities**	**Sample Assessment Strategy**
i) establish a farm animal enterprise for a selected animal to rear. (k, u, s, v/a, gs) ii) perform relevant animal husbandry practices for a selected animal for optimal production. (k, u, s, v/a, gs) iii) apply basic occupational health, safety and environmental protection practices in production of a selected animal. (k, u, s, v/a, gs)	i) In groups, learners prepare a business model canvas for rearing a selected animal. ii) As a class, learners construct or renovate structures for a selected animal. iii) In groups, learners analyse feed samples to determine nutrient composition and formulate a feed for the selected animal. iv) As a class, learners perform the required management and rearing practices for a selected animal. v) In groups, learners handle and manage health in a selected animal while observing basic occupational health, safety and environmental protection practices.	i) The teacher checks for the accuracy and coherence (subject knowledge, organisation, structure, technical correctness, being attractive to the reader and communication effectiveness) of the learners' chart/leaflet that has been made to address the components of a business model canvas for rearing a selected animal. ii) The teacher observes and checks learners using a psychomotor skills checklist (Imitation, manipulation, precision, articulation and naturalisation) as they are constructing or renovating structures for a selected animal. iii) The teacher observes and converses with learners while checking the 25 steps of scientific investigation protocol when analysing feed samples. iv) The teacher observes learners with an affective skills checklist (starting with receiving/ attending to, responding, valuing, organising and characterising) as they are performing the required management and rearing practices for a selected animal. v) The teacher observes learners and checks with both affective and psychomotor skills checklist (Imitation, manipulation, precision, articulation and naturalisation) as they handle ill health in a selected animal while observing basic occupational environmental protection practices.

ICT support to the suggested learning activities to leverage resource efficiency as the learners can actively participate and engage in activities without limitation (as many times as possible)

1) Use tools like Microsoft PowerPoint, Google Slides, or Prezi to create engaging presentations that showcase the business model canvas and key insights.
2) Use word processors like Microsoft Word or Google Docs to write details that explain your business model canvas and justify your decisions.
3) Use digital scales to measure feed samples accurately and sensors for collecting data on moisture content, temperature, and other relevant parameters when analysing feed samples.
4) Utilize spreadsheet software like Microsoft Excel or Google Sheets to input raw data and perform calculations for nutrient composition when analysing feed samples.
5) Use apps or software designed for analysing the nutrient composition of animal feeds to obtain detailed accurate information on protein, fat, carbohydrate content, mineral salts and more when analysing feed samples.
6) Use word processors like Microsoft Word or Google Docs to write a detailed report on analysis of feed samples and ensuring proper formatting, grammar checks, and the inclusion of multimedia elements.
7) Use the internet and digital libraries to research different animals, or specifically, the selected animal and their habitats.
8) Use digital whiteboards to display instructions, diagrams, and videos of constructing of a selected animal.
9) Create detailed plans and models using CAD (Computer-Aided Design) software.
10) Utilize platforms like YouTube or educational websites that show videos on proper animal care techniques for the selected animal.
11) Use apps, Google sheets or software to maintain records of feeding schedules, health checks, and growth progress when performing the required management and rearing practices.
12) Use online platforms to remotely consult with veterinarians or animal health experts to access professional guidance on handling and treating ill animals.
13) Use available mobile apps to access information on animal care, symptoms of common illnesses, and first aid procedures for the selected animal.
14) Utilize health monitoring devices that can track an animal's vital signs, animal occupational safety and health parameters for the selected animal.

Note to stakeholders including teachers, school managers and assessors

a) Educators, teachers and school managers should establish a strong relationship and build trust with the local community as a foundation of community engagement in animal and crop production. This will enable them use community resources for teaching.
b) Choice of livestock to rear as you teach animal production. Select the livestock to rear from any one of the following categories according to resources you have:
   i) **Ruminants:** Cattle, sheep, goats, deer, giraffes, camels, and buffalos
   ii) **Non-Ruminants:** Fowls, horses, dogs, rabbits, crocodiles, elephants, donkeys, pigs, cats
   iii) **PISCES:** Tilapia, Nile perch, silverfish, cat fish, lung fish, tiger fish

SENIOR FIVE TERM 3
CONSTRUCT: ANIMAL PRODUCTION

TOPIC 4: Harvesting Farm Animals and Animal Products

Duration: 27 Periods

Competency: The learner harvests optimal quality farm animals and animal products for the market.

Learning Outcomes The learner should be able to:	Suggested learning activities	Sample assessment strategy
i) demonstrate understanding of various harvesting techniques for the selected animal and animal product for the market. (k, u, s, v/a,g s) ii) harvest farm animals and animal products in compliance with local and international regulations to ensure product safety and animal welfare. (k, u, s, v/a,g s)	i) As a class, learners make a field visit to a farm to observe the harvesting of farm animals and animal products or interact with a video simulating the harvesting of animals and animal products and make a report. ii) In groups, learners investigate and present findings using a leaflet on local and international regulations regarding farm animal harvesting and animal product safety. iii) In pairs or groups, learners analyse a case study on animal welfare and product safety in farm animal harvesting and recommend improvements, key takeaways and insights on a poster. iv) In groups, learners harvest the animal and products for the market while exhibiting the affective and psychomotor skills including harvesting process and procedures, animal handling techniques, attention to details, coordinating the	i) The teacher checks for accuracy and coherence (subject knowledge, organisation, structure, technical correctness, being attractive to the reader and communication effectiveness) of the learners' report on the experiences during the field visit or interaction with a video of harvesting of animals and animal products. ii) The teacher checks learners for accuracy and coherence (subject knowledge, organisation, structure, technical correctness, being attractive to the reader and communication effectiveness) of the learners' leaflet on the local and international regulations regarding farm animal harvesting and animal product safety to produce. iii) The teacher converses and checks with learners (using sentences like: *Can you describe a situation where you…? How do you think* [specific concept or principle] *relates to real-life? What do you think are the most important factors to consider when….? What did you learn about …? How would you overcome*

	animal movement, respect for the animal, taking ownership of harvesting decisions and showing compassion for the animal being taken to the market.	*challenges or obstacles highlighted during this learning experience? Can you provide an example…? Can you describe a situation where you had* to adapt [specific concept/idea/skill] *to a new or unfamiliar context? What do you think are the most important factors to consider when….?*) about the case study and poster to check for accuracy and coherence of what they recommend as improvements to ensure animal welfare and product safety. iv) The teacher observes and checks learners' achievement using affective and psychomotor skills checklist and scoring rubric with a scale 1 to 4 as learners harvest the farm animals and animal products for the market.

ICT support to the suggested learning activities to leverage resource efficiency as the learners can actively participate and engage in activities without limitation (as many times as possible)

1) Use online databases and resources where you find up-to-date information on international and local regulations and safety standards for farm animal harvesting and animal product safety.
2) Use presentation software like PowerPoint, Prezi, or Canva to create visually appealing and informative leaflets on local and international regulations regarding farm animal harvesting and animal product safety.
3) Share your leaflets and findings on local and international regulations regarding farm animal harvesting and animal product safety using available social media platforms,
4) Utilize platforms like YouTube or educational websites that show step-by-step videos on the proper procedures for harvesting animals and products.
5) Use apps or software to maintain digital records of the harvesting process, including animal health data, harvesting schedules, and product quality and pay attention to details and track progress.
6) Create digital journals, blogs, or presentations documenting animal harvesting experiences, the decisions made during the process, and the emotions felt each time of harvest and word process all these into reflective paragraphs.

CONSTRUCT: VALUE ADDITION FOR THE MARKET

TOPIC 5: Value Addition to Farm Animal and Animal Products

Duration: 23 Periods

Competency: The learner adds value to the farm animal and to animal products for the market.

Learning Outcomes The learner should be able to:	Suggested Learning Activities	Sample Assessment Strategy
i) demonstrate knowledge and practical skills in adding value to farm animal and animal products for market readiness. (k, u, s, v/a, g s) ii) design effective packaging, branding, labelling, and advertising material to be used on farm animal and animal products ensuring compliance with local and international regulations. (k, u, s, v/a, g s)	i) As a class, learners visit a farm to observe and make a report on the post-harvest handling of farm animals and animal products for market readiness. ii) In groups learners engage in a role-playing game or presentation where they act as entrepreneurs who are able to create a simple budget, savings plan and investment plan based on their personal financial goals; to manage their business for marketing an animal or animal product. iii) In groups learners or individually transform an animal product from their selected enterprise to demonstrate value addition for the market.	i) The teacher checks for accuracy and coherence (subject knowledge, organisation, structure, technical correctness, being attractive to the reader and communication effectiveness) of the learners' report on the experiences of post-harvest handling of farm animals and animal products that meets market readiness standards. ii) The teacher observes, converses and checks learners as they engage in the role-playing game using a checklist and scoring rubric of participation in the task; engagement with the task; make informed decisions using available information; working together effectively; sharing ideas; building on each other's strengths; generation of a budget, saving plan, and investment plan; ability to clearly and effectively communicate to a given audience. iii) The teacher converses and checks learners as they engage in the role-playing game using open -end questions like: a) What are your short-term and long-term financial goals? b) How did you determine your budget and savings plan? c) What investment strategies are you using, and why?

		d) How might your financial plans be impacted by real-world factors, such as economic changes or unexpected happenings? iv) The teacher checks for accuracy and coherence of the financial plans completeness and feasibility to ensure they include all required components for the personal goals stated when making the budget, savings plan, and investment plan report (subject knowledge, organisation, structure, technical correctness, being attractive to the reader and communication effectiveness) including v) The teacher observes and checks learners as they engage in the role-playing game using a checklist and scoring rubric for their ability to clearly and effectively present their financial plans, using visual aids or using presentation tools like PowerPoint, Prezi, or Canva and clear language. vi) The teacher converses and checks the learners' design processes and products in making packaging, branding, labelling, and advertising material using a scoring rubric including knowledge of the product, planning of activities, consideration of target audience, depth of investigation about animal product designs process, collaboration, communication about the market product, compliance to standards, preservation and protection of the products to serve the user, advertising strategies, persuasives of the messages and promoting of the brand. vii) Observe learners as they perform each step transforming the animal product and use checklist to assess

	iv) In groups, learners design a packaging, branding, labelling and advertising system for their assigned farm animal and animal product adhering to the local and international regulations.	their adherence to each step by checking correct handling and preparation of materials, observing occupational health, safety and environmental protection practical's following food safety guidelines and good manufacturing practices viii) Observe learners to check team work and collaboration during the activity, hoe they come to agreement during each step and their individual participation in the task. ix) Examine the product presentation and display for the market.

ICT support to the suggested learning activities to leverage resource efficiency as the learners can actively participate and engage in activities without limitation (as many times as possible)

1) Use tablets or smartphones after getting permission and consent to take notes, photos, and videos during the farm visit so that the learner can capture observations in real-time about farm animal and animal products and have visual references for including in the word-processed reports.
2) Use video conferencing tools like Zoom or Skype to facilitate live interviews, interaction, or Question and Answer sessions on value addition to farm animal and animal products.
3) Use digital cameras after getting permission and consent to take high-quality images of the post-harvest processes to be included in the reports as visual evidence of findings for the farm visit where farm animal and animal products are obtained from.
4) Use online resources and databases where to find additional information about best practices in post-harvest handling and market readiness of farm animal and animal products.
5) Use software like PowerPoint, Canva, or Prezi to create engaging and visually appealing reports on experiences and findings about value addition to farm animal and animal products.
6) Use digital maps to mark different locations and stages of the post-harvest process of farm animal and animal products.
7) Use online resources to research on local and international regulations regarding packaging, labelling, and advertising to ensure that the designs created are compliant with industry standards for value addition to farm animal and animal products.
8) Use graphic design tools like Adobe Illustrator, Photoshop, or Canva to create professional-looking packaging designs, logos, and labels for farm animal and animal products.
9) Use survey platforms like Google Forms, Kobo Collect or SurveyMonkey to gather feedback on the designs and advertising concepts of farm animal and animal products.
10) Create social media marketing strategies using platforms like Instagram, Facebook, WhatsApp or TikTok to establish and appreciate the importance of digital marketing and audience engagement for farm animal and animal products.

CONSTRUCT: VALUE ADDITION FOR THE MARKET

TOPIC 6: Animal Product Marketing

Duration: 22 Periods

Competency: The learner markets the farm animal and animal products for profit.

Learning Outcomes The learner should be able to:	Suggested Learning Activities	Sample Assessment Strategy
i) analyse market trends and opportunities to determine the most profitable market channels for farm animal and animal products. (k, u, s, v/a, g s) ii) execute a marketing strategy that effectively promotes farm animals and animal products to target markets. (k, u, s, v/a, g s)	i) In groups, learners conduct a market survey and investigation to identify trends and opportunities for farm animals and animal products using survey tools and templates that will support their presentation of findings in a report. ii) In groups, learners participate in a project-based learning task using the driving question of; *how can we execute a marketing campaign that promotes farm animals and animal products to target markets in our community.*	i) The teacher checks for accuracy and coherence of the market survey report (subject knowledge, organisation, structure, technical correctness, being attractive to the reader and communication effectiveness) including how data was collected, the sampling methods, the use of appropriate charts, graphs, and tables to visually represent findings, a detailed analysis of the data gathered, recommendation and the lesson learnt about the market channel of farm animals and animal products. ii) The teacher converses and checks learners using prompts like; *what market trends and opportunities did you identify? How did you respond to changes in the market? What were the most profitable market channels for your product? What did you learn about the importance of market analysis and adaptation in the agriculture industry?* iii) The teacher uses the observation checklist and scoring grid with a scale of 1–4 to record achievement on several areas including group work behaviour, being on task, group work participation, communication to an audience, organisation of portfolio, use and application of concepts when learners are engaged in project-based learning.

ICT support to the suggested learning activities to leverage resource efficiency as the learners can actively participate and engage in activities without limitation (as many times as possible)

1) Use tools like Google Forms, SurveyMonkey, or Typeform to create and distribute surveys so that there is easy and fast data collection and analysis of data on animal product marketing.
2) Use computer software like Excel, Google Sheets, or Tableau to analyze survey data and identify trends and opportunities after visualizing the data through charts and graphs for data on animal product marketing.
3) Use digital whiteboards like SMART Boards to display survey instructions, diagrams, and videos to help in visualizing the steps involved in the market survey process during animal product marketing.
4) Use the internet and digital libraries to conduct research on market trends and opportunities to enhance marketing of farm animals and animal products.
5) Use graphic design software such as Adobe Illustrator, Canva, or Photoshop to create logos, branding materials, and packaging designs for the marketing campaign.
6) Execute a social media campaign using platforms like Instagram, WhatsApp, TikTok, Facebook, and Twitter.
7) Create an online presence for their marketing campaign by developing a website for the marketing campaign using website builders like Wix, WordPress, or Squarespace to put the animal product features or information, blogs, and an online store.
8) Use presentation software like PowerPoint, Prezi, or Canva to create presentations summarizing the animal product marketing research carried out, strategies employed, and the marketing campaign results.

SENIOR SIX TERM 1
CONSTRUCT: CROP PRODUCTION

TOPIC 1: Land Policy

Duration: 18 Periods

Competency: The learner demonstrates an understanding of land rights, land tenure and land reform to ensure sustainable crop production.

Learning Outcomes The learner should be able to:	Suggested Learning Activities	Sample Assessment Strategy
i) apply knowledge of land tenure systems to promote sustainable agricultural production within the community. (k, u, s, v, a g s) ii) demonstrate the impact of land reforms for sustainable crop production within the community. (k, u, s, v, a g s)	i) In groups, learners participate in a role play on a scenario that reflects a real-life land tenure issue, such as a dispute over land ownership, boundary marks or a community's struggle to access land for farming and bring out things like collaboration, participation, respect, critical thinking and communication. ii) Individually, learners search for information on different land reforms in Uganda then write a letter to local authorities advocating for land reforms to enhance sustainable crop production.	i) The teacher observes and checks the learners' record of achievement in the role plays on land tenure issues in regards to the following: a) Working well in a team or as a group b) Accuracy and acceptability of one's role c) Speaking with conviction d) Use of non-verbal cues such as gestures, eye contact or expression and body language e) Clarity of speech f) Delivery of the illustrated key message ii) The teacher converses and checks using the following prompt as a debrief for the role play such as: a) What were some of the challenges they faced during the role-play?

Learning Outcomes The learner should be able to:	Suggested Learning Activities	Sample Assessment Strategy
		b) How did they negotiate and make decisions? c) What did they learn about the importance of land tenure in their community? d) How can they apply what they learnt? iii) The teacher checks the key components of the letter to the local authorities advocating for land reforms that enhance sustainable crop production with emphasis on date and address; introduction with salutation, to the appropriate authority, a brief overview of the current land use; the outline of the land use issues and challenges, proposed reforms, highlight of the reform benefits, the statement of the request being made and finally, the signature, name and designation of the writer.

ICT support to the suggested learning activities to leverage resource efficiency as the learners can actively participate and engage in activities without limitation (as many times as possible)

1) Use Wakelet, Google Space, Google Docs, Microsoft OneDrive, or Dropbox Paper for creating and sharing documents related to the role-play scenario so that you can collaboratively write scripts, gather resources, and develop their arguments using scenario about land ownership, boundary marks or a community struggle to access land for farming.
2) Use the internet and digital libraries to research real-life land tenure issues, the national land tenure legal frameworks, and land policy case studies to gather information to enrich their role - play

Learning Outcomes The learner should be able to:	Suggested Learning Activities	Sample Assessment Strategy
3) Use simulation tools or role-playing games that replicate real-life land tenure disputes in a community to get immersed in the scenario and make decisions based on the situation presented or pick lesson to support what to do in the role-play. 4) Use Geographic Information Systems (GIS) or Google Earth to visualize land boundaries, ownership disputes, and community land usage so as to support their arguments in the role-play. 5) Record the land issue role-play session using digital tools like Zoom or mobile devices to playback and use it for reflection, self-assessment, and peer feedback. 6) Use online databases, academic journals, and government websites to research land reforms in Uganda. Websites like www.uganda land alliance.com to gain access to a wide range of resources and develop research skills. 7) Use digital libraries and archives to access historical documents, reports, and case studies related to land reforms in Uganda. 8) Organize webinars, Zoom, Microsoft Teams or invite virtual guest speakers who are experts in land reforms in Uganda using a platform like Zoom or Microsoft Teams can facilitate these sessions to get real-world or real-life insights and expert knowledge.		

CONSTRUCT: CROP PRODUCTION

TOPIC 2: Soil Systems

Duration: 32 Periods

Competency: The learner demonstrates understanding of soil systems for crop productivity.

Learning Outcomes The learner should be able to:	Suggested Learning Activities	Sample Assessment Strategy
i) demonstrate understanding of soil analysis and soil properties for crop production in their community. (k, u, s, v, a gs) ii) evaluate the suitability of different soil types for growing the selected crops for a soil profile. (k, u, s, v, a gs) iii) apply strategies for sustainable soil management within their community and school for crop production. (k, u, s, v, a gs) iv) demonstrate the ability to prepare liquid and solid organic fertilisers using locally available materials for use in the selected crops to be grown. (k, u, s, v, a gs)	i) In groups, learners collect soil from their community and prepare soil samples using the soil analysis protocol (pre analysis preparation-soil sampling, sample handling, sample preparation; physical analysis-texture, particle size distribution, water holding capacity, bulk density, chemical analysis-pH, nutrient, biological analysis-number of microorganism and amount of organic matter). ii) In groups, create an edible soil profile cup using locally available material, draw a poster and colour their cup profile to show the ingredient used in each horizon with a description why they used it. iii) In groups, learners perform scientific investigations of different soil types to analyse them and make a report about different soil properties. iv) In pairs, learners design soil management strategies to meet the requirements of soil ecosystem services and	i) The teacher observes and checks learners as they follow the soil analysis protocol to collect soil and prepare samples. ii) The teacher converses using the following prompts: a) Can anyone share why it's important to know about soil properties? b) What are some properties of soil that we should be looking at during our analysis? c) How do you think these properties affect plant growth? d) What do you notice about the size distribution of particles? e) Can you describe the colour of the soil sample? f) What might this colour indicate about the soil composition? g) What methods are you using to test the soil's moisture content and soil Ph? h) Why is moisture and pH important for soil health? i) What was the most surprising thing you learned during the soil analysis?

	landscape functions of their community. v) As a class, learners prepare both liquid and solid organic fertilisers using locally available materials that can be used in the selected crop to be grown.	j) How do you think understanding soil properties can help us make better agricultural decisions? iii) The teacher then checks with the learners to ascertain their understanding of the soil properties by undertaking the soil analysis protocol. iv) The teacher checks for the key components of a poster of the edible soil profile horizon representation with a description illustrating that it is visually appealing, informative, and engaging. v) The teacher checks for the 25 steps of scientific investigation protocol when analysing different soil types for their different soil properties. vi) The teacher checks the components of the chart/ leaflet of the soil management strategies design that meet the requirements of the soil ecosystem services and landscape functions of their community. vii) The teacher converses and checks using the psychomotor skills checklist (for Imitation, manipulation, precision, articulation and naturalisation) and a scoring grid with a scale of 1 –4 when making both liquid and solid organic fertilisers using locally available materials.
ICT support to the suggested learning activities to leverage resource efficiency as the learners can actively participate and engage in activities without limitation (as many times as possible) 1) Use mobile apps like Google Forms or Survey123 to collect data about the soil samples, including location, soil type, and other relevant information to systematically record and organize data, ensuring accuracy and ease of analysis.		

2) Take photos of the sampling sites and soil samples using smartphones or digital cameras. Upload these images to a shared online platform like Google Drive or Microsoft OneDrive to keep a detailed record of their work and provides a reference for analysis and reporting.
3) Research soil analysis protocols and best practices using online resources, academic journals, and agriculture soil systems databanks to gain a deeper understanding of soil science and learn to evaluate and apply information from credible sources.
4) Use platforms like Google Classroom or Microsoft Teams for group discussions, sharing data, and collaborative report writing to enhances teamwork and communication skills
5) Use the internet to research soil profiles, types of soil, and their characteristics to gain a deeper understanding of soil science and the importance of different soil layers.
6) Use smartphones or digital cameras to document the process of creating the edible soil profile cup. Students can take photos at each stage and upload them to a shared online platform like Google Drive or OneDrive to keep a detailed record of the work and provides material for the poster.
7) Utilize graphic design software like Canva, Adobe Spark, or even PowerPoint to create the poster by taking advantages of templates, design elements, and easy-to-use interfaces for creating visually appealing posters and to develop digital design skills and produce professional-quality posters for a soil profile
8) Watch educational videos on platforms like YouTube or Khan Academy that explain soil profiles and soil science to interact with additional context and visual explanations
9) Use the internet to research soil ecosystem services and landscape functions to gain a comprehensive understanding of soil management principles and practices.
10) Use soil analysis software like SoilWeb or web-based soil surveys to assess soil properties and identify appropriate management practices to learn how to use digital tools for soil analysis and make data-driven decisions on soil management principles and practices.
11) Use simulation tools like the Soil and Water Assessment Tool (SWAT) to model the impact of different soil management strategies on ecosystem services and landscape functions to understand the potential outcomes of their strategies and learn to adjust them based on simulated results.
12) Use the internet to research recipes and methods for preparing organic fertilizers to gain a comprehensive understanding of the principles and best practices for making organic fertilizers.
13) Use smartphones or digital cameras to take photos and videos of the fertilizer preparation process and upload to a shared platform like Google Drive or YouTube to create a detailed record of the work and provides material for presentations and report.
14) Use platforms like Google Workspace or Microsoft Teams for group discussions, sharing ideas, and collaborative work on organic fertilizers in real-time, even if they are in different locations.
15) Use tools like Excel or Google Sheets to record and analyse data on the effectiveness of the fertilizers and track growth rates, plant health, and other metrics to evaluate the impact of the organic fertilizers.
16) Use virtual labs or simulations to explore the chemical processes involved in composting and organic fertilizer production.

CONSTRUCT: CROP PRODUCTION

TOPIC 3: Crop Production and Husbandry

Duration: 90 Periods

Competency: The learner applies evidence-based husbandry practices to ensure optimal quality production.

Learning Outcomes The learner should be able to:	Suggested Learning Activities	Sample Assessment Strategy
i) establish a crop enterprise to demonstrate optimal production practices within the community. (k, u, s, v/a, gs) ii) manage the selected crop to demonstrate optimal production practices within the community. (k, u, s, v/a, gs) iii) apply basic occupational health, safety and environmental protection practices in production of a selected crop. (k, u, s, v/a, gs)	i) In groups, learners prepare the business model canvas of a selected crop enterprise that demonstrates optimal production practices. ii) Learners individually think, then pair-up and share with the class how they can seek permission to acquire land to establish a community-based and an individual crop enterprise and then write a proposal to acquire land for growing a crop. iii) In groups, learners establish a community-based and an individual crop enterprise that demonstrates optimal production practices. iv) As a class, learners prepare a nursery and or field seedbed for a selected crop. v) In groups, learners select, procure and prepare planting materials suitable for the selected crop. vi) Individually, learners plant/sow or transplant seedlings of the selected crop to establish the crop enterprise. vii) As a class or individually, learners perform agronomic practices while observing occupational health and safety practices in growing.	i) The teacher checks for accuracy and coherence of the components of a business model canvas prepared for establishing a crop enterprise. ii) The teacher observes learners with a psychomotor skills checklist as they are preparing a seedbed and nursery bed where necessary for a selected crop. iii) The teacher checks for accuracy and coherence (subject knowledge, organisation, structure, technical correctness, being attractive to the reader and communication effectiveness) of the written proposal to acquire land. iv) The teacher checks and converses with learners using the psychomotor observation checklist (for Imitation, manipulation, precision, articulation and naturalisation) during the establishing of the crop enterprise for optimal production. v) The teacher checks, observes and converses with learners using psychomotor observational checklist (for imitation, manipulation, precision, articulation and naturalisation), affective observational checklist (starting with receiving/ attending to, responding, valuing, organising and characterising) and the 25 steps in the scientific investigation protocol in preparing a nursery bed, preparing planting materials, in planting the crop.

ICT support to the suggested learning activities to leverage resource efficiency as the learners can actively participate and engage in activities without limitation (as many times as possible)

1) Use platforms like Google Workspace or Microsoft Teams for group discussions, sharing ideas, and collaborative work when creating the Business Model Canvas to gain a deeper understanding of the production practices and market dimension.
2) Use tools like Excel, or Google Sheets to analyse data on crop production performance, costs, and revenue for the selected crop.
3) Use the internet to research optimal production practices for the selected crop and best practices for preparing nurseries and seedbeds for the selected crop gain a comprehensive understanding of the steps and techniques involved in to a nursery or seedbed.
4) Use mobile apps or digital platforms like Google Docs or Microsoft OneNote to document the process of preparing the nursery or seedbed, including materials used, steps followed, and observations to develop skills in systematic documentation and record-keeping, which are essential for agricultural research and management.
5) Watch educational videos and tutorials on platforms like YouTube or Khan Academy that explain the process of preparing nurseries and seedbeds.
6) Use mobile apps like PlantSnap, Agrobase, or Garden Answers to identify plant species, diagnose plant health issues, and get recommendations for optimal growing conditions to develop skills in using technology for plant care and management.
7) Use smartphones or digital cameras to take photos and videos of the planting materials and the preparation process and upload these visuals to a shared platform like Google Drive or YouTube to create a detailed record of the work and provides material for presentations and reports.
8) Watch educational videos and tutorials on platforms like YouTube or Khan Academy that explain the process of selecting, procuring, and preparing planting materials.
9) Use the internet to research on the best practices for planting, sowing, or transplanting seedlings
10) Use mobile apps or digital platforms like Google Docs or Microsoft OneNote to document the planting process, including steps followed, materials used, and observations.
11) Use smartphones or digital cameras to take photos and videos of the planting or transplanting process.
12) Watch educational videos and tutorials on platforms like YouTube or Khan Academy that explain the process of planting, sowing, or transplanting seedlings.

SENIOR SIX TERM 2
CONSTRUCT: CROP PRODUCTION

TOPIC 4: Crop Harvesting and Handling

Duration: 31 Periods

Competency: The learner harvests optimal quality crop products for the market.

Learning Outcomes The learner should be able to:	Suggested Learning Activities	Sample Assessment Strategy
i) demonstrate understanding of various harvesting techniques for the selected crop for the market. (k, u, s, v/a, gs) ii) harvest the crop adhering to the local and international regulations for crop harvesting and product safety. (k, u, s, v/a, gs)	i) As a class, learners make a field visit to a farm to observe the harvesting of crops or alternatively, learners interact with a video simulating the harvesting techniques of crops identifying how each method might affect crop quality and yield and write a report or reflective paragraph on the experiences. ii) In pairs or groups, learners analyse a case study (showing crop type, weather conditions, market demand, and available resources) examining the interplay between various factors about harvesting technique based on cost, labour, efficiency, and potential market outcomes. iii) In groups, learners harvest a selected crop observing the protocol and guidelines of food safety and hygiene. iv) In groups, learners engage in a project-based learning task of how can we apply a modern harvesting technique to the selected crop.	i) The teacher checks for accuracy and coherence (subject knowledge, organisation, structure, technical correctness, being attractive to the reader and communication effectiveness) of the report about the visit or reflective paragraph on the video/simulation using a scoring grid of 1 –4 as indicate personal insights gained from the experiences. ii) The teacher checks for accuracy and coherence (subject knowledge, organisation, structure, technical correctness, being attractive to the reader and communication effectiveness) of the synthesis and understanding of the case study highlighting the interplay between various factors about harvesting. iii) The teacher checks and observes learners using a protocol and guidelines for food safety and hygiene which include highlighting the pre-harvest (field sanitation, crop monitoring, workers hygiene); harvest (clean equipment and tools, proper crop product handling, separating contaminated/damaged or good

		crop products); post-harvest (bulking, cleaning, cooling, storage, sanitising, transport, pest control); and personal hygiene (body and handwashing, putting on protective gears and regular health check) . iv) The teacher checks and observes learners using both affective and psychomotor observational checklist as they harvest their own mature selected crop. v) The teacher observes learners with project checklist and scoring rubric.

ICT support to the suggested learning activities to leverage resource efficiency as the learners can actively participate and engage in activities without limitation (as many times as possible)

1) Use the internet to research best practices for agronomic activities and occupational health and safety standards for the selected crop to gain a thorough understanding of agronomic practices and the importance of safety in farming.
2) Use mobile apps or digital platforms like Google Docs or Microsoft OneNote to document agronomic practices, safety measures taken, and observations including data on soil conditions, crop growth, and safety compliance.
3) Use smartphones or digital cameras to take photos and videos of agronomic practices and safety procedures.
4) Use platforms like Google Workspace, Microsoft Teams, or Slack for group discussions, sharing ideas, and collaborative planning of agronomic activities.
5) Use mobile apps like PlantSnap, Agrobase, or Garden Answers to identify plant species, diagnose plant health issues, and get recommendations for optimal growing conditions.
6) Watch educational videos and tutorials on platforms like YouTube or Khan Academy that explain agronomic practices and safety standard to provide additional context and visual explanations.
7) Use digital tools like Google Forms or Peergrade to gather feedback on agronomic practices and safety compliance in the selected crop.

SENIOR SIX TERM 3
CONSTRUCT: VALUE ADDITION FOR THE MARKET

TOPIC 5: Crop and Crop Product Marketing

Duration: 54 Periods

Competency: The learner markets crop and crop products for profit.

Learning Outcomes The learner should be able to:	Suggested Learning Activities	Sample Assessment Strategy
i) perform the required marketing functions on crop and crop products, adhering to the local and international regulations. (k, u, s, v/a, gs) ii) manage cash flows from crop enterprise for sustainability. (k, u, s, v/a, gs) iii) c) apply the cobweb theorem to predict market fluctuations and how to stabilise prices for farmers of crops in their community. (k, u, s, v/a, gs)	i) In groups, learners conduct a market survey to understand consumer preferences and the local or international regulatory requirements of the selected crop or crop product including making a report or a leaflet. ii) In pairs, learners analyse case studies with details on the enterprise's financial strategies, cash flows, challenges faced, and the outcomes achieved to identify the key factors that contributed to the crop enterprise's financial success. iii) In groups, learners analyse a case study and apply the cobweb theorem to predict market fluctuations.	i) The teacher checks for accuracy and coherence of the report (subject knowledge, organisation, structure, technical correctness, being attractive to the reader and communication effectiveness) for analysis of market trends, consumer demands and regulatory requirements and including the recommendations about marketing their assigned crop or product. ii) The teacher checks for accuracy and coherence (subject knowledge, organisation, structure, technical correctness, being attractive to the reader and communication effectiveness) of the synthesis and understanding of the case study highlighting how they can apply the lessons learned to their own marketing efforts. iii) The teacher checks for accuracy and coherence (subject knowledge, organisation, structure, technical correctness, being attractive to the reader and communication effectiveness) of the synthesis and

		understanding of the case study highlighting how the cobweb theorem explains how prices adjust in response to changes in supply and demand of crop and crop products.

ICT support to the suggested learning activities to leverage resource efficiency as the learners can actively participate and engage in activities without limitation (as many times as possible)

1) Use the internet to research the specific crops and harvesting techniques of the selected and established crop.
2) Use smartphones or digital cameras to take photos and videos of the harvesting process then upload to a shared platform like Google Drive or YouTube for later review and analysis.
3) Watch educational videos and tutorials on platforms like YouTube or Khan Academy that explain the harvesting process and techniques.
4) Arrange for virtual guest speakers who are experts in crop harvesting to give talks and answer questions before or after the field visit.
5) Use tools like MindMeister or Miro to create interactive mind maps that organize key factors, strategies, and challenges identified in the case studies to help in understanding connections and relationships.
6) Use the internet to research the cobweb theorem, its principles, and real-world applications in crop production.
7) Arrange for virtual guest speakers who are experts in economics and market analysis to give talks and answer questions about the cobweb theorem and market fluctuations.

3.0 ASSESSMENT

3.1 Overview of Assessment

In a competency-based learning model, assessment focuses on checking and evaluating learners' mastery of specific skills and knowledge rather than their performance on traditional tests and assignments. This approach uses a variety of assessment methods, including scientific investigation, projects checklist, and reflective activities, to measure learners' abilities to apply their learning in real-world or real-life contexts.

Since teaching and assessment have the same purpose —to help individuals learn —teachers need to plan them as complementary aspects of one activity. Teachers can use different assessment types to gather information. They can use this information for a variety of purposes, including:

Purpose of assessment			
Diagnostic	**Formative**	**Summative**	**Evaluative**
To identify strength and areas of improvement and to inform the next steps.	To use assessment information to make specific improvements in learning.	To acknowledge, record and report learners' overall performance and achievement at a point in time.	To inform curriculum planning and to provide information for monitoring and accountability.

This means that assessment is the cornerstone of good learning and teaching. It can make a vital contribution to improving educational outcomes for all learners. It is about collecting, interpreting and using information to give a deeper appreciation of what individuals know and understand, their skills and capabilities, and what their learning experiences enable them to do. This suggests what the teacher must include as shown below:

Making assessment an integral part of daily mathematics instruction is a challenge. It requires planning specific ways to use assignments and discussions to discover what students do and do not understand. It also requires teachers to be prepared to deal with students' responses. Merely spotting when students are incorrect is relatively easy compared with understanding the reasons behind their errors. The latter demands careful attention and a deep knowledge of the mathematics concepts and principles that students are learning… The insights we gain by making assessment a regular part of instruction enable us to meet the needs of the students who are eager for more challenges and to provide intervention for those who are struggling.
Burns 2005, p. 31

Assessment is part and parcel of the teaching and learning process, facilitating learning and improving instruction, and can take a variety of forms. Among the different forms is classroom-based assessment. Classroom-based assessment in competency-based learning (CBL) is a continuous, formative, and learner-centred process. It evaluates learners' mastery of specific skills and knowledge during teaching and learning. As a result, classroom assessment is generally divided into three types: assessment *for* learning, assessment *of* learning and assessment *as* learning.

Assessment for Learning

Assessment *for* learning is the ongoing assessment that allows teachers to monitor learners on a day-to-day basis and modify their teaching based on what the learners need to be successful. This assessment provides learners with the timely, specific feedback that they need to make adjustments to their learning.

> *After teaching a lesson, we need to determine whether the lesson was accessible to all students; what is still challenging to the more capable; what the students learned and still need to know; how we can improve the lesson to make it more effective; and, if necessary, what other lesson we might offer as a better alternative. This continual evaluation of instructional choices is at the heart of improving our teaching practice.*
> **Burns 2005, p. 26**

Assessment of Learning

Assessment *of* learning is the snapshot in time that lets the teacher, learners and their parents know how well each learner has completed the learning tasks and activities. It provides information about learner achievement. While it provides useful reporting information, it often has little effect on learning.

Assessment as Learning

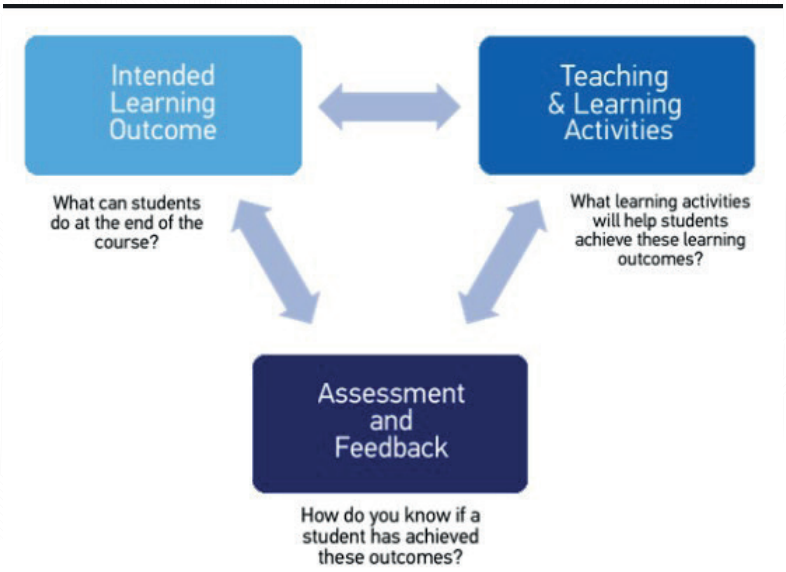
Assessment as learning is an approach that involves learners in self-assessment, reflection, and goal-setting about their learning.

3.2 Assessment in Competency-Based Learning

In Competency-Based Learning (CBL), assessment serves as a transformative tool that extends beyond measuring learners' knowledge to ensuring they can apply their skills and knowledge effectively in real-world contexts. At the heart of CBL assessment lies the evaluation of learners' mastery of specific learning outcomes through diverse, authentic methods such as projects, simulations, and practical applications.

This approach prioritises continuous, actionable feedback, empowering learners to track their progress, identify areas for improvement, and take ownership of their learning journey. This paradigm shifts from traditional, one-size-fits-all assessment to a more dynamic, learner-centred approach is crucial for fostering profound, lasting learning experiences.

This assessment is designed and administered to have a predominantly formative function, as well as a summative function. This assessment is based on the model below.



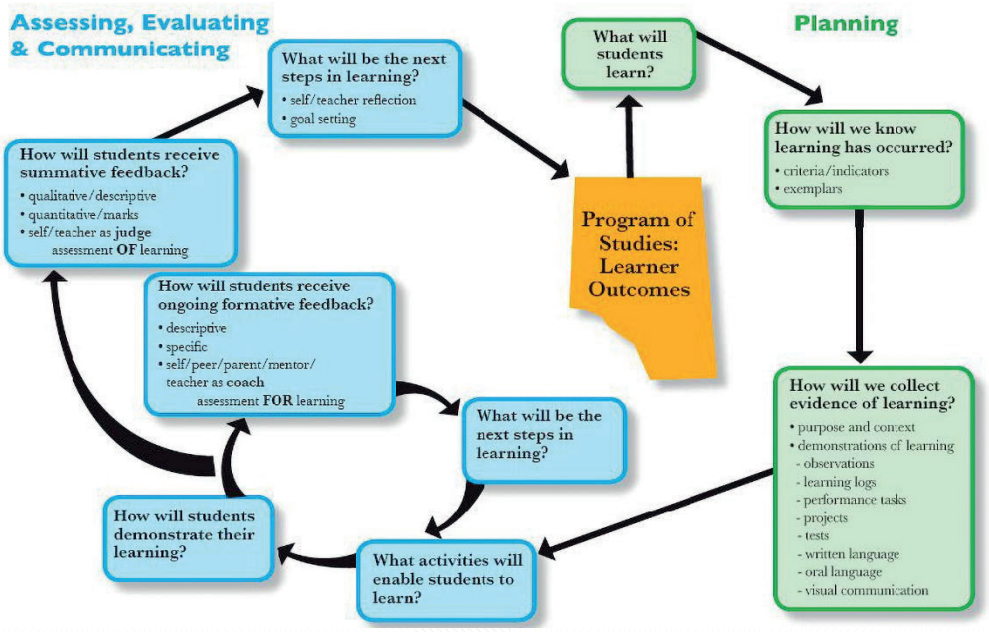
3.3 Formative assessment

In this aligned curriculum, the teacher's assessment role is not to write tests for learners, but to make professional judgements about learners' learning in the course of the normal teaching and learning process. The professional judgement is about how far the learner achieves the learning outcomes that are set out in this syllabus. To make these judgements the teacher needs to look at how well the learners are performing in terms of each learning outcome.

Formative assessment is where the facilitator supports learners by guiding and mentoring them to achieve expertise. It will require the facilitator to sit beside the learners to make them as good as the expert. Therefore, assessments should provide multiple opportunities for direct observations within learning spaces and diverse practice settings. The facilitator will evaluate the learners' current status, identify their needs, and chart a pathway for their development. The facilitator will check and judge where the learner is. The primary focus should be on direct observation and conversation within these learning environments. Ultimately, learners will produce tangible outcomes as evidence of their progress.

Formative assessment involves using all parts of the cycle and triangle below. This means that the process of teaching and learning in some way can be seen in the triangle as explained below.

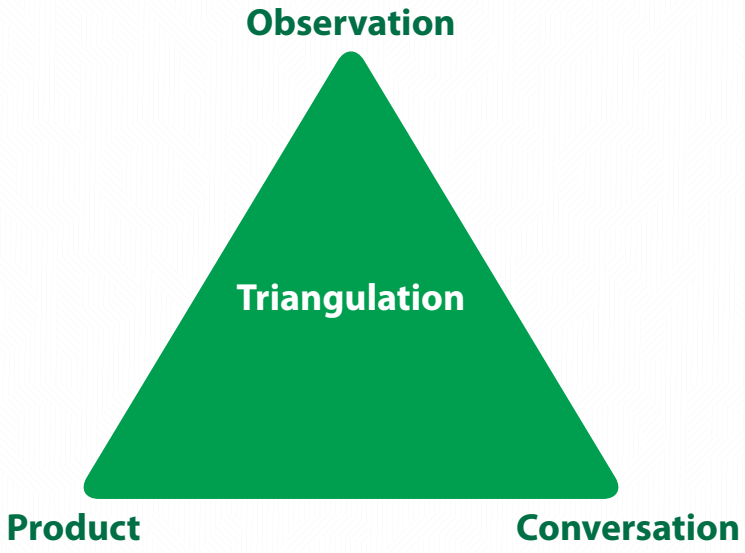
Assessing Student Learning in the Classroom



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

a) **Observation** —watching learners working (good for assessing skills, values and attitudes)
b) **Conversation** —asking questions and talking to learners (good for assessing knowledge and understanding)
c) **Product**—appraising the learner's work (writing, report, translation, calculation, presentation, map, diagram, model, drawing, painting etc.). In this context, a "product" is seen as something physical and permanent that the teacher can keep and look at, not something that the learner says.

When all three opportunities of observation, conversation and obtaining a product 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" as shown below.



In the new agriculture teaching syllabus, the facilitators' role is to make professional judgements about learning by employing triangulation above. The professional judgement is about how far are the learners meeting the learning outcomes that are set out in the syllabus.

To make these judgements the facilitator need to do the following:

i) **Observation**

Intentional and careful observation is fundamental to teaching, learning, and assessment. It prompts us to question what we observe by asking what, why, how, where, when, and who. Similarly, facilitators employ these questions while observing their learners, seeking answers to better support and scaffold their development. In this approach you observe learners as they solve problems, model skills to others (psychomotor), think aloud during a sequence of activities. It also involves facilitators observing learners' behaviour (affective) as they interact with peers in different learning situations to provide insight into their values and attitudes. This enable a facilitator to find out under what conditions success is most likely, what individual learners do when they encounter difficulty, how interaction with others affects their learning and concentration, and what learners need to learn the next idea or concept. Observations may be informal or highly structured, and incidental or scheduled over different periods of time in different learning contexts.

ii) **Conversation**

In the teaching and learning process, dynamic conversations between facilitators and learners play a vital role in fostering deep understanding, critical thinking, and intellectual curiosity. Facilitators engage learners through strategic questioning, posing challenging inquiries that prompt deeper exploration, reflection, and analysis. These questions are carefully crafted to scaffold learners' thinking, facilitating connections between new information and prior knowledge, reinforcing existing concepts, and addressing misconceptions. Through this iterative, dialogic process, learners not only enhance their comprehension but also develop the skills to articulate their thoughts, reasoning, and problem-solving strategies. As a result, learners are guided toward higher-order thinking, nuanced understanding, and a more profound mastery of the concepts. Therefore, facilitators are encouraged to ask questions and talk to learners as and when deemed fit.

iii) **Product**

In the context of teaching and learning, it is essential for facilitators to obtain tangible products from learners who engage in each learning activity to ensure a thorough understanding of the concept. These products—whether they are written reports, presentations, project products and services, or creative works—serve as concrete evidence of the learners' comprehension and application of the material. By producing a tangible outcome, learners not only reinforce their knowledge but also demonstrate their ability to synthesise and utilise what they have learned in a meaningful way. This process allows facilitators to assess learners' progress, identify any areas of misunderstanding, and provide targeted feedback to support continued growth and mastery.

iv) **Assessment for developing scientific investigation skills**

Agriculture, as an applied science, is pivotal in addressing the pressing global challenges of food security and sustainability. To drive innovation and enhance practices, agricultural education and practice must place a strong emphasis on scientific inquiry, investigation skills, and evidence-based decision making. By seamlessly integrating scientific investigation, experimentation, and data analysis, we can foster the development of more efficient, sustainable, and resilient farming techniques, ultimately ensuring a food-secure future for generations to come. Therefore, agriculture instruction and assessment should be designed to teach and measure the science concepts, scientific methods and how individuals make objective observation to think and learn as scientists. Learners will engage in scientific investigation. Scientific investigation is a plan for finding the answers to a question using scientific thinking. There are a number of scientific investigation but here we shall limit it to observational (using the five senses to study something closely) and experimental (uses an experiment to answer questions or where the scientist changes a situation to see what happens). With this experience the scientist makes decisions. Likewise, in modern society, learners must routinely formulate questions, test ideas, collect and analyse data, support arguments with evidence, and collaborate with peers before making informed decisions. By doing that the learner is engaging in science inquiry skills and scientific methods. This will cover how to observe, predict, check, record and communicate.

The integrated character of scientific knowledge and how science is practiced is being emphasised. For that reason, helping learners engage in scientific inquiry and develop science inquiry skills in the context of learning science is one of the most important goals of science education. Such demand has made assessment of scientific investigation skills to use rubrics like this shown below.

Award	Detailed description of actions made
Score 4	Elaborates in details the connections between two or more science skills including how they can apply it in new and unfamiliar situations
Score 3	Links a science skill to its importance in real-life by explaining at least one scientific thinking or approach and investigation skill
Score 2	Lists one or more specific science skills like the way it was given and stated with limited explanation as mere facts
Score 1	Lists the general academic skills because was familiar and present but without linking them to their importance or application in real-life

3.4 Project-based Learning Assessment

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

Project-based learning is a unit of teaching and learning activity on a concept or topic. This unit is launched or started by using an interest approach or anchor. A launch of a Project-Based Learning (PBL) unit is an exciting and crucial phase that sets the tone for the entire project. It aims at engaging the learners or participants, build their interest, and provide a clear understanding of the project's goals and expectations. This activity must be launched by the facilitator. During project-based learning launch you capture the learner's interest and curiosity. Start with a compelling activity, such as a video, guest speaker, text extracts or dramatic simulation that introduces the unit. It has the following dimensions for the facilitators to work with:

a) **Hook/grabber:** is an engaging and thought-provoking introduction. It is intended to capture the reader or learners' attention, spark their curiosity and motivate them to learn. It uses interesting facts, statistics or scenarios. For example, you can make a contextual visit to a site where the concept is manifested or you can show a video about the impact of plastic pollution on marine life.

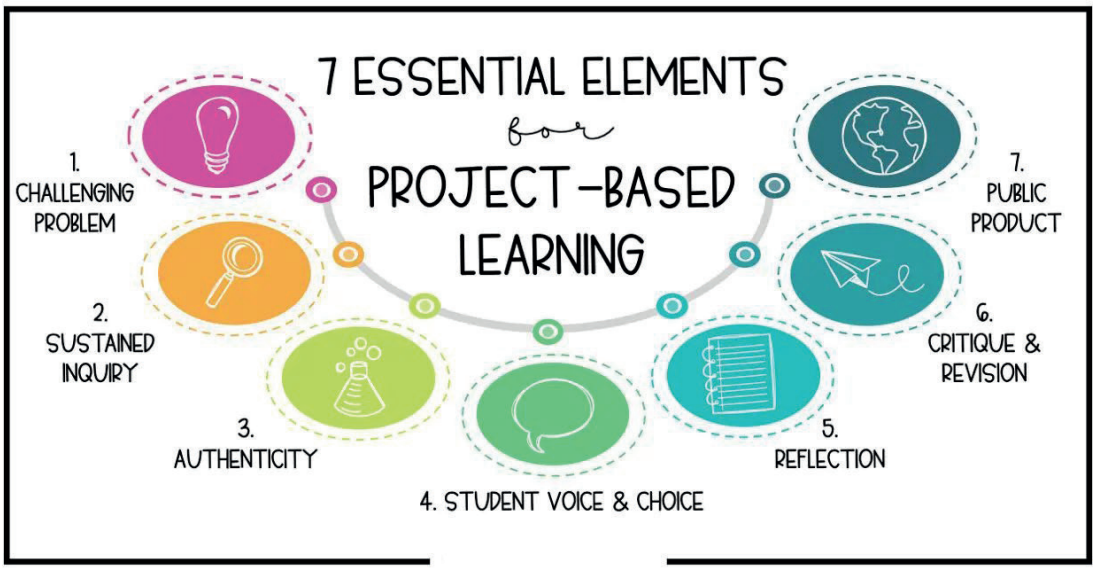
b) **Driving Question example:** This is an open-ended, thought-provoking question that guides and focuses the learning process of particular concept. For example, "How can we reduce plastic waste in our school and community?"

c) **Project based learning overview/background:** This explains the project-based learning phases, from past experiences and existing knowledge about the concepts, so that learners can generate inferred questions to lead them into action plans, then go into producing of products or services before making presentations to an audience.

d) **Group Formation:** This is a process of creating and establishing teams for learners to work on the task. Therefore, you need to create groups, allocate participants to teams and ask them to assign roles to team members like information gathers, designer, and spokesperson or communicator.

Facilitators or teachers designing true PBL units must take conscious effort to incorporate all the seven design elements of:

1) **A driving question or challenging problem**
This should be aligned and originating from the teaching standards or curriculum concepts being taught.



2) **Sustained inquiry**; where the participants will be engaged in a rigorous, extended process of generating and responding to inferred question, posing as many questions, finding and applying information of a period of time.

3) **Authenticity;** where it demands participants to engage in real-world contexts, tasks, tools, market and quality standard and speaking to personal concerns, interests and issues.

4) **Aligned to the teaching standards and learning outcomes;** means ensuring that the project is designed to meet specific learning outcomes in the curriculum.

5) **Learner's voice and choice;** Learner's voice and choice in project-based learning (PBL) empower learners by giving them a say in their learning journey.

This approach encourages learners to actively participate in using the driving question to the plan, execute, and evaluate of their activities in the project-based learning task. Learners will be given space to make choices in tasks or activities, methods of work, and the value proposition for the product or service they want to work on. In that way learners can pursue their interests and leverage their strengths, fostering a deeper engagement and ownership of their learning. This autonomy not only enhances motivation and creativity but also builds critical skills like decision-making, problem-solving, and self-management, preparing learners for real-world challenges. Therefore, facilitators should create space for learner's voice and choice to thrive.

6) **Critique and revision;** which involves giving and receiving feedback on a project task and activities. The goal is to provide constructive insights that can help improve access to deeper learning, the project's experiences, and product quality. Critique can come from teachers, peers, or experts in the field. The feedback should be specific, actionable, and focused on how to improve the work rather than just pointing out what is wrong. While revision is the process of making changes to a project processes and product based on the feedback received during the critique phase. This iterative process helps learners refine their work and achieve higher quality outcomes.

7) **A Public Product and Exhibition:** A **Public Product** is a tangible outcome or deliverable created by learners as part of their effort to address the driving question. An **Exhibition** is an event where students present their public products to an audience. This event can take various forms, such as presentations, fairs, showcases, or online galleries. This element involves sharing learners' work with an audience beyond the classroom.

3.5 Assessing Generic skills

The generic skills have been built into the syllabuses and are part of the learning outcomes. It is therefore not necessary to assess them separately. It is the increasingly complex context of the subject content that provides progression in the generic skills, and so they are assessed as part of the subject learning outcomes.

Generic skills have been built into the agriculture syllabus and are part of the different learning outcomes. These skills manifest them as part and parcel of the ideas and concepts being taught in a competency-based learning and knowledge integration framework.

For that reason, assessing generic skills will entail evaluating learners' proficiency in applying these essential skills such as communication, collaboration, creativity, critical thinking, mathematical computation and ICT proficiency within an authentic, real-world context. The facilitators will do this by the help of **an observation checklist and scoring rubric**.

Attitudes and values

You can assess values and attitudes. According to Krathwohl, Bloom, and Masia (1973), the affective domain refers to how we interact with objects emotionally, such as feelings, values, admiration, excitement, motivations, and attitudes. Therefore, you can observe how learners interact with peers and teachers, noting examples of empathy, respect, and cooperation. This means that values and attitudes can be assessed over a long period of time through observing and interactions.

For that reason, attitudes and values have been built into the agriculture syllabus and are part of the different learning outcomes. The aspects of learning attitudes and values, well known as affective domain attributes, are inherently integrated into the teaching and learning process within a competency-based learning and knowledge integration framework. Like the generic skills above, they will be assessed using an **observation checklist and scoring rubric.**

3.6 Summative Assessment

There are three points across the curriculum where a summative assessment is performed to make collective formal decisions on competency attainment. This a progression landscape which includes developing trust of the learner to demonstrate competency reliably in increasingly complex situations and in different contexts/environments.

a) **End of topic assessment**

This is an assessment administered to learners or individuals who have been **taught and have experienced different learning activities in a given topic/concept**. It requires a learner to have participated or engaged in different sessions/lessons where co-creation has occurred. The learners should have constructed their own knowledge which makes meaning to them from the experiences received during the different activities they have been exposed to under the topic/concepts and stimulus materials. For example, if one wants to have breakfast with a dish of *Katogo* or sandwich. What would you do to prepare or make any of these dishes? Learners shall unbundle, re-bundle and bundle chunks of knowledge.

The key characteristics of an activity of integration

i) **Complex:** that learning can take different forms and can be expressed in different ways. So, facilitators should place less emphasis on any single indicator of learner achievement. Further there is the butterfly effect where a wide variety of things seemingly unrelated to the topic come into play to achieve the learning desired. Therefore, no lesson will follow a linear model or ever go completely as planned and will have the same effect on each person so that they respond in the same way. This is because learners enter your learning space of chaos which will in turn elicit different reactions and perceptions among them. Therefore, those who feel comfortable with order, rigid rules and reason with symmetry, equilibrium and stasis, will find life and creating activity of integration with dynamic complexity quite challenging. On the other hand, those who are comfortable with being part and in the process, the flow of the changed system, those who can see the larger patterns or global picture beyond what they know and used to, those who can tolerate ambiguity and unpredictability, those who find being in a complex experience at the edge of the chaos to be in a stimulating and rewarding opportunity will be good in the task to create the desired.

ii) **Complexity** comes in when narrating the situation to give you a paragraph (and more) or a web of sentences on the topic integrating/putting together what seem not to be related and representing it as it is in real-life and painting that picture for the respondent as an activity of integration/situation or scenario.

iii) **Perplexing or puzzling and ambiguous:** that it is confusing and you do not know exactly where to start or what it is about. This makes it to demand critical thinking and high order thinking skills (HOTS).

iv) **Novel:** that it is a long narrative which is original and striking from a real life or an imaginary event with a society challenge/issue/problem to be identified after deep thinking.

b) **End of year assessment**

Assessing intermediate knowledge integration competency by the end of year will involve a comprehensive evaluation of a learner's progress in mastering specific skills and knowledge areas within a broader concept or construct. These periodic, end-of-year assessments enable facilitators to pinpoint areas of excellence and identify gaps where targeted support or instruction is required. Ultimately, the goal of these assessments is to ensure learners are progressively building the necessary learning outcomes, step by step, to achieve the knowledge integration that comprise the overall construct.

c) **End of cycle assessment**

Assessing terminal knowledge integration competency focuses on evaluating a learner's ability to synthesise and apply all the knowledge and skills acquired throughout the learning experience in a comprehensive and cohesive manner. Here the emphasis will be mainly on the learner's ability to apply their learning in new and unfamiliar situations. Consequently, this assessment will come in form a final examination at the end of Senior 6. It follows the assessment of the construct in the subject as indicated in the Assessment Framework.

d) **Examinations**

There will be only one school based summative assessment at the end of the year. There will no longer be examinations or tests set at the beginning and end of every term. Instead, there will be a summing up of on-going teacher assessments made in the context of learning through activities of integration assessment. Learners will also be subjected to the end of cycle assessment for certification. Details on the end of cycle assessment are provided in the assessment guidelines document or the assessment framework.

e) **Examination Authority**

The Advanced Agriculture syllabus shall be examined by the established and relevant examination bodies including Uganda National Examination Board.

3.7 Record Keeping

In competency-based learning, accurate and comprehensive record keeping is crucial for tracking learners' progress and achievements. Therefore, the teacher and the school **must keep accurate records about learners' achievement.**

Various assessment tools and strategies are employed to capture learners' demonstration of abilities and achievements, including observation checklists, scientific investigation rubrics, project-based learning rubrics, and end-of-topic/end-of-year scoring grids. These tools provide a holistic picture of learners' strengths, weaknesses, and areas for improvement.

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

It is important to note that portfolios serve as a comprehensive record of learners' achievements, progress, and growth over time. By analysing the data and evidence contained within the portfolios, educators can identify areas where learners require additional support, provide targeted interventions, and make informed decisions.

i) Checklists

Checklists are an efficient and practical way to collect information about a learner's development. Checklists are based on "assessors' norms" as determined by development theorists. With each age range and year, there are certain expectations and skills that a learner should be able to achieve. For that reason, checklists are designed to track a learner's skills in all the developmental domains including physical, cognitive, language, social and emotional.

With a checklist, teachers and facilitators can easily see what a learner can do, as well as note what areas of development need further support. Teachers and facilitators can create their own checklists based on certain skill sets. Consequently, these checklists can be used to track a large group of learners or an individual learner**.** Once the checklists are completed, they can be analysed and stored for future reference.

ii) Portfolio

A portfolio is a thoughtful and intentional collection of a learner's outputs, projects, and assessed tasks. It serves as a valuable tool for learners to track, document, and reflect on their academic progress over time. Learners take ownership of their portfolio by selectively including achievements that demonstrate their growth and accomplishments. While learners drive the curation process, facilitators may provide guidance and recommendations on which pieces to include, ensuring the portfolio accurately reflects the learner's step-by-step progress. Portfolios can be created in various formats, either manually or digitally, depending on available resources**.**

iii) Anecdotal notes

Anecdotal notes serve as a valuable tool for recording specific, contextualised observations of individual learners' behaviours, skills, and attitudes as they relate to competency and learning outcomes in a subject. These narrative notes, often written during or immediately after lessons and activities, provide cumulative insights into a learner's progress, informing facilitators' instruction and guiding further development. Anecdotal notes may incorporate scoring grids, checklists, and written responses to performances, products, or services, offering a comprehensive and accurate record of learners' achievements. By documenting observations in a timely manner, facilitators can ensure that anecdotal notes remain a reliable and informative, checklist records and completed assignments.

iv) Learners' manual files

Learners' manual files are used to store learners' academic achievements, including scores, checklist records and completed assignments. These files also contain records of learners' participation in extracurricular activities, awards, and recognitions they have received.

Additionally, they include notes and observations from teachers regarding learners' progress, behaviour, and areas of improvement. Finally, these stored records are essential tools for teachers, administrators, and parents to monitor and support the learners' educational development and academic journey

Annex 1: Scientific Inquiry Process During Investigation

i) The learner observes objects or phenomenon; observation is the first step in scientific inquiry.

ii) The learner wonders or gets bothered/perturbed; curiosity drives the formulation of questions.

iii) The learner formulates their own investigation questions; asking specific questions to guide the investigation.

iv) The learner proposes a tentative answer; formulating an initial understanding or possible answer.

v) Learner formulates a hypothesis; developing a testable hypothesis based on the tentative answer.

vi) The learner identifies the variable in the investigation; identifying independent, dependent, and control variables.

vii) The learner designs an experiment; planning the experiment to test the hypothesis.

viii) The learner gives a title to the experiment; providing a clear, concise title that reflects the experiment's aim.

ix) The learner gathers the materials, tools and equipment; assembling necessary materials and equipment.

x) The learner follows occupational health, safety and environmental protection practices; ensuring safety and environmental care during the experiment.

xi) The learner formulates the steps to follow or procedure for investigation; writing a detailed procedure for conducting the experiment.

xii) The learner describes how data or information will be gathered; planning methods for data collection.

xiii) The learner creates format to capture the data or information; Designing formats like tables or charts to record data.

xiv) The learner presents the data or information using statistical approaches: analysing data using statistical methods.

xv) The learner interprets the data or information by relating the two variables; drawing connections and interpreting the relationships between variables.

xvi) The learner extrapolates the results; extending findings to make broader generalisations.

xvii) The learner draws conclusion about the relationships; summarising the relationships observed in the data.

xviii) The learner formulates supports for their conclusion; providing evidence and reasoning to back up conclusions.

xix) The learner relates the hypothesis to the conclusion; connecting the results back to the original hypothesis.

xx) The learner identifies the difference between the plan and the execution of the experiment; noting any deviations from the original plan.

xxi) The learner explains reason(s) for any difference or in absence of difference gives suggestions to improve the investigation/experiment; discussing reasons for any discrepancies and offering improvements.

xxii) The learner gives suggestions to extend the investigation; proposing further research or additional questions for exploration.

xxiii) The learner draws conclusion related to the context; linking conclusions to the broader context of the study.

xxiv) The learner cleans up all tools, equipment, and the working area then dispose of any waste materials, especially if they are hazardous and return all materials and equipment to their proper storage locations; ensuring a clean and safe working environment post-experiment.

xxv) The learner communicates; sharing findings through reports, presentations, or publications.

Scientific Investigation Preparation and Planning

Award	Description of actions made
Score 1	i) Develops a basic hypothesis based on the topic that states simply what they wish to find out ii) Produces a simple plan using limited scientific knowledge iii) Identifies a limited list of apparatus/equipment requirements and a suitable practical technique with limited detail iv) Provides a basic justification for the choice of research methods v) Carries out a basic risk assessment by identifying at least one hazard vi) Spelling, punctuation and grammar (future tense) are used with some accuracy so that the meaning is sometimes clear
Score 2	i) Develops a satisfactory hypothesis, with scientific reasoning, as to the outcomes of the investigation ii) Produces a satisfactory plan, using appropriate scientific knowledge. iii) Identifies apparatus/equipment and an appropriate technique that will obtain a range of results iv) Provides a satisfactory justification for the choice of research methods v) Carries out a satisfactory risk assessment by identifying two hazards. vi) Spelling, punctuation and grammar are used with reasonable accuracy so that the meaning is reasonably clear
Score 3	i) Develops a good hypothesis, with good scientific reasoning, as to the outcomes of the investigation ii) Produces a detailed plan using a good level of scientific knowledge iii) Identifies equipment/apparatus and a practical technique that will produce accurate results iv) Provides a good justification for the choice of research methods v) Carries out a good risk assessment, including suggesting how to minimise risks vi) Spelling, punctuation and grammar are used with considerable accuracy so that the meaning is clear
Score 4	i) Develops a detailed hypothesis with detailed and scientific reasoning as to the outcomes of the investigation ii) Produces a complex plan using a high level of detailed scientific knowledge iii) Identifies equipment/apparatus and more than one practical technique to produce a range of accurate results iv) Provides a detailed justification for the choice of research methods v) Carries out detailed risk assessment and identify how to minimise each risk and what to do in the event of an incident vi) Spelling, punctuation and grammar are used with almost faultless accuracy so that the meaning is clear

Scientific Investigation Data Collection

Award	Description of actions made
Score 1	i) Carries out some parts of the investigation while displaying limited practical skills ii) Shows limited understanding of health and safety issues iii) Obtains and records limited data that may not be accurate iv) Records at least three readings, that may not be accurate v) Spelling, punctuation and grammar are used with some accuracy so that the meaning is sometimes clear
Score 2	i) Carries out most parts of the investigation displaying satisfactory practical skills ii) Demonstrates satisfactory understanding of health and safety issues iii) Obtains and records a satisfactory number of measurements and/or observations of variable quality iv) Records at least four readings and/or observations of variable quality v) Spelling, punctuation and grammar are used with reasonable accuracy so that the meaning is reasonably clear
Score 3	i) Carries out all parts of the investigation, displaying good practical skills ii) Demonstrates a good understanding of health and safety issues including at times identifying potential risks and taking appropriate precautions iii) Obtains and records a complete set of measurements and/or observations using appropriate precision iv) Spelling, punctuation and grammar are used with considerable accuracy so that the meaning is clear
Score 4	i) Carries out all parts of the investigation independently displaying an excellent level of technical skills ii) Demonstrates a high level of understanding of health and safety issues including identifying potential risks and taking appropriate precautions iii) Obtains and records a complete set of accurate measurements and/or observations using a high degree of precision iv) Spelling, punctuation and grammar are used with almost faultless accuracy so that the meaning is clear

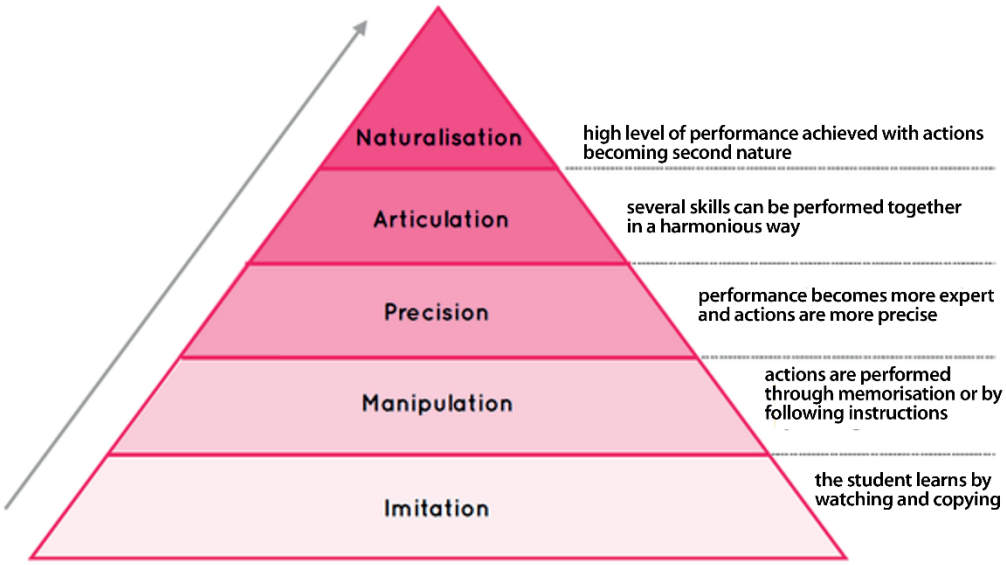
Scientific Investigation Analysis and Conclusion

Award	Description of actions made
Score 1	i) Produces a basic set of results presented using an appropriate statistical method like in a table and identifies a trend in their results ii) Uses a simple graph/chart to display data iii) Produces a basic conclusion that may not be linked to the data or hypothesis iv) Spelling, punctuation and grammar are used with some accuracy so that the meaning is sometimes clear
Score 2	i) Produces a satisfactory set of results presented in an appropriate table and identifies at least one trend in their results ii) Uses an appropriate graph/chart, with labelled axes, to display the data obtained iii) Gives a satisfactory conclusion linked to their data or hypothesis, but using data to support their conclusion iv) Produces a conclusion that is linked to the data or hypothesis v) Spelling, punctuation and grammar are used with reasonable accuracy so that the meaning is reasonably clear
Score 3	i) Produces an accurate set of results presented in a table with appropriate headings and units and use of one form of mathematical technique to process the data ii) Identifies appropriate trends in their results iii) Uses a graph/chart with labelled axes, units and headings to display data iv) Displays data in a graphical form with labelled axes including units and headings v) Produces a good conclusion linked to the data and hypothesis vi) Spelling, punctuation and grammar are used with considerable accuracy so that the meaning is clear
Score 4	i) Produces a comprehensive and accurate set of results presented in a table with appropriate headings and units ii) Uses more than one mathematical technique to process the data and identifies trends in their results iii) Uses a range of graphs to display data, using appropriately labelled axes, units and headings iv) Produces detailed conclusions with reference to relevant data and hypothesis using relevant data to support their conclusions v) Displays data in at least two graphical forms with labelled axes including units and headings vi) Spelling, punctuation and grammar are used with almost faultless accuracy so that the meaning is clear

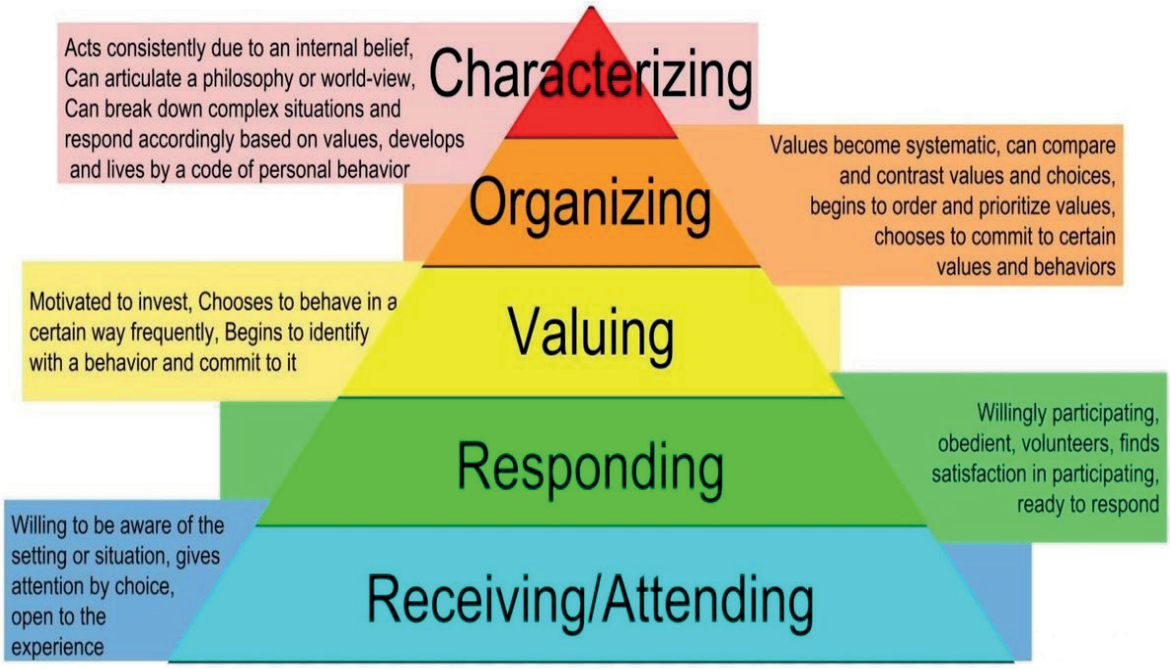
Scientific Investigation Evaluation

Award	Description of actions made
Score 1	i) Provides a brief evaluation of the investigation, making limited or no reference to the reliability of the results ii) Gives a simple suggestion as to how they could improve the methodology iii) Gives a basic suggestion for further research that may be relevant to the investigation iv) Spelling, punctuation and grammar are used with some accuracy so that the meaning is sometimes clear
Score 2	i) Provides a brief evaluation of the investigation, including some reference to the reliability of the results ii) Gives a suggestion as to how they could improve the methodology. iii) Gives an appropriate suggestion for further research that is relevant to the investigation iv) Spelling, punctuation and grammar are used with reasonable accuracy so that the meaning is reasonably clear
Score 3	i) Provides an evaluation that considers the processes, techniques and risk assessment used and identifies anomalous results and consider the reliability of the data obtained ii) Provides relevant suggestions as to how they could improve the methodology iii) Gives suggestions for further research that are relevant to their investigation iv) Spelling, punctuation and grammar are used with considerable accuracy so that the meaning is clear
Score 4	i) Provides a detailed and thorough evaluation of the processes, techniques and risk assessment used, giving in depth consideration to the reliability and validity of the data produced and details of any anomalous results ii) Provides detailed suggestions as to how they could improve the methodology iii) Provides detailed suggestions for further research that are relevant to their investigation iv) Spelling, punctuation and grammar are used with almost faultless accuracy so that the meaning is clear

Annex 2: Dave's psychomotor observation checklist triangle



Annex 3 Krathwohls affective domain observation checklist triangle



Glossary of Key Terms

Term	Meaning
competence	This is the ability of a person to do something.
competency	This is the ability of a person to apply their learning with confidence in a range of situation.
competent	This is being able to mobilise a set of resources in order to solve a contextualised problem that belongs to a family of such.
competency-based education	This is the education that focuses on the integration and synthesis of information, concepts and experiences to create a working knowledge that can be use in a real-world setting.
construct	This is a specific generalisation of different concepts put together that learners are expected to learn and demonstrate mastery of so that they function in real-life.
formative assessment	Formative assessment is where the facilitator supports learners by guiding and mentoring them to achieve expertise.
learning outcomes	These are the specific skills, knowledge and attitudes that learners are expected to acquire and demonstrate in real-life.
knowledge integration	This is the process of connecting, relating and unifying concepts in various situations as deemed fit in real-life.
value chain	These are series of activities and processes that add value to agricultural products from production to consumption.
generic skills	These are the transferable skills, attitudes and values that are essential in real-world.
process skill	A capability acquired by following the programme of study in a particular learning area; enables a learner to apply the knowledge and understanding of the learning area.
sample assessment activity	An activity which gives a learner the opportunity to show the extent to which s/he has achieved the learning outcomes. This is usually part of the normal teaching and learning process and not something extra at the end of a topic.
suggested learning activity	An aspect of the normal teaching and learning process that will enable a formative assessment to be made.

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