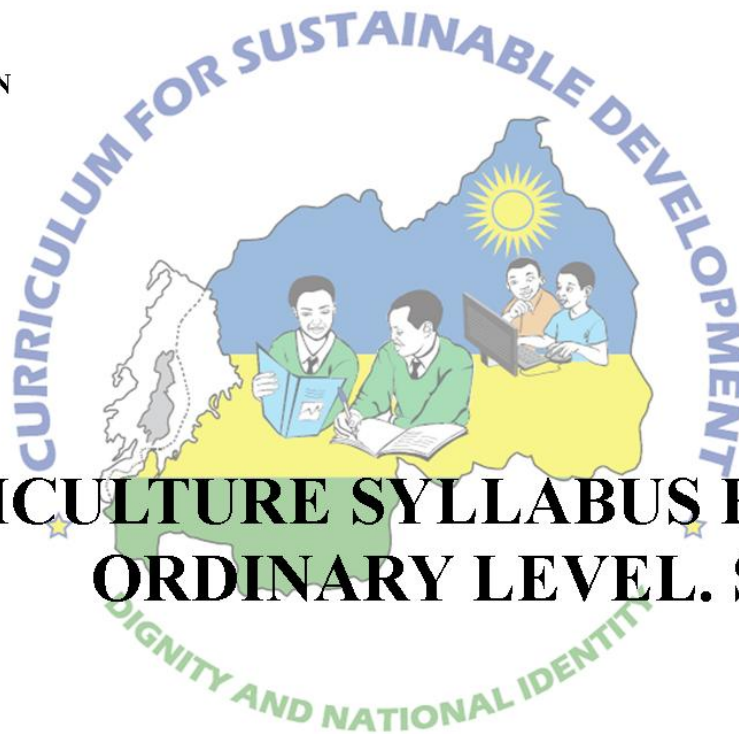


REPUBLIC OF RWANDA



MINISTRY OF EDUCATION



AGRICULTURE SYLLABUS FOR ORDINARY LEVEL. S1-S3

Kigali, 2015

AGRICULTURE SYLLABUS FOR ORDINARY LEVEL, S1-3

Kigali, 2015

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FOREWORD

The Rwanda Education Board is honoured to avail the syllabuses which serve as the official documents and a guide to competence-based teaching and learning, in order to ensure consistency and coherence in the delivery of a quality education across all levels of general education in the Rwandan schools.

The Rwandan education philosophy is to ensure that young people at every level of education achieve their full potential in terms of relevant knowledge, skills and appropriate attitudes that prepare them to be well integrated in the society and exploit employment opportunities.

In line with efforts to improve the quality of education, the government of Rwanda emphasises the importance of aligning the syllabus, teaching and learning and assessment approaches in order to ensure that the system is producing the kind of citizens the country needs. Many factors influence what children are taught, how well they learn and the competencies they acquire, among them the relevance of the syllabus, the quality of teachers' pedagogical approaches, the assessment strategies and the instructional materials available. The ambition to develop a knowledge-based society and the growth of the regional and global competition in the jobs market has necessitated the shift to a competence-based syllabus. With the help of the teachers, whose role is central to the success of the syllabus, the learners will gain appropriate skills and be able to apply what they have learned in the real life situations. Hence they will make a difference not only to their own lives but also to the success of the nation.

I wish to sincerely extend my appreciation to the people who contributed towards the development of this document, particularly REB and its staff, who organised the whole process from its inception. Special appreciation goes to the development partners who supported the exercise throughout.

Any comment and contribution would be welcome for the improvement of this curriculum.

GASANA I . Janvier

Director General REB

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I owe gratitude to different education partners such as UNICEF, UNFPA, DFID and Access to Finance Rwanda for their financial and technical support. We also value the contribution of other education partner organisations such as CNLG, AEGIS Trust, Itorero ry'Igihugu, Gender Monitoring Office, National Unit and Reconciliation Commission, RBS, REMA, Handicap International, Wellspring Foundation, Right to Play, MEDISAR, EDC/L3, EDC/Akazi Kanoze, Save the Children, Faith Based Organisations, WDA, MINECOFIN and local and international consultants. Their respective initiative, co-operation and support were basically responsible for the successful production of this syllabus by Curriculum and Pedagogical Material Production Department (CPMD).

Dr. Joyce MUSABE

Head of CPMD

THE LIST OF PARTICIPANTS WHO WERE INVOLVED IN THE ELABORATION OF THE SYLLABUS:

Rwanda Education Board

Dr. MUSABE Joyce, Head of CPMD, as a Facilitator

RUTAKAMIZE Joseph, Director of Science unit,

HABARUREMA Aaron, Agriculture curriculum specialist.

NYIRANDAGIJIMANA Anathalie, Pedagogical Norms Specialist

Workforce Development Authority (WDA) staff

NDAHIRO André, quality assurance officer in charge of Technical Secondary Schools and A1 Programs

Lecturer and Teachers' Agriculture subject:

NYIRARUKUNDO Séraphine, EAV Kinazi,

NTIVUGURUZZA Fulgence, EAV Ntendezi,

HITAYEZU Alexandre, INES- RUHENGERI.

Quality Assurer:

Martin Richard BRAUND

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1. INTRODUCTION

Rwanda has decided to change the education system, where the knowledge based learning is changed to Competence based learning. In this regard, the Ministry of Education undertook the 2012 syllabus reform in which different changes were made. Competence based learning approach allows the learners to advance, based on their ability to master a skill or a Competence at their own pace regardless of the environment. This method is tailored to meet the different learning abilities and can lead to more efficient learner outcomes. It refers to the systems of instruction, assessment and grading reporting that are based on the learners demonstrating that they have acquired the knowledge and skills they are expected to learn as they progress through their education.

1.1. Background to curriculum review

The rationale behind the agriculture syllabus review process was to ensure that the syllabus is responsive to the needs of the learners and to shift from the objective and knowledge based learning to Competence based learning. This syllabus emphasises more on skills and competencies, and streamlining the coherence within the existing content, by benchmarking with the syllabi elsewhere with the best practices. The new agriculture syllabus guides the interactions between the teacher and the learners in the learning process and highlights the essential practical skills and competencies a learner should acquire during and at the end of each unit of learning.

1.2. Rationale of teaching and learning of Agriculture

1.2.1. Agriculture and society

Agriculture as both, an applied science and an art, is the pillar of our country's economy. It is a composite of rural and urban industries that are structured to produce both raw and value added materials from plants and animals to meet the identified consumer needs. It provides food, fibre, fuel, shelter and other possibilities of diverse lifestyles.

Agricultural industries make a significant contribution to the Rwandan's economy through investment, employment of skilled workers, consumption of the products from other sectors of the economy and export.

Increasing the knowledge and skills in most of the Rwandans, is therefore, to go past integration of agriculture course in Basic Education/Ordinary level. It will help the learners to have a Competence that will help them to develop/view agriculture as a pillar of self-reliance and source of income. Regarding insufficient arable land, agriculture course is important to resort to modern agricultural techniques in order to reach in food production and generate Rwandan's export income.

1.2.2. Agriculture and the learners

Agriculture is a worthwhile subject because it prepares the learners to the real world of work through career pathways like crop production, crop protection, veterinary medicine, rural development, food sciences, rural engineering, agribusiness, agriculture mechanisation. It provides the skills that guide the learners to help her/him to explain all the techniques of crop production and animal rearing, both agricultural and animal products processing and preservation.

This course provides the learners with an understanding of the relationship between production, processing and consumption, to enable them to participate in discussions and to solve problems facing our society. Thus, the government of Rwanda has encouraged the market oriented agriculture through policies like crop intensification and land use consolidation, one cow for one family, increase the productivity of agriculture as one of four priorities of rural development in EDPRSII, Productive High Value and Market Oriented Agriculture in vision 2020, etc. To achieve these policies, all sectors are involved including the learners who have learnt the agriculture course.

1.2.3 Competencies

Competencies are statements of the characteristics that students should demonstrate which indicate they are prepared and have the ability to perform independently in professional practice.

Basic competencies are addressed in the stated broad subject competences, in the objectives highlighted year on year basis and in each of the units of learning. The generic competencies, basic competences that must be emphasised and reflected in the learning process are briefly described below and the teachers will ensure that the learners are exposed to tasks that help the learners acquire the skills.

Generic competencies:

- **Critical and problem solving skills:** The acquisition of such skills will help the learners to think imaginatively, innovatively and broadly to evaluate and find solutions to the problems encountered in our surrounding.
- **Creativity and innovation:** The acquisition of such skills will help the learners to take initiatives and use imagination beyond knowledge provided in the classroom to generate new ideas and construct new concepts.
- **Research:** This will help the learners to find answers to the questions based on the existing information and concepts and use it to explain the phenomena from the gathered information.
- **Communication in official languages:** Teachers, irrespective of being language teachers, will ensure the proper use of the language of instruction by the learners. The teachers should communicate clearly and confidently, and convey ideas effectively through spoken and written, by applying the appropriate language and relevant vocabulary.

- **Cooperation, inter personal management and life skills:** This will help the learner to cooperate as a team in whatever task assigned and to practice positive ethical moral values while respecting the rights, feelings and views of the others. Perform practical activities related to environmental conservation and protection. Advocate for personal, family and community health, hygiene and nutrition and respond creatively to a variety of challenges encountered in life.
- **Lifelong learning:** The acquisition of such skills will help the learners to update their knowledge and skills with minimum external support. The learners will be able to cope with evolution of knowledge advances for personal fulfilment in areas that are relevant to their improvement and development.

Broad competences for the Agriculture subject

At the end of a Senior Three, the learner should be able to:

- Demonstrate basic knowledge, skills and attitudes that accurately lead him to modern farming practice.
- Show the importance of using the good soil with all necessary nutrients and knowing its composition and properties.
- Demonstrate the ability to cultivate a variety of crops, both subsistence and cash crops.
- Rear and treat domestic animals.
- Comprehend and apply the processes involved from the planting to the harvesting of the crops.
- Acquire necessary knowledge and skills in processing, preserving and adding value to the agricultural products.
- Appreciate the economic, social and environmental implications of agriculture.

Agriculture and development of competencies

The national policy documents based on national aspirations, identify some 'basic competencies' alongside the generic competencies that will develop higher order thinking skills and which will help subject learning and application of what has been learnt in the real life situation.

Through practices, observation and presentation of information during the learning process, the learners develop not only deductive and inductive skills but also communication and cooperation skills when working in group; task management skills by accomplishing them at a set time and correctly and, critical thinking skills while observing demonstrations and doing practices (during field trip, field work and group discussion), in trying to make inferences and conclusions.

And then, the group work and cooperative learning of agriculture promotes interpersonal relations and teamwork.

2. PEDAGOGICAL APPROACH

The teacher/trainer is required to mainly orient the course delivery in a practical manner. In this line, he/she will set the learners' hands on activities, organises work groups, experiments and adapts practical activities to climatic constraints. In addition, the teacher will organise field visits as recommended in this curriculum.

In groups, the learners apply the agricultural concepts through learning activities. The observation during the field visits increases an understanding of theoretical course and the most hands on activities are performed in the school's garden. This will help the learner to learn more practical as an aim of Competence based learning.

2.1 Role of the learners

This approach of learning encourages the learners to construct the knowledge, skills and attitudes either individually or in groups in an active way.

The learners work on one Competence at a time in the form of concrete units with specific learning outcomes, broken down into knowledge, skills and attitude.

In practical lessons, the learners will work in groups where the availability of the apparatus will not permit working individually, but they will be encouraged to do simple practices like plot model individually.

2.2 Role of the Teacher/facilitator

The change to a Competence based learning curriculum is about transforming learning, ensuring that learning is deep, enjoyable and habit forming.

The teacher is no longer an instructor but a facilitator in this new approach of learning. The application of the learners, during this new approach, facilitates the teachers to evaluate the learners' individual needs and expectations.

The teacher identifies the needs of the learners, the nature of learning to be done, and the means to shape learning experiences accordingly.

The teachers' roles are to organise and coach the learners in the classroom or outside, and engage them through participatory and interactive methods.

The teacher must select and develop appropriate materials like plot model for the learners to use in their work.

In practical lessons, the teacher shows the procedure to be followed for dangerous practices that may harm the bodies of the learners or assists them through learning by mistakes for no dangerous practices and thereafter give them his/her expertise.

2.3 Special needs education and inclusive approach

All Rwandans have the right to access education regardless of their different needs. The underpinnings of this provision would naturally hold that all citizens benefit from the same menu of educational programs. The possibility of this assumption is the focus of special needs education. The critical issue is that we have persons/ learners who are totally different in their ways of living and learning as opposed to the majority. The difference can either be emotional, physical, sensory and intellectual learning challenged traditionally known as mental retardation.

These learners equally have the right to benefit from the free and compulsory basic education in the nearby ordinary/mainstream schools. Therefore, the schools' role is to enrol them and also set strategies to provide relevant education to them. The teacher therefore is requested to consider each learner's needs during teaching and learning process. Assessment strategies and conditions should also be standardised to the needs of these learners. Detailed guidance for each category of learners with special education needs is provided for in the guidance for teachers.

3. ASSESSMENT APPROACH

Assessment is the process of evaluating the teaching and learning processes through collecting and interpreting evidence of individual learner's progress in learning, and to make a judgment about a learner's achievements measured against the defined standards. Assessment is an integral part of the teaching learning processes. In the new competence based curriculum, assessment must also be competence based whereby a learner is given a complex situation related to his/her everyday life and asked to try to overcome the situation by applying what he/she has learned.

Assessment will be organised at the following levels: School-based assessment, District examinations, National assessment (LARS) and National examinations.

3.1.Types of assessment

3.1.1 Formative and continuous assessment (assessment for learning)

Continuous assessment involves formal and informal methods used by the schools to check whether the learning is taking place. When a teacher is planning a lesson, he/she should establish criteria for the performance and behaviour changes at the beginning of a unit. Then, at the end of every unit, the teacher should ensure that all the learners have mastered the stated key unit competencies based on the criteria stated, before going to the next unit. The teacher will assess how well each learner masters both, the subject and the generic competencies, described in the syllabus and from this, the teacher will gain a picture of the all-round progress of the learner. The teacher will use one or a combination of the following: (a) observation (b) pen and paper (c) oral questioning.

3.1.2 Summative assessment (assessment of learning)

When an assessment is used to record a judgment of a competence or performance of the learner, it serves a summative purpose. Summative assessment, gives a picture of a learner's competence or progress at any specific moment. The main purpose of the summative assessment is to evaluate whether learning objectives have been achieved, and to use the results for the ranking or grading of the learners, for deciding on the progression, for selection into the next level of education and for certification. This assessment should have an integrative aspect, whereby a student must be able to show mastery on all competencies.

It can be an internal school based assessment or external assessment in the form of national examinations. School based summative assessment should take place once at the end of each term and once at the end of the year. School summative assessment average scores

for agriculture subject will be weighted and included in the final national examination's grade. School based assessment average grade will contribute a certain percentage, as the teachers gain more experience and confidence in assessment techniques and in the third year of the implementation of the new curriculum, it will contribute 10% of the final grade, which will progressively increase. Districts will be supported to continue their initiative to organise a common test per class for all the schools, to evaluate the performance and the achievement level of the learners in individual schools. External summative assessment will be done at the end of S3.

3.2. Record Keeping

This is gathering facts and evidences from the assessment instruments, and using them to judge the learner's performance by assigning an indicator against the set criteria or standard. Whatever assessment procedures used, shall generate data in the form of scores, which will be carefully recorded and stored in a portfolio. This will contribute for remedial actions, for alternative instructional strategy and feed back to the learner and to the parents to check the learning progress and to advice accordingly or to the final assessment of the students.

This portfolio is a folder (or binder or even a digital collection) containing the learner's work as well as the learner's evaluation of the strengths and weaknesses of his/her work. Portfolios reflect not only the work produced (such as papers and assignments), but also, it is a record of the activities undertaken over the time as a part of student learning. The portfolio output (formative assessment) will be considered only for a maximum of three years of Advanced level. Besides, it will serve as a verification tool for each learner that, he/she attended the whole learning, before he/she undergoes the summative assessment for the subject. The results from the portfolio will contribute 50% of summative assessment of each year.

3.3. Item writing in summative assessment

Before developing a question paper, a plan or specification of what is to be tested or examined must be elaborated to show the units or topics to be tested on, the number of questions in each level of Bloom's taxonomy and the marks allocation for each question. In a Competence based curriculum, questions from the higher levels of Bloom's taxonomy should be given more weight than those from the knowledge and comprehension level.

Before developing a question paper, the item writer must ensure that the test or examination questions are tailored towards Competence based assessment by doing the following:

- Identify the topic areas to be tested on from the subject syllabus.
- Outline the subject matter content to be considered as the basis for the test.
- Identify the learning outcomes to be measured by the test.
- Prepare a table of specifications.
- Ensure that the verbs used in the formulation of questions do not require memorisation or recall answers only, but testing broad competencies as stated in the syllabus.

Structure and format of the examination

There will be 3 papers in Agriculture subject to be examined. Time allocated for all papers will depend on their respective weight.

NB: In case of learners with special education needs, the time allocated for each paper will depend on their needs.

The papers will be structured as follows:

- Paper 1 will be based on the practices of crop production techniques (40%).
- Paper 2 will be based on the practices of animal production techniques (30%).

- Paper 3 will be based on knowledge and understanding of the crop and animal products preservation and processing, and the principles of agriculture economics (30%).

3.4. Reporting to Parents

The wider range of learning in the new curriculum means that it is necessary to think again about how to share learners' progress with parents. A single mark is not sufficient to convey the different expectations of learning which are in the learning objectives. The most helpful reporting is to share what students are doing well and where they need to improve.

4. RESOURCES

4.1 List of materials/equipment needed

In this level, the following materials/equipment is needed to facilitate the implementation of the Competence based learning in the agriculture course.. Detailed list of didactic materials is found at the footer of each unit writing. Here, different sources, categories and types of didactic materials are mentioned. Indeed didactic materials can originate from the improvisation by the teacher, in a close or remote school environment. As far as its nature is concerned, didactic materials can be video or audio- visual, ICT, physical living or non-living materials.

4.2. Human resources

The effective implementation of this syllabus needs a joint collaboration of educators at all levels. Given the material requirements, teachers are expected to accomplish their noble role as stated above. However teachers should be equipped with a strong pedagogical

content knowledge (PCK) and enough teaching experience. Furthermore, an agriculture teacher should be creative and able to improvise since many of teaching aids can be found around the school.

On the other hand school head teachers and directors of studies should be trained on the use of Competence-based syllabus then, they will be able to make a follow-up and assess the teaching and learning of this subject due to their profiles in the schools. These combined efforts will ensure bright future careers and lives for learners as well as the contemporary development of the country.

Skills required for the teacher of this subject:

- Engage students in variety of learning activities
- Use multiple teaching and assessment methods
- Adjust instructions to the level of the learner
- Creativity and innovation
- Makes connections/relations with other subjects
- Should have high level of knowledge of the content
- Effective discipline skills
- Good classroom management skills
- Good communicator
- Guide and counselor
- Passion for children teaching and learning

5. SYLLABUS UNITS

5.1. Presentation of the structure of the syllabus units

Agriculture subject is taught and learned in the lower secondary education as an elective subject. At every grade, the syllabus is structured in Topic Areas, and then further broken down into Units. The units have the following elements:

- a. Unit is aligned with the Number of Lessons.
- b. Each Unit has a Key Unit Competence, whose achievement is pursued by all teaching and learning activities undertaken by, both the teacher and the learners.
- c. Each Unit Key Competence is broken into three types of Learning Objectives as follows:
 - i. **Type I:** Learning Objectives related to Knowledge and Understanding (also known as Lower Order Thinking Skills or LOTS)
 - ii. **Type II and Type III:** These Learning Objectives relate to the acquisition of Skills, Attitudes and Values (also known as Higher Order Thinking Skills or HOTS). These Learning Objectives are actually considered to be the ones targeted by the present reviewed syllabus.
- d. Each Unit has a Content which indicates the scope of coverage of what a teacher should teach and the learner should learn in line with stated learning objectives.
- e. Each Unit suggests Learning Activities that are expected to engage the learners in an interactive learning process as much as possible (learner-centred and participatory approach).

- f. Finally, each Unit is linked to Other Subjects, its Assessment Criteria and the Materials (or resources) that are expected to be used in the teaching and learning process.

In all, the syllabus of Agriculture for O' level has got 4 Topic Areas (Soil Science, Crop production and processing, Animal production, Agriculture economics). As for units, there are 7 in S1, 7 in S2 and 8 in S3.

5.2. Agriculture S1

5.2.1 Key Competences at the end of Senior one

Learners should be able to:

- Interpret differences between types of soils, explain importance and branches of agriculture and discover farming systems.
- Conduct cultivation of different types of vegetables and fruits from nursery up to harvesting and their conservation using adequately appropriate farm tools.
- Differentiate non ruminant species, breeds, and livestock products and conduct successfully rabbit rearing, and explain basic principles of farm economics.

5.2.2 Table units for Senior One

Topic Area: Soil Science				
Agriculture S1		Unit 1: Introduction to Agriculture		No. of lessons: 6
Key unit Competence: The learner should be able to explain correctly the importance of agriculture in human life and its branches, and identify different farming systems.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - Define agriculture. - Identify socio-economic importance of agriculture. - State the branches of agriculture. - Define farming systems. - Describe the types of farming systems. - State advantages and disadvantages of 	<ul style="list-style-type: none"> - Recognise the definition of agriculture. - Perceive the importance of agriculture. - Recognise the branches of agriculture. - Recognise farming systems. - Recognise the advantages and disadvantages of farming 	<ul style="list-style-type: none"> - Agree to a definition of agriculture. - Appreciate the importance of agriculture. - Show positive attitudes to observe and interact with colleagues. - Participate willingly in discussion on the branches of agriculture. - Pay attention while observing, to deduce the definition and types of farming systems. - Pay attention and contribute actively while 	<ul style="list-style-type: none"> - Definition of agriculture. - Importance of agriculture (food supply, source of employment, source of raw materials for industries, source of capital, source of medicinal products, foreign exchange earner, treated as recreation, provision of materials for industrial goods). - Branches of agriculture (Soil science, Crop husbandry, Animal husbandry, Agricultural economics, Agricultural engineering, Horticulture). - Farming systems: <ul style="list-style-type: none"> o Definition of farming systems. o Types of farming systems 	<ul style="list-style-type: none"> - Research in internet /library, the definition of agriculture. - Trip to a farm during the harvesting period or to crop processing industries to discuss the importance of agriculture. - Field visit to discuss on the branches of agriculture. - Field visit to observe and interact in groups to define and identify the types of farming systems through comparison between them. - Trip to a farm to observe the farming systems and

farming systems.	systems.	finding the importance of farming systems. - Appreciate the advantages of farming systems.	(mono-cropping and intercropping, pastoralism, stall-feeding system etc.). ○ Advantages and disadvantages of farming systems.	discuss on their importance in agriculture production.
Links to other subjects: Home Science and Economics.				
Assessment criteria: The learners can explain the importance of agriculture in human life like good health and increasing of home income, to identify farming systems referring to their composition (number of crops grown in each system and the kind of product targeted).				
Materials: Modern library, computer in laboratory with internet, projector, field production plots.				

Topic Area: Soil Science

Agriculture S1		Unit 2: Soil	No. of lessons : 10	
Key unit Competence: The learner should be able to interpret the soil formation, properties and types of soil.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> -Define soil. -Understand the soil formation. -Indicate types of soil. -Identify clay, loam and sandy soils by their properties. -Illustrate the components of the soil. 	<ul style="list-style-type: none"> - Justify the meaning and formation of soil. - Discriminate types of soil. - Differentiate clay, loam and sandy soils by observation and touch. - Master components of soil. - View layers of soil. - Conduct physical soil properties through 	<ul style="list-style-type: none"> -Show interest in the nature of soil, recognise both, its usefulness and importance. -Show concern/curiosity towards soil formation. -Appreciate the types of soil by touching. -Show resilience in determining the types of soil by observation (manipulate without disdaining soil samples). -Agree on the components of soil 	<ul style="list-style-type: none"> -Soil definition. -The process of soil formation: <ul style="list-style-type: none"> o Physical weathering: agents of physical weathering (wind, running water, ice, temperature change, plant roots, human and animal activities). o Chemical weathering: carbonation, oxidation, hydration, dissolution, hydrolysis. o Transport and deposition (accumulation) of weathered material. o Invasion of the accumulated material by living organisms which provide organic matter. -Soil types (sandy, loamy and clay). -Properties of clay soil (small particles, small air space, poor aeration, poor water drainage, good capillarity); loam and sandy soil (large particles, large air space, poor water retention, good 	<ul style="list-style-type: none"> - Research in internet, the definition of soil and soil formation process. - Watch video from internet on the process of soil formation. - Field visit to observe, discuss and distinguish loam, sandy and clay soil by touching. - Field trip with guided group discussion and interaction on the soil layers and components of soil. - Field trip to observe and agree on the different layers of soil. - Conduct experiment illustrating properties of

<ul style="list-style-type: none"> -Identify the layers of soil. -Explain soil properties. -Carry out the soil sampling and soil pH determination. 	<p>experience at the workplace.</p> <ul style="list-style-type: none"> - Practice soil sampling and soil pH determination 	<p>with the group members.</p> <ul style="list-style-type: none"> -Be curious to perceive soil layers. -Perspectives of soil properties. -Be attentive and effective while sampling to determine soil pH. 	<p>aeration).</p> <ul style="list-style-type: none"> -Soil composition (rock particles, water, air, humus/organic material, mineral salt, lime). -Soil profile/soil layers (top soil, sub soil, weathered, rock layer). -Soil properties: physical soil properties (texture, soil structure, water holding capacity/porosity, soil compaction); chemical soil properties (pH/ acidity and alkalinity, salinity (EC), Cation exchange capacity (CEC), organic matter, C:Nratio (Carbon to Nitrogen)and biological properties. -Soil sampling (simple tests for water and organic matter and pH, using a paper indicator). 	<p>soil using different perforated plastic sleeves/tubes/pots containing different types of soil in which the water will be added to test water holding capacity, soil texture, and soil compaction.</p> <ul style="list-style-type: none"> - Practical work in the field and workshop to sample and determine soil nature (pH using a paper indicator).
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Links to other subjects: Chemistry.

Assessment criteria: *The learners can identify the types of soil by touching them; can illustrate the components of soil by the observation of rock particles, water, humus, lime; can interpret soil properties by reading the paper indicator used in determination of pH and differentiating soil layers; can interpret the links between the speed of water in perforated tubes/pots with the soil texture.*

Materials: *Soil samples, field, library, computer room with internet connection, paper indicator, soil auger, a plot for soil sampling.*

Topic area: Crop and mushroom production and processing

Agriculture S1		Unit 3: A farm		No. of lessons: 9	
Key unit Competence: The learner should be able to classify farm tools and be able to use small tools safely.					
Learning objectives			Content	Learning Activities	
Knowledge and Understanding	Skills	Attitudes and Values			
<ul style="list-style-type: none"> - Identify small farm tools. - Categorise small farm tools. - Explain the effective use and maintenance of the range of small farm tools. - Identify the small farm tools needed to be maintained 	<ul style="list-style-type: none"> - Select small farm tools used. - Organize small farm tools and equipment according to their use. - Manipulate small farm tools effectively. - Maintain small farm tools effectively. 	<ul style="list-style-type: none"> - Be attentive in observing the small farm tools. - Show positive attitude towards one's colleagues during the discussions - Be careful and avoid risks to yourself and others while manipulating small farm tools. - Show respect/care for the small farm tools to maintain them in good conditions. 	<ul style="list-style-type: none"> - Identification of small farm tools (flail, hosepipe, scythe, secateurs, trimmer, trowel shears, hand hoe, forked hoe, spade, shovel, rake, manure fork, hay fork, wheelbarrow, watering can, pick axe, mattock, pangas/ machette, slasher, billhook, sickle, grafting knife, rake maker, sprayer, diary pot, lactodensimeter, churn etc.). - Classification of small farm tools : gardening tools and farming tools. - Safe and effective use of small farm tools. - Effective maintenance of small farm tools 	<ul style="list-style-type: none"> - Field trip in a multipurpose farm to observe the tools used in a maximum operations executed in different farming activities, find out their names, types, and classes after the group discussion - Watch demonstrations/ videos of small farm tools being used and maintained, to observe and understand their use and maintenance - Practical experience of using tools in the school garden, group discussion on the effective use and maintenance and make presentations on the best practice. 	
Links to other subjects: SET/ agriculture tools.					
Assessment criteria: The learners can classify the farm tools according to their use; can manipulate safely the small farm tools without injuring oneself.					
Materials: Garden and farming tools, computer, projector.					
Topic Area: Crop and mushroom production and processing					

Agriculture S1	Unit 4: Vegetables			No of lessons :22
Key Unit competence: The learner should be able to cultivate and then preserve vegetables				
Learning objectives			Content	Learning Activities
Knowledge and understanding	Skills	Attitudes and values		
<ul style="list-style-type: none"> - Give examples of vegetables - Explain the importance of vegetables - State vegetables classes 	<ul style="list-style-type: none"> - Perceive vegetables found in the region. - Categorise vegetables according to their importance. - See and classify vegetables. 	<ul style="list-style-type: none"> - Have a team spirit in exploring the vegetables definition. - Appreciate the importance of vegetables in human life. - Positive attitudes towards others while classifying vegetables. 	<ul style="list-style-type: none"> - Vegetables definition. - Importance of vegetables. - Criteria based on the classification of vegetable crops : <ul style="list-style-type: none"> ○ Based on the edible parts (leaf vegetables, fruit vegetables, root vegetables, bulb vegetables). ○ Botanical classification (Brassicaceae, amaranthaceae, solanaceae, cucurbitaceae). ○ Hardness (hard, semi hard, tender). 	<ul style="list-style-type: none"> - Field visit to explore all kind of vegetables found in the surrounding or cultivated in modern plot of the school fields; to discuss in groups and classify the vegetables according to the criteria of classification.

<ul style="list-style-type: none"> - Recall the nursery - Describe the type of nursery - State selection criteria for a nursery - Explain how to prepare a nursery - Discuss on how to sow vegetables - Describe nursery activities 	<ul style="list-style-type: none"> - Recognise the definition of a nursery. - Perceive the types of nursery. - Select nursery site. - Perform nursery preparation. - Demonstrate sowing of common vegetables seeds. - Execute nursery practices. 	<ul style="list-style-type: none"> - Exhibit loyalty of the nursery. - Perspective of a nursery on the vegetables. - Risk taken while preparing a nursery. - Justify the behaviour of being active during work. - Initiate and assume the responsibilities to carry out nursery care 	<ul style="list-style-type: none"> - Nursery establishment: <ul style="list-style-type: none"> o Definition of nursery o Types of nursery (temporary, permanent) o Selection criteria of a nursery site (climate, soil, water, topography, previous land use, site production, potential, proximity to the customers, land availability and the cost). o Nursery preparation for vegetables. o Sowing methods of common vegetables. o Caring of seedlings in the nursery bed (hardening off, thinning, watering, harrowing, earthing up, pest and diseases control). 	<ul style="list-style-type: none"> o Field visit of school nursery (if available) to explore site, seedlings and its construction way. o Field work to prepare and construct a nursery. o Practice sowing by groups of students. o Field work by group of learners for seedlings in a nursery care.
<ul style="list-style-type: none"> - Carry out soil preparation steps - Explain the methods of vegetables transplanting 	<ul style="list-style-type: none"> - Practice the preparation of soil for vegetable transplanting. - Transplant common vegetables seedlings. 	<ul style="list-style-type: none"> - Show concern while preparing soil for seedlings transplantation. - Take care while transplanting vegetables for non - damaged vegetable seedlings. 	<ul style="list-style-type: none"> - Land preparation (clearing, 1st and 2nd ploughing, levelling). - Planting methods of vegetables (direct planting and indirect planting/ transplanting). 	<ul style="list-style-type: none"> - Practice in school field to prepare soil for planting vegetable seedlings. - Field work to transplant vegetable seedlings in groups.

<ul style="list-style-type: none"> - Carry out maintenance activities of vegetables - Describe vegetables ready to be harvested - Identify methods of vegetables' preservation 	<ul style="list-style-type: none"> - Perform common maintenance activities of vegetables. - Perceive signs of maturity of vegetables. - Adapt real vegetable or pictures of vegetable to require the method of preservation 	<ul style="list-style-type: none"> - Show concern while doing maintenance activities of the common vegetables. - Agree to the signs of maturity of vegetables. - Choose freely the right corner to preserve vegetables. 	<ul style="list-style-type: none"> - Maintenance activities of the vegetables (weeding, thinning, gapping, watering, mulching, spraying). - Harvesting indicators of vegetables (days to mature, size, colour). - Preservation methods of vegetables (freezing, tinning, pickling, fermentation, fourth generation vegetables = preservation in vacuum plastic bags, canning). 	<ul style="list-style-type: none"> - Field work in the school garden to carry out the maintenance activities of the vegetables by demonstration. - Trip on the garden to observe and discuss in groups on the signs of maturity for the different grown vegetables. - Activity of cooperative learning (different corners that are equal to the number of preservation methods; by use of rare vegetables or their pictures) to identify the way of preserving them.
<p>Links to other subjects : STE(plant,), Biology (Classification of new organisms) , Mathematic (geometry)</p>				
<p>Assessment criteria: The learners can classify vegetables according to the edible parts, botany and hardness; can conduct maintenance, harvesting and preservation of vegetables due to good health of vegetables grown and the maturity; can establish a nursery referring to the selection criteria of site; can transplant vegetable seedlings according of the soil fines, levelling and establishment of seedlings in a final plot.</p>				
<p>Materials: Computer lab, library, samples of vegetables, vegetables seeds, woods, school field, hoes, pangas, rakes, mulches, watering can</p>				

Topic Area: Animal production				
Agriculture S1		Unit 5: Animals		No. of lessons: 10
Key unit Competence: The learner should be able to identify non-ruminant species and breeds and conduct successfully rabbit rearing.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - Definition of non-ruminant. - Give examples of non-ruminant species and breeds. - Describe differences between non-ruminant species and breeds. - Explain the characteristics of non-ruminant breeds. 	<ul style="list-style-type: none"> - Recognise non-ruminants. - Distinguish non-ruminant species and breeds with comparison to their characteristics. - Detect non-ruminant breeds' characteristics. 	<ul style="list-style-type: none"> - Be curious and cautious in observing the non-ruminant species.. - Active participation in group discussion and interact positively with the colleagues. - Agree to the characteristics of non-ruminant' breeds. 	<ul style="list-style-type: none"> - Definition of non-ruminant. - Non-ruminant species (poultry, pig, rabbit). - Non-ruminant breeds (Poultry: local, Rhode Island red, Derco, Sussex; Rabbit: Angola, California, local, New Zealand; Pig: large white, local, landrace, Pietrain). - Characteristics of non-ruminant breeds. 	<ul style="list-style-type: none"> - Field visit to a non-ruminant farm to observe and extrapolate the differences between non-ruminant species by their characteristics. - Watch videos on different non-ruminant animals to find out the different characteristics of the breeds individually, followed by the group' discussions. - With internet research, the learners, discuss and find out in groups, the characteristics of non-ruminant species and breeds.

<ul style="list-style-type: none"> - Explain the conditions suitable for a rabbit hutch. - State the materials used to construct a hutch. - Carry out the construction of a hutch. 	<ul style="list-style-type: none"> - View standards of a rabbit hutch. - Select and gather materials to construct a hutch. - Construct a hutch. 	<ul style="list-style-type: none"> - Be active in the discussions and be attentive in observing a constructed hutch. - Manipulate carefully a rabbit hutch construction material. - Participate willingly in the construction of a hutch 	<ul style="list-style-type: none"> - Hutch construction: <ul style="list-style-type: none"> ○ Standards of a hutch. ○ Fitting materials to construct a hutch (timber, iron sheet, nails, iron nets). ○ Rabbit hutch construction. 	<ul style="list-style-type: none"> - Field visit on a rabbit farm to observe a hutch, the materials it is made of. and how they are arranged. Discuss in groups and use standards and different operations to be carried out in constructing a hutch. - Field work to construct a standardised hutch, according to the sex and development stage of a rabbit.
<ul style="list-style-type: none"> - List the ingredients of an appropriate diet for a rabbit. - State the different possible diets for a rabbit as per its growth, age and body weight. - Describe a feeding plan for a rabbit. 	<ul style="list-style-type: none"> - Select appropriate ingredients for a rabbit diet. - Propose an appropriate diet for a rabbit. - Practice rabbit feeding/implement a rabbit feeding plan. 	<ul style="list-style-type: none"> - Be attentive in observing the food distribution operation. - Be careful and cautious in distributing food. 	<ul style="list-style-type: none"> - Food (diets: tubers, grasses, concentrates, water) for a rabbit. - Rabbit feeding (quantify concentrates) due to body weight and type of food due to age. 	<ul style="list-style-type: none"> - Field trip to rabbit farm to find about the distributed food with a given frequency and in group discussion extrapolate different ingredients of a rabbit's diet and come up with a feeding plan as implemented in the farm considering the rabbit's body weight and age.
<ul style="list-style-type: none"> - Identify the name and describe the rabbit's common diseases and enemies. 	<ul style="list-style-type: none"> - Recognise rabbit's diseases, visible symptoms in a farm or on the 	<ul style="list-style-type: none"> - Have positive attitude when interacting with the colleagues. - Be attentive in 	<ul style="list-style-type: none"> - Rabbit diseases and enemies: Coccidiosis, Myxomatosis, pasteurelosis, diarrhea, bloat, constipation, ants, mice. 	<ul style="list-style-type: none"> - Field visit on a rabbit farm. - Infested and affected by different rabbit diseases, observe their characteristics (symptoms and damages) in the group discussion. The teacher's facilitation

<ul style="list-style-type: none"> - Describe control methods in a rabbit farm. 	<ul style="list-style-type: none"> videos. - Find out the characteristics of the diseases and enemies. - Practice rules for a rabbit farm sanitation. 	<ul style="list-style-type: none"> observing sick rabbits and sanitarian state of the farm. - Be attentive and cautious in implementing prophylactic plan in a rabbit farm. 	<ul style="list-style-type: none"> - Causes, symptoms, damages, prevention and curative control methods). - Farm sanitation. 	<ul style="list-style-type: none"> helps the learners to find out the rabbit diseases and enemies. Or - Watching videos or charts of different rabbit diseases, observe and list the characteristics (symptoms and signs) of each disease individually, and thereafter discuss in groups on the found characteristics.
<p>Links to other subjects: <i>Mathematics (geometry), Home Science (nutrition), Biology (genetics and classification of animal organisms, health and diseases).</i></p>				
<p>Assessment criteria: <i>The learners can identify the non-ruminant species and breeds by their characteristics; can construct a hutch according to the development stage and sex of a rabbit; can conduct rabbit feeding successfully in a rabbit farm considering the rabbit's body weight, age and types of fodder; can find out/ recognise rabbit diseases and enemies in a rabbit farm by referring to their symptoms and damages.</i></p>				
<p>Materials: <i>Non ruminants farms, projector, CD-videos, computer with internet connection, timber, bricks, cement, lattices, nails, carpenter hammer, iron sheets, water, basins; rabbit food (ingredients), farm containing rabbits, rack, watering tool; Rabbit farms, drugs used in disease prevention, materials used in distributing drugs.</i></p>				

Topic Area: Animal production				
Agriculture S1		Unit 6: Livestock products		No. of lessons: 7
Key unit Competence: The learner should be able to differentiate the livestock products and by products.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - State livestock products and by products. - Describe cattle, pig, poultry and rabbit products and by products. 	<ul style="list-style-type: none"> - Recognise cattle, pig, poultry and rabbit products and by products. - Point out the livestock products and by products. 	<ul style="list-style-type: none"> - Be active in group discussion and interact positively with the colleagues. - Be curious and attentive while observing animal products in the slaughterhouses and diaries. 	<ul style="list-style-type: none"> - Cattle products (meat, milk, skin, ice cream, cheese, yogurt) and by products (tallow, gelatine, leather, blood, horns, bones). - Pig products (meat, lard) and by products (suede for shoes and clothing, gelatine for food and non-food uses). - Poultry products (meat, eggs). - Rabbit products (meat, fur for making socks). 	<ul style="list-style-type: none"> - Research in internet or in the school library to find the livestock products and by products through group discussions. - Field visit on the livestock slaughterhouses and diaries and processing industries to observe the process, and identify the final livestock products and by products referring to their physical aspects.
Links to other subjects: Home Science (nutrition).				
Assessment criteria: The learners can recognise livestock products and by products referring to their physical aspects and original species.				
Materials: Physical and online libraries, slaughterhouses and diaries, different livestock products.				

Topic Area: Agriculture economics		Sub-topic area: Principles of farm economics, problems and solutions of agriculture in Rwanda		
Agriculture S1		Unit 7: Principles of farm economics		No. of lessons: 8
Key unit Competence: The learner should be able to explain the main elements of agricultural economics, particularly the influence of demand, supply and diminishing returns on the production and prices.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - State the law of demand and supply. - Illustrate the law of diminishing returns. - Differentiate substitute products, complementary and competitive products. - Identify the items to be recorded. - Differentiate the types of farm budgeting. 	<ul style="list-style-type: none"> - Design the graphs of the law of demand and supply and its indicators. - Design the graphs of the law of diminishing returns. - Draw and interpret the graphs of substitutes, complementary and competitive products. - Collect data to perform farm records. - Set up the budget of small farming enterprise. 	<ul style="list-style-type: none"> - Assume responsibility of either a seller or a buyer. - Behave according to the role played. - Use available commodities as the resource to express the products relationship. - Choose farm items to be recorded. - Initiate the culture of setting up the budgets. 	<ul style="list-style-type: none"> - Theory of demand. - Theory of supply. - Law of diminishing returns. - Product relationship (substitutes, complementary). - Farm records: types of records (expenditures, income, balance sheet, profit, production records). - Farm budgeting. 	<ul style="list-style-type: none"> - Role play between the sellers and buyers with commodities and money, to deduce the law of demand, supply and diminishing returns after the group discussion through reflective observation. - Trip on the market to analyse the products' relationship by comparing the products owing to their nature. - Practical experience on the farm records and farm budgeting.
Links to other subjects: <i>Entrepreneurship/ Managing finances, Business planning; Economics/ Price theory, Geography (human economic geography).</i>				
Assessment criteria: <i>The learners can explain the law of demand, supply and diminishing returns according to the cropping season and consumers; interpret product relationships referring to their nature and perform farm records referring to the different items to be recorded and design budget correctly.</i>				
Materials: <i>Market, farm, commodities, money.</i>				

5.3. Agriculture S2

5.3.1 Key Competences at the end of Senior Two

- Recognise the fertile soil, restore fertility of poor soil,
- Conduct cultivation of mushrooms, fruits, legumes, grasses and apply post-harvest techniques for soybeans and groundnuts using and manipulating correctly the farm tools.
- Differentiate ruminant species, breeds, successfully conduct their rearing, understand conservation of high quality livestock products, and explain principles of farm economics.

5.3.2 Units for Senior Two

Topic Area: Soil Science				
Agriculture S2		Unit 1: Soil		No. of lessons: 10
Key unit Competence: The learner should be able to describe the characteristics of fertile soil, differentiate inorganic fertilisers and make organic fertilisers.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - Define soil fertility. - Describe the characteristics of soil fertility and state the indicative plants of fertile soils. - Distinguish the factors affecting the availability of plant nutrients. - Describe the 	<ul style="list-style-type: none"> - Conduct experiments illustrating soil fertility. - Detect fertile soils with the indicative plants. - Try to understand the problem of insufficient water and propose its solution. - Recognise the factors affecting the availability of plant nutrients. - Recognise some plants with symptoms of mineral nutrient deficiencies. 	<ul style="list-style-type: none"> - Show patience awaiting the agricultural results. - Be careful and attentive while detecting the soil's fertility characteristics. - Assume the responsibility of solving problem. - Be attentive while observing the plants nutrient deficiencies. 	<ul style="list-style-type: none"> - Definition of soil fertility. - Characteristics of fertile soil (dark colour, contain plenty of humus, enough lime to maintain the pH to neutral) and its plant indicators. - Factors affecting the soil fertility (availability of water, water drainage, activity of soil organism). - Factors affecting the availability of plant nutrients (soil pH, organic matter, soil texture, climate, 	<ul style="list-style-type: none"> - Field activity to characterise the fertile soil by observation of colour, touching with hands, estimation of its pH using pH-meter or indicator paper and by observing the plant indicators. - Problem solving: by showing the plants grown in soil with insufficient water, discuss on the problem and find

symptoms of plants deficient in minerals.			leaching from sandy soil, soil compaction, crop removal, use of sensitive crops, nutrient interactions). - Symptoms of mineral nutrient deficiencies.	its solution.
<ul style="list-style-type: none"> - Name the organic fertilisers. - Carry out the steps of making compost. - Apply methods of making farmyard manures. - Identify the different fertilisers used in agriculture. 	<ul style="list-style-type: none"> - Distinguish organic fertilisers. - Perform the steps of making compost. - Perform the steps of making farmyard manures. - Recognise the major inorganic fertilisers used in agriculture. 	<ul style="list-style-type: none"> - Be aware of the types of organic manure. - Conform on compost making. - Conform on making farmyard manures. - Be careful and attentive while observing and manipulating the fertilisers. 	<ul style="list-style-type: none"> - Definition of organic manures. - Types of organic manures (compost, farm yard manure, green manure, night soil). - Types of compost (Heap and Pit composts). - Steps of making compost/pit compost (make a pit for the waste, add the manure, add the soil, repeat the activity until the pit is filled up, cover the pit with the soil , use a long stick to monitor the temperature in the middle of the pile). - Steps of farmyard manure making. - Main inorganic fertilisers (NPK, urea, DAP). 	<ul style="list-style-type: none"> - Field work to follow all the process of making compost and farmyard manure and imitate that process/steps in groups. - Field trip to a shop of inorganic fertilisers to observe and manipulate fertilisers.
Links to other subjects: Geography, Chemistry (group five elements) and Biology (biotechnology).				
Assessment criteria: The learners can characterise fertile soil, depending on colour, humus content, lime content and pH degree; can recognise the fertile soil referring to the plant indicators and symptoms of plants deficient in minerals; can make compost and farm yard manure by respecting the steps involved in that process; can recognise inorganic fertilisers displayed in the market.				
Materials: pH-meter, plot soil, indicator paper, sample of inorganic fertilisers, organic wastes, manure, water, terrain, sticks, soil, ash.				

Topic Area: Crop and mushroom production and processing

Agriculture S2

Unit 2: Mushrooms

No. of lessons: 4

Key unit Competence: The learner should be able to conduct successfully the mushroom tubes preparation and mushroom cultivation.

Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - Define mushroom. - Explain mushroom propagation process. - Classify types of mushrooms.. - Factors affecting the preparation of mushroom tubes. - Factors affecting mushroom cultivation. - Explain mushroom cultivation technique. 	<ul style="list-style-type: none"> - Manufacture mushroom tubes (mushroom substratum making, inoculation of mycelium). - Apply mushroom cultivation technique. 	<ul style="list-style-type: none"> - Observe attentively mycelium and mushroom development. - Show positive attitude in group discussions and take account of the colleagues' point of views. - Respect the protocol of preparing mushroom tubes and mushroom cultivation. 	<ul style="list-style-type: none"> - Definition of mushroom. - Propagation of mushroom. - Types of mushrooms (edible and non-edible mushrooms). - Production of mushroom tubes (compost sterilisation, drying, crushing, packing up/bagging, mycelium sowing). - Mushroom cultivation technique (arranging mushroom tubes in a nursery bed, shading, watering, weeding). 	<ul style="list-style-type: none"> - Research on internet or in the school library and discuss in groups the definition of mushroom, mushroom propagation, types of mushroom, preparation of mushroom tubes and mushroom cultivation. - Field visit to a cooperative or household growing mushrooms or preparing mushroom tubes; observe and find out the mushroom tubes production and cultivation work, deduce factors affecting the preparation of mushroom tubes, mushroom cropping and imitate in the school nursery the preparation of mushroom tubes and also practice mushroom cultivation. - Problem solving: in choosing the type of compost to inoculate with mycelium when preparing mushroom tubes.

Links to other subjects: *Biology (classification of living organisms or biodiversity).*

Assessment criteria: *The learners can conduct mushroom tubes preparation and cultivation.*

Materials: *Mushroom seed making households or cooperatives, mushroom farming households, cooperatives or schools, mushroom tubes, compost, bags, hoe, computer room with internet connection, library.*

Topic Area: Crop and mushroom production and processing				
Agriculture S2		Unit 3: Fruits		No. of lessons: 20
Key unit Competence: The learner should be able to conduct an appropriate propagation method of fruits, management of fruit trees and processing and preservation of fruits.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - Define fruit tree. - Discuss the importance of fruit trees. - Give examples of fruit trees in Rwanda. - Discuss the methods of propagation of fruit trees. - Describe grafting technique on fruit trees. - Carry out the orchard management practices. 	<ul style="list-style-type: none"> - Explore the cultivated fruits and view their importance.. - Recognise the fruits cultivated in Rwanda. - Recognise the propagation method of fruit trees. - Perform grafting of fruit trees. - Maintain efficiently the fruit trees. 	<ul style="list-style-type: none"> - Appraise the importance of fruit trees. - Cooperate with the colleagues while discussing in groups. - Be careful and cautious while doing grafting. - Show concern while doing planting and site selection, pruning, watering, pests and diseases control of the fruits. 	<ul style="list-style-type: none"> - Fruit trees definition. - Importance of fruits. - Some fruits cultivated in Rwanda (avocadoes, papaya, mangoes, tamarillo, citrus, etc.). - Propagation method of fruits (layering, grafting, seed propagation, stem cutting, seeds). - Grafting of avocado and citrus fruit trees. - Orchard management practices (planting and site selection, pruning, watering, pests and diseases control). 	<ul style="list-style-type: none"> - Field visit to explore the cultivated fruits and deduce their definition and importance. - Group discussion to enumerate cultivated fruits in Rwanda. - Research in internet or in the library the different methods of propagation, discuss in groups and make presentation. - Field work in a fruit nursery to observe the demonstration of grafting on avocado and citrus fruits and apply it. - Watch video of pruning of fruit trees and discuss in groups how, why and when to prune fruit tree (e.g. citrus pruning). - Practical work on fruit trees pruning (e.g. citrus) by the learners.
<ul style="list-style-type: none"> - Define fruit processing and preservation. 	<ul style="list-style-type: none"> - Observe processed fruits and taste the 	<ul style="list-style-type: none"> - Be attentive while observing the fruit preservation and 	<ul style="list-style-type: none"> - Definition of processing and preservation of fruits. - Importance of processing and 	<ul style="list-style-type: none"> - Trip in the areas where fruits are processed and preserved, discuss their

<ul style="list-style-type: none"> - Discuss the importance of fruit processing. - Explain the aims of post-harvest technologies. - Discuss the preservation techniques of fruits. - Discuss the fruits that may be processed. - Describe steps involved in processing of the fruits. 	<p>preserved ones.</p> <ul style="list-style-type: none"> - Recognise the aims of post-harvest technologies. - Perform the fruit preservation techniques. - Perceive some fruits which require processing. - Observe and differentiate the steps involved in fruit processing up to the final product. 	<p>processing.</p> <ul style="list-style-type: none"> - Be aware of the importance of fruit preservation. - Participate willingly in discussion on the aims of post-harvest technologies. - Show concern while choosing the preservation techniques in fruits. - Contribute in discussion, on the fruits to be processed. - Pay attention while observing and describe the steps involved in fruit processing. 	<p>preservation of fruits.</p> <ul style="list-style-type: none"> - Objectives of applying post-harvest technologies (maintain quality= flavour, appearance, texture and nutritive value; to protect food safety, introduce losses, both physical and in market value). - Preservation techniques of fruits (refrigeration, freezing, sweetening, canning, curing, fermentation). - Some fruits to be processed (strawberries, passion fruit, papaya, pineapple, citrus, tamarillo). - Products processed from fruits (jam, juice, marmalade) and the steps involved in their processing. 	<p>definition and their importance after observing and tasting the processed fruits.</p> <ul style="list-style-type: none"> - After group discussion, research in internet to find out the importance of applying post-harvest technologies. - Research in internet or the school library to find out the different fruit preservation technologies and apply them in groups to the fruits availed by the teacher. - Trip to an orchard to observe and discuss on the fruit that may be processed.
<p>Links to other subjects: <i>Biology (plant asexual reproduction), Home science (nutrients) and Chemistry (organic chemistry).</i></p>				
<p>Assessment criteria: <i>The learners can conduct a propagation of fruit tree by respecting all the steps of grafting; can conduct a management activities of orchard by removing old branches, leaves and dead parts, applying required amount of water, fertilisers and chemicals (pesticides); can preserve fruits by choosing the required technique according to their rate of damaging and added value.</i></p>				
<p>Materials: <i>Fruit trees, library, videos of citrus pruning, different materials for pruning and grafting, fruit trees, fruits to be processed and preserved as raw materials, cans, jalsies.</i></p>				

Topic Area: Crop and mushroom production and processing				
Agriculture S2		Unit 4: Legumes		No. of lessons: 16
Key unit Competence: The learner should be able to practice cultivation of legumes and the post-harvest of both soybeans and groundnuts.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - Define the legumes. - Explain the importance of legumes. - Explain the propagation methods of legumes. - Apply traditional practices of legumes. - Explain the post-harvest techniques 	<ul style="list-style-type: none"> - Recognise the legumes. - Select common legumes cultivated in Rwanda. - Practice legumes propagation methods. - Conduct legumes cultivation. - Perceive post-harvest techniques of soybeans, fodder and groundnuts. 	<ul style="list-style-type: none"> - Initiative to identify legumes cultivated in Rwanda. - Respect legumes propagation methods. - Pay attention while observing. - Have positive attitude towards colleagues. - Show concern while doing cultivation techniques of legumes. - Be careful when conducting traditional activities. - Pay attention while observing post-harvest operations of groundnuts, fodder and 	<ul style="list-style-type: none"> - Legumes names, types (fodder, edible by human) - Importance of legumes (soya, peas, beans and groundnuts, fodder: feed livestock, stakes for climbing crops, soil fertility and soil conservation). - Propagation methods of legumes (cuttings, seeds propagation, layering). - Traditional practices of legumes (land preparation, planting material, sowing, maintenance / 	<ul style="list-style-type: none"> - Field visit to explore the cultivated legumes and deduce their definition, types and importance (socio-economic, nutritive value). - Field visit to farms to observe and deduce after group discussion, the propagation methods for legumes. - Field work to conduct the traditional practices of legumes in groups of learners in the school garden. - Trip to farm to observe all post-harvest techniques of legumes

for legumes (soybeans, fodder and groundnut).		soybeans. - Be aware of post-harvest techniques of soybeans, groundnuts and fodder.	management and harvesting). - Post-harvest techniques for soybeans and groundnuts (<u>threshing & transport, drying, cleaning, handling, conditioning, packaging & storage</u>).	(harvesting, drying, cleaning, handling, packaging, conditioning and storage) and discuss on the ways they are done.
Links to other subjects: <i>Biology (reproduction in plants, animals and macroscopic fungi, plant asexual reproduction); Mathematics (calculation, surface and land measurement, geometry) and Home Science (nutrients).</i>				
Assessment criteria: <i>The learners can conduct a cultivation of legumes and post-harvest of both soybeans and groundnuts by selecting good seeds; can conduct a post-harvest techniques of both soybeans and groundnuts by removing the debris and other unwanted matters, well dried and storing them at good conditions; can conduct cultivation of fodder legumes due to required size of cuttings, planting manner and spacing.</i>				
Materials: <i>Grains of groundnut and soybeans, hoes, rakes, measuring types, pangas, pegs, ropes, sacs, labels, fodder legumes cuttings/seeds, library, computer laboratory with internet, school field and other small farm tools.</i>				

Topic Area: Animal production				
Agriculture S2		Unit 5: Ruminants		No. of lessons: 14
Key unit Competence: The learner should be able to conduct successfully ruminant rearing.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - Give examples of ruminant species and breeds. - Describe ruminant species and breeds by their physical appearance. - Explain the characteristics of ruminant breeds. 	<ul style="list-style-type: none"> - Recognise ruminant definition. - Observe ruminant species for deducing the differences. - Detect ruminant breeds. - Watch and distinguish ruminant breeds with comparison to their characteristics 	<ul style="list-style-type: none"> - Active participation in group discussion and interact positively with the colleagues. - Be aware of the differences between ruminant species and breeds. - Agree to the characteristics of ruminant' breeds. 	<ul style="list-style-type: none"> - Definition of ruminant. - Ruminant species reared in Rwanda (cattle, goats and sheep). - Ruminant breeds (cattle: Ankole, Frisian, Jersey; Goats: local, Alpine, Boar, Ethiopian Galla, Saneen; Sheep: local, mountain white, Merinos). - Characteristics of ruminant breeds. 	<ul style="list-style-type: none"> - Visit to Agricultural and Veterinary schools or ruminant farms to observe the ruminant species and indicate through discussion the differences between them by their characteristics. - Watching videos on different ruminant animals to find after group discussions, the different characteristics of each breed.

<ul style="list-style-type: none"> - Propose materials to construct a goat shelter. - Outline the characteristics of ruminant breeds to rear. - Identify the components of an appropriate diet for a goat. - Identify and describe common diseases of ruminants. - Carry out the sanitation rules in the ruminant farm. 	<ul style="list-style-type: none"> - Select and gather materials to construct a goat shelter. - Perform a goat shelter construction. - Recognise the characteristics of a good ruminant breed. - Practice goat feeding. - Proceed correctly in solving problems of the diseases. - Perform hygiene practice in ruminants' shelters. 	<ul style="list-style-type: none"> - Choose the required materials for a given activity. - Be attentive when identifying criteria of good ruminant breeds. - Take initiative to feed ruminants. - Be creative and attentive to solve problems of the diseases. - Take initiative to feed the ruminants. - Cooperate with the colleagues to carry out the sanitation rules. 	<ul style="list-style-type: none"> - Ruminants shelter standards. - Selection criteria of a breed to rear (goats and sheep: natural base width, muscling, volume and capacity, style and balance, growth potential, age; Cattle: head, top-line, the legs, main body and ribs, humps, hooves and pasterns, walking, fat and muscle for beef , udders, teat size, fertility, navel for the cows). - Feeding (fodder species for ruminants {fodder grasses and fodder legumes} and concentrates). - Ruminant diseases (Cattle: brucellosis, babesiosis, teireliosis , tuberculosis, bovine anaplasmosis, east coast fever, heart water, anteric; Goats: blue tongue, heart fever, vesicular stomatitis, caprine arthritis encephalitis, clostridial disease; Sheeps: blue tongue, cryptococcosis, heart fever, vesicular stomatitis). 	<ul style="list-style-type: none"> - Field visit to a multipurpose farm, to observe a goat shelter and the materials it is made of, and how they are arranged; discuss in groups, use standards and different operations to carry out constructing a goat shelter. - Field work to construct a standardised goat shelter according to the number of goats in one shelter. - Field trip to ruminant farms to find out the criteria (age, types of products, quantity of products, prolificity) taken into account when choosing good ruminant breeds for rearing. - Field trip to goat farms to find out the distributed food with a given frequency; in group discussion, extrapolate different ingredients of a goat's diet, and come up with a feeding plan as implemented in the farm. - Videos or pictures of the different goat diseases to be observed and list the characteristics (symptoms and damages) of each disease individually after the discussion in groups on the discovered characteristics (symptoms, damages) for each disease. - Field trip to a ruminant farms to find out the required activities to be performed and imitate them in the school farm.
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			- Sanitation (rules for a ruminant's farm sanitation).	
Links to other subjects: <i>Mathematics (geometry); Home Science (nutrition) and Biology (genetics and classification of animal organisms).</i>				
Assessment criteria: <i>The learners can differentiate the ruminant species and breeds by their characteristics; can construct a goat shelter according to the number of goats in one shelter with the sort of materials available in the area; can conduct goat feeding successfully in a goat farm considering the weight, production quantity, type of intended product and can find out/ recognise goat diseases and enemies in a goat farm by referring to their symptoms and damages.</i>				
Materials: <i>Ruminants farms, projector, CD-videos, ruminant shelter, construction materials, fodder and concentrates, water.</i>				

Topic Area: Animal production				
Agriculture S2		Unit 6: Livestock products		No. of lessons: 4
Key unit Competence: The learner should be able to preserve safely high quality livestock products.				
Learning objectives		Content	Learning Activities	
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - Discuss the importance of preservation. - Discuss on the operations of preservation of the products and by products of the cattle. - Describe preservation operations of the products and by products of pig. - Analyse the problem of poultry meat that needs a solution - Give real examples of rabbit products and operations of preserving them. 	<ul style="list-style-type: none"> - Recognise the importance of preservation. - See and find out the operations of preserving the products and by products of the cattle - See and find out the operations of preserving the products and by products of pig. - Recognise the products of rabbit that require preservation and indicate the best measures of their preservation. 	<ul style="list-style-type: none"> - Pay attention while discussing in groups. - Participate actively in group discussion and interact positively with the colleagues. - Be aware of the preservation operations of the products and by products of pig. - Read voluntarily and follow the mentioned instructions to solve problems. - Follow attentively and pay attention to interact with the others for discovering the required measures to preserve rabbit products. 	<ul style="list-style-type: none"> - Importance of preservation. - Preservation of cattle products (meat, milk, skin, ice cream, cheese, yogurt) and by products (tallow, gelatine, leather, blood, horns, bones). - Preservation of pig products (meat, lard) and by products (suede for shoes and clothing, gelatine for food and non-food uses). - Preservation of poultry products (meat, eggs). - Preservation of rabbit products (meat, fur for making socks). 	<ul style="list-style-type: none"> - Observation of destroyed products to identify their characteristics based on the smell, taste, look, colour, and deduce the importance of preservation after the group discussion. - Trip to livestock product processing industries and diaries, to observe and discuss on different operations carried out in preserving safely the livestock products.
Links to other subjects: Home science (nutrition) and Biology (biotechnology).				
Assessment criteria: The learners can identify the livestock products preserved badly according to their smell, colour, taste and physical appearance; can preserve livestock products safely by referring to the required operations.				
Materials: Damaged products, processing industries and diaries.				

Topic Area: Agriculture economics				
Agriculture S2		Unit 7: Problems and solutions of agriculture in Rwanda		No. of lessons: 4
Key unit Competence: The learner should be able to explain the problems and solutions of agriculture in Rwanda.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - Describe the problems faced in agriculture. - Explain the solutions to the problems that agriculture is facing. 	<ul style="list-style-type: none"> - Recognise the problems faced in agriculture. - Propose solutions to the problems faced in agriculture in Rwanda. 	<ul style="list-style-type: none"> - Show awareness of problems prevailing in agriculture. - Display courage in solving agriculture problems. 	<ul style="list-style-type: none"> - Problems faced in agriculture (land shortage, lack of capital, pests and diseases, instable prices, rainfall distribution, bad attitude towards agriculture). - Solutions to the problems that agriculture is facing (intensive agriculture, borrowing money from the banks, construction and maintenance of feeder roads, plant protection, searching proper market). 	<ul style="list-style-type: none"> - Research in internet or in the library and find out after the group discussion, the problems prevailing in agriculture. - Problem solving of a region faced to different problems (malnutrition, pests and diseases, shortage of land) and proposing the required solutions.
Links to other subjects: Geography (human economic geography, agriculture).				
Assessment criteria: The learners can explain the problems of agriculture in Rwanda and matching them with the adequate solutions				
Materials: Computer lab with internet, libraries.				

5.4 Agriculture S3

5.4.1 Key competences at the end of Senior Three

- Judge and apply a suitable applicable environment protection measures, conduct cultivation of cereals, ornamentals, high added value crops and fodder legumes and apply the processing and preservation of fruit products.
- Differentiate fish and bee species and breeds, conduct non ruminant rearing and integrated animal-fish farming, and provide comments on the cooperative farming and its contribution to agriculture's problem solving in Rwanda.

5.3.2 Table units

Topic Area: Soil science				
Agriculture S3		Unit 1: Soil		No. of lessons: 12
Key unit Competence: The learner should be able to identify types, causes, factors and effects of soil erosion, and carry out soil conservation practices.				
Learning objectives			Content	Learning Activities
Knowledge and understanding	Skills	Attitudes and values		
<ul style="list-style-type: none"> - Define soil erosion. - State the types of soil erosion. - Differentiate the causes of soil erosion. - State the factors affecting soil erosion. - Determine the effects of soil erosion. - State the factors affecting soil exhaustion. 	<ul style="list-style-type: none"> - Recognise the meaning of soil erosion. - Compare the types of soil erosion. - Examine the causes of soil erosion. - Recognise the factors affecting soil erosion. - Point out the soil affected by erosion. - Recognise the factors affecting soil exhaustion. 	<ul style="list-style-type: none"> - Show concern to the eroded soil. - Agree on the types of soil with group members. - Participate actively in group discussion. - Listen carefully to the colleagues. - Notice on the effects of soil erosion.. 	<ul style="list-style-type: none"> - Soil erosion definition. - Types of soil erosion (sheet erosion, rill erosion, gully erosion, soil exhaustion). - Causes/ agents of soil erosion (moving water, wind, animal, human being activities). - Factors affecting soil erosion (Rainfall, Topography/ relief, Vegetative cover/ nature, type of vegetation/ Type/nature of soil, Farming practices, Wind velocity) - Effects of soil erosion (desertification, loss of soil fertility). - Factors causing soil exhaustion (over cropping, leaching, overgrazing, burning of plants, soil conservation/good farming practices, crop rotation adding fertilisers, mixed cropping, mulching, weeding, avoiding overgrazing, techniques such as contour farming, terracing, strip cropping). 	<ul style="list-style-type: none"> - Field visit in school compound or to the environment (hill sides) to observe and find out the signs of erosion in that area; identify the types of eroded soils and causes of erosion after the group discussion. - Field visit in school compound or to the environment (hill sides) to observe that the hill sides are protected against erosion and through group discussion identify the protective

<ul style="list-style-type: none"> - Describe environment conservation measures. - Carry out environment conservation measures. 	<ul style="list-style-type: none"> - Perceive various measures of environment protection conservation. - Practice various measures of environment protection and conservation. 	<ul style="list-style-type: none"> - Appreciate the importance of environment conservation. - Show awareness and interest about the protected environment. 	<ul style="list-style-type: none"> - Prevention methods of soil erosion control (mulching, reforestation, terracing, contour ploughing, strip cropping, cover cropping, reduction of grazing). - Various measures for soil conservation: <ul style="list-style-type: none"> ○ Traditional measure (crop rotation, mulching, afforestation and permanent pasture, windbreaks). ○ Mechanical methods/physical/ structural control (terracing: bench terraces & progressive terraces, ridges, graded bands, diversions channels, anti-erosive ditches, stone lines, trash lines, filters strip, gabions/porous dams) measures. 	<p>measures applied.</p> <ul style="list-style-type: none"> - Problem solving: protecting hill sides against erosion (high sloped land or hill sides in surrounding) by proposing and practicing appropriate environment protection measures (terracing: bench terraces, ridges, graded bands, diversions channels, anti-erosive ditches, stone lines)
<p>Links to other subjects: Geography, Chemistry, Mathematics (geometry) and Biology (classification and diversity of plants and animals).</p>				
<p>Assessment criteria: The learners can judge the eroded soils considering rainfall, topography/relief, vegetative cover/nature, type of vegetation, type/ nature of soil, farming practices; can carry out an adequate environment protection measures according to the slope, soil type (texture and structure) and vegetation.</p>				
<p>Materials: Eroded land, hills (sloped lands), tape measure, rectangular frame, carpenter level, triangle frame, pegs.</p>				

Topic Area: Crop and mushroom production and processing				
Agriculture S3		Unit 2: Cereals		No. of lessons: 8
Key unit Competence: The learner should be able to conduct cultivation of cereals.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - State the characteristics of cereals. - Give examples of cereals grown in Rwanda. - Discuss the importance of cereals. - Explain the traditional practices done on cereals. 	<ul style="list-style-type: none"> - Detect the characteristics of cereals. - Select the common cereals cultivated in Rwanda. - Recognise the importance of cereals. - Conduct cereal cultivation. 	<ul style="list-style-type: none"> - Agree to the characteristics of cereals. - Be aware of cereals cultivated in Rwanda. - Appraise the importance of cereals. - Show team spirit in research and group discussions. - Show concern while doing cultivation techniques of cereals. 	<ul style="list-style-type: none"> - Botanical characteristics of cereals (herbaceous, narrow leaves, buds and flowers on inflorescence). - Some cereals cultivated in Rwanda (rice, maize, sorghum, wheat). - Importance of cereals (nutritional value: vitamins, minerals, carbohydrates, fats, oil and proteins). - Agricultural importance: mulch, organic manure production. - Traditional practices of cereals (land preparation, sowing, fertilisation, maintenance, harvesting). 	<ul style="list-style-type: none"> - Field visit to explore the cultivated cereals and to observe their characteristics. - Search in the internet or library, the different cereals cultivated in Rwanda. - Group discussion on the importance of cereals. - Make presentation on the importance of cereals. - Field work to conduct some of traditional practices (land preparation, sowing, fertilisation, weeding earthing up) of cereals by demonstration.
Links to other subjects: Biology (structure of flowering plants parts).				
Assessment criteria: The learners can conduct the cultivation of cereal, referring to cultural practices such as fines of soil, quantity of fertilisers and the seeds to be applied per unit area.				
Materials: Cereals seeds, school field, hoes, computers laboratory with internet and others small farm tools				

Topic Area: Crop and mushroom production and processing				
Agriculture S3		Unit 3: Ornamentals		No. of lessons: 8
Key unit Competence: The learner should be able to conduct a cultivation of a range of ornamental plants.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - Define ornamental plants. - Give examples of ornamentals in Rwanda. - Discuss the importance of ornamental plants. - Explain the different methods of ornamental propagation. - Explain the traditional practices done on ornamental plants. 	<ul style="list-style-type: none"> - Recognise the meaning of ornamental plants. - Select common ornamentals cultivated in Rwanda. - Recognise the importance of ornamental plants. - Conduct propagation methods of ornamental plants. - Conduct ornamental cultivation. - Carry out the pruning for some cultivated ornamentals. 	<ul style="list-style-type: none"> - Take care to find the significance of the ornamentals. - Notice the main ornamentals grown in Rwanda. - Appraise the importance of the ornamental plants. - Be careful when watching video follow all the steps of each activity. - Show concern while doing traditional practices of ornamentals. - Avoid risks when conducting traditional practices. 	<ul style="list-style-type: none"> - Ornamental's definition. - Some ornamentals cultivated in Rwanda (roses, durantha, palms, anthurium, bougainvillea). - Importance of ornamental plants (adds beauty, fragrance, attract wild life, clean air, ceremonial and religious use). - Propagation methods of ornamental plants (cuttings, budding, grafting, splitting, seed propagation, layering). - Traditional practices of ornamentals (planting, pruning, fertilisation, watering, mulching, weed control, pest management). 	<ul style="list-style-type: none"> - Research in internet or in the library through group discussion and presentation, on the importance of ornamental plants grown in Rwanda. - Field visit to observe and explore the ornamental plants grown in Rwanda and perform their cultivation in the school garden. - Watch video that shows the propagation methods of ornamentals and discuss the process on how they are done. - Field work to conduct traditional practices of ornamental plants. - Practical work on ornamental's pruning.
Links to other subjects: <i>Biology (reproduction in plants, animals and macroscopic fungi).</i>				
Assessment criteria: <i>The learners can conduct the propagation methods with required size of cuttings, spacing and planting manners; can conduct cultural practices such as fines of soil, quantity of fertilisers required and pruning.</i>				
Materials: <i>Ornamentals seedlings, library, internet, different tools for grafting and others small farm tools.</i>				

Topic Area: Crop and mushroom production and processing				
Agriculture S3		Unit 4: Fodder		No. of lessons: 8
Key unit Competence: The learner should be able to successfully conduct cultivation of fodder grasses.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - Define the fodder grasses. - Discuss the importance of fodder grasses. - Explain the propagation methods of fodder grasses. - Express the traditional practices done on fodder grasses. 	<ul style="list-style-type: none"> - Perceive the fodder grasses grown in school surrounding. - Recognise the importance of fodder grasses grown in Rwanda. - Stand for the propagation methods of fodder grasses. - Conduct fodder grasses cultivation. 	<ul style="list-style-type: none"> - Appraise the importance of fodder grasses. - Take care while searching the methods of propagation of fodder grasses. - Be careful when conducting traditional activities. 	<ul style="list-style-type: none"> - Definition of fodder grasses. - Importance of fodder grasses (feed livestock, stakes for climbing crops, soil fertility and soil conservation). - Propagation methods of fodder grasses (cuttings, seeds propagation, layering). - Traditional practices of fodder grasses (planting, weeding, harvesting). 	<ul style="list-style-type: none"> - Field visit to explore all fodder grasses found in the surrounding of the school, to discuss in group on their definition and importance. - Using the internet, the learners search on the propagation methods of fodder grasses and make presentation per group. - Field work to conduct traditional practices of fodder grasses.
Links to other subjects: <i>Biology (reproduction in plants, animals and macroscopic fungi) and Mathematics (calculations).</i>				
Assessment criteria: <i>The learners can conduct cultivation of fodder grasses according to the required size of cuttings, planting manner and spacing</i>				
Materials: <i>Fodder grasses cuttings/seeds, library, computer laboratory with internet, school field, hoes and other small farm tools.</i>				

Topic Area: Animal production				
Agriculture S3		Unit 5: Animals		No. of lessons: 8
Key unit Competence: The learner should be able to recognise fish species by their characteristics and make successfully a bee hive.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - Explain the characteristics of fish species. - Describe the differences between fish species. - State the characteristics of fish species and breeds to rear. 	<ul style="list-style-type: none"> - Find out the fish species with comparison to their anatomic characteristics. - Select fish species to rear. 	<ul style="list-style-type: none"> - Observe attentively the fish species and their characteristics. - Participate actively in group discussion and interact positively with the colleagues. - Be attentive in choosing the fish species and breeds to rear. 	<ul style="list-style-type: none"> - Fish species (limnotrisa miodon, clarias, tilapia, limnotrisa apocromis, carp) and their main characteristics. - Select criteria suitable for fish species to rear. 	<ul style="list-style-type: none"> - Pictures of different fish species to be observed and discuss in groups on their anatomy characteristics. - Research on internet or in the library to find out the selection criteria of suitable species to rear and make presentation of work after the group discussion.
<ul style="list-style-type: none"> - Define bee keeping and explain its importance. - State the categories of bees. - Explain the process of making a bee hive. - Carry out the 	<ul style="list-style-type: none"> - Perceive bee hives containing bees and its importance. - Recognise the categories of bees by their characteristics. - Make bee hive. 	<ul style="list-style-type: none"> - Agree with the colleagues on the definition and importance of bee keeping. - Pay attention and be attentive while observing the bee categories and their characteristics. - Show concern to make a 	<ul style="list-style-type: none"> - Definition of bee keeping. - Importance of bee keeping. - Category (sort of) bees (queen, workers and males). - Making of bee hive (materials and 	<ul style="list-style-type: none"> - Field trip to apiaries, to observe and find out the bee categories by their characteristics through group discussion. - Group work: to make bee hive, management and harvesting of already made bee hive.

management of bee hive and harvesting of honey bee.	- Practice management activities of bee hive and harvest honey bee.	bee hive. - Be careful and avoid risks to yourself and others while managing bee hive and harvesting honey.	process). - Management of bee hive and harvesting of honey bee.	
Links to other subjects: <i>Biology (genetics and classification of animal organisms).</i>				
Assessment criteria: <i>The learners can recognise fish species by their external characteristics such as fins, rays and spines, body types/lifestyles, gill structure, mouth shapes/diets; can recognise the selection of fishes criteria by referring to the manner of fish rearing; can recognise bees categories by their size, colour in general, shape, function within the same specie; can construct bee hive according to the required standards.</i>				
Materials: <i>Fish pictures, library, computer laboratory with internet, Apiary, hives, raw materials for a hive.</i>				

Topic Area: Animal production				
Agriculture S3		Unit 6: Animals		No. of lessons: 12
Key unit Competence: The learner should be able to successfully conduct a rearing of poultry and pigs.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - Explain the conditions suitable for aviary and pigsty. - State the materials used to construct an aviary and a pigsty. - Carry out a construction of an aviary and a pigsty. 	<ul style="list-style-type: none"> - View the standards of aviary and pigsty. - Select and gather materials to construct an aviary and a pigsty. - Construct an aviary and a pigsty. 	<ul style="list-style-type: none"> - Be active in the discussions and be attentive in observing the construction of an aviary and a pigsty. - Manipulate carefully an aviary and a pigsty construction material. - Participate willingly in the construction of an aviary and a pigsty 	<ul style="list-style-type: none"> - Standards of aviary and pigsty. - Fitting materials to construct an aviary and a pigsty. - Aviary and pigsty construction. 	<ul style="list-style-type: none"> - Field visit to non-ruminant (pig, poultry) farms to observe, what the shelters and materials are made of and how they are arranged; discuss in groups the different operations to carry out in constructing these shelters. - Field work to construct a standardised aviary according to their sex, number of poultries and a pigsty according to their sex, age and development stage.

<ul style="list-style-type: none"> - List the ingredients of an appropriate diet for the pig or poultry. - List the ingredients of an appropriate diet for the pig or poultry as per their growth age. - Describe a feeding plan for a pig or poultry. - Describe a feeding plan for a pig or poultry. 	<ul style="list-style-type: none"> - Select an appropriate food for a pig. - Select an appropriate diet for the poultry. - Practice pig feeding/imp lement a pig feeding plan. - Practice poultry feeding/imp lement a poultry feeding plan. 	<ul style="list-style-type: none"> - Participate actively in group discussion and interact positively with the colleagues. - Observe attentively the food distribution operation for both pigs and poultry. - Be careful and cautious while distributing food for pig and poultry. 	<ul style="list-style-type: none"> - Non ruminants (poultry, pig) feeding: <ul style="list-style-type: none"> o Food for pig (diets: grain offal=industrial by-products, tubers, blood flour, grasses, concentrates, water, oil cakes). o Food for poultry (diets: grain offal, insects, fodder, gramineae’s grains, blood flour, oil cakes). o Pig feeding (quantify concentrates) due to the development stage. o Poultry feeding (quantifyconcentrates) due to the development stage, species, breeds. 	<ul style="list-style-type: none"> - Field trip to the pig and poultry farms to find out the distributed food with a given frequency; in group discussion extrapolate different ingredients of pig or poultry diets and come up with a feeding plan according to the development stage, species, breeds.
<ul style="list-style-type: none"> - Identify the names and describe pig and poultry’s common diseases and enemies. - Describe the health control methods in pig and poultry farms. - Apply sanitation rules in the 	<ul style="list-style-type: none"> - Recognise the pig and poultry diseases by their visible symptoms in the farms. - Practice rules of sanitation in the pig or poultry 	<ul style="list-style-type: none"> - Be active in group discussion and interaction. - Have a positive attitude when interacting with the colleagues. - Be attentive and diligent in observing a sick pig and poultry and the sanitarian state of the farms. - Be attentive and cautious in implementing the prophylactic plan in pig and 	<ul style="list-style-type: none"> - Pig and poultry diseases and enemies and their characteristics (causes, symptoms, damage and control). - Pig diseases (teniosis, pasteurellosis, brucellosis, porcine epidemic diarrhea, coccidiosis). - Poultry diseases (Newcastle disease, pullorum disease, coccidiosis, mycotoxicosis, 	<ul style="list-style-type: none"> - Watch video of pig diseases to match each disease with its characteristics, individually and through group discussion. - Field visit to the farms of pig and poultry, where the learners observe and find out the diseases and enemies and propose the required solutions for

ruminant farm,	farm.	poultry farms. - Cooperate with the colleagues to carry out the sanitation rules.	Marek's disease. - Farm sanitation (rules for a pig and poultry farm sanitation).	them. - Practicing of hygiene in a pig or poultry farms.
Links to other subjects: <i>Mathematics (geometry); Biology (health and diseases, classification of animal organisms.)</i>				
Assessment criteria: <i>The learners can construct correctly the standardised aviary according to the sex, number of poultries, and pigsty due to their sex, age, development stage; can conduct feeding of pig and poultry successfully in their farms considering the species, breeds for poultry only and the development stage for both.</i>				
Materials : <i>Aviary, piggery, timbers, bricks, cement, water, iron sheet, nails, videos of pig and poultry diseases and enemies, drugs used in disease prevention, materials used in distributing drugs.</i>				

Topic Area: Animal production				
Agriculture S3		Unit 7: Integrated livestock-fish farming		No. of lessons: 14
Key unit Competence: The learner should be able to successfully run and manage an integrated livestock-fish farm.				
Learning objectives			Content	Learning Activities
Knowledge and Understanding	Skills	Attitudes and Values		
<ul style="list-style-type: none"> - Define and describe the integrated livestock fish farms. - Explain the importance of integrated livestock-fish farming. - Describe the types of integrated livestock-fish farming systems. 	<ul style="list-style-type: none"> - Recognise the integrated livestock- fish farms. - Find out the types of integrated livestock-fish farms 	<ul style="list-style-type: none"> - Be attentive in observing the integrated livestock-fish farms. - Take initiative of observing the integrated livestock-fish farms for deducing its importance. - Show concern to the types of integrated livestock-fish farms. 	<ul style="list-style-type: none"> - Definition of the integrated livestock-fish farms. - Importance of integrated fish farm. - Types of integrated livestock-fish farms as per the animals reared and the features of animal species and breeds reared (fish-poultry, fish-poultry-vegetables, fish-rabbit-vegetables). 	<ul style="list-style-type: none"> - Pictures or videos of the integrated livestock- fish farms where the learners observe attentively and discuss in groups to find out the components (e.g. poultry and fish) of that integration. - Field visit on the integrated livestock- fish farms, to observe and find out the types of integrated livestock-fish reared and its advantages, after the group discussion.

<ul style="list-style-type: none"> - Explain the conditions suitable for the shelters in the integrated livestock-fish farming. - Describe the technique of constructing integrating livestock-fish farming. - Describe the maintenance operations in the integrated livestock-fish farming. 	<ul style="list-style-type: none"> - Select and gather materials to construct shelters in the integrated fish farming. - Construct shelters in the integrated livestock- fish farming. - Carry out the maintenance operations in a fish pond. 	<ul style="list-style-type: none"> - Be concerned by fitting matrix and standards. - Be careful in constructing an integrated livestock-fish infrastructure. - Be careful in maintaining the integrated livestock-fish farming infrastructure. 	<ul style="list-style-type: none"> - Integrated livestock-fish farming infrastructure. - Construction of materials of integrated livestock-fish farm and constructing an integrated livestock-fish pond. - Management and maintenance of the integrated livestock-fish infrastructure (cleaning up the banks, management of water level, cleaning of aviaries and hutch). 	<ul style="list-style-type: none"> - Field visit on the integrated livestock-fish ponds to observe and find out what are shelters and materials made of and how they are arranged; discuss in groups the different operations to carry out in constructing these shelters. - Problem solving: choosing materials (cement or not, wood or not) to be used due to economic status and soil nature. - Practical experience: to construct a standardised integrated livestock-fish farm according to the number of fish and species.
<ul style="list-style-type: none"> - List the ingredients of an appropriate diet for the fish. - Define fertilisation of a fish pond. - Carry out the feeding of the fish. 	<ul style="list-style-type: none"> - Select health food for fish reared. - Practice fish feeding. 	<ul style="list-style-type: none"> - Participate actively in group discussion and interact positively with colleagues while selecting food for fish. - Observe attentively the food distribution operation. - Manipulate carefully and cautiously the fish food when 	<ul style="list-style-type: none"> - Fish food and fertilisation (grain offal, herbs, concentrates, compost, livestock dung). - Feeding (quantity) due to the size of pond, type of species. 	<ul style="list-style-type: none"> - Field trip to the integrated fish farming, to find out the distributed food with a given frequency; in group discussion extrapolate different ingredients of fish diets and come up with a feeding plan referring to number of fishes and type of reared species. - Research in internet or in the school library and come up with the definition of fertilising a fish pond through the group discussion.

		distributing them.		
<ul style="list-style-type: none"> - Identify the names and describe the common diseases of fish. - Explain a prophylactic plan in the integrated livestock-fish farms. - Apply the rules for integrated fish farm sanitation. 	<ul style="list-style-type: none"> - Recognise the fish diseases through visible symptoms in the integrated fish farms. - Make a prophylactic plan in the integrated fish farming. - Practice rules for integrated fish farm sanitation. 	<ul style="list-style-type: none"> - Observe attentively the fish ponds affected by the enemies or diseases. - Implement attentively and cautiously the prophylactic plan in an integrated fish farm. - Cooperate with colleagues to carry out the sanitation rules. 	<ul style="list-style-type: none"> - Fish pond enemies (Nematodes worms, birds, bees,) and diseases (Columnaris, gill disease, dropsy, fin-rot, hole in the head, pop-eye, cloudy-eye, water quality induced diseases, fungal diseases), characteristics (causes, symptoms, damage and control). - Fish pond sanitation. 	<ul style="list-style-type: none"> - Watch video of fish diseases and match each disease with its characteristics, individually and through group discussion.
<p>Links to other subjects: <i>Mathematics (geometry), Biology (health and diseases, genetics and classification of animal organisms, nutrition),</i></p>				
<p>Assessment criteria: <i>The learners can describe livestock fish farming systems according to their components; can construct a required integrated fish farming systems according to the number of fishes and type of fish species; can conduct feeding of fishes correctly, referring to the number of fishes, type of reared species; can find out/ recognise fish diseases and enemies by referring to their symptoms and damages.</i></p>				
<p>Materials: <i>Fish ponds, videos, pictures or charts of the integrated-fish farming systems, cements, woods, iron sheet, hoes, pangas, nails, video, projector, fish ponds, different ingredients of fish diet</i></p>				

Topic Area: Agriculture economics				
Agriculture S3		Unit 8: Cooperative farming		No. of lessons: 2
Key unit Competence: The learner should be able to explain the cooperative farming and its contribution to agro-economic problem solving in Rwanda.				
Learning objectives			Content	Learning Activities
Knowledge and understanding	Skills	Attitudes and values		
<ul style="list-style-type: none"> - Describe the importance of cooperatives in Rwanda and the production growth. - Classify the cooperatives. - Explain the principles of cooperatives. - State the factors necessary for cooperative's success, 	<ul style="list-style-type: none"> - Defend the importance and values of cooperatives using examples. - Recognise the types of cooperatives. - Defend cooperative's principles. - Criticise the necessary factors involved in the success of cooperatives. 	<ul style="list-style-type: none"> - Appreciate the importance of cooperatives. - Promote cooperative's values. - Understand the perspectives of cooperatives in problem solving. - Be aware on the principles of cooperative. - Show concern to state the factors of cooperative success. 	<ul style="list-style-type: none"> - Importance and values (self-help, self-responsibility, democracy, equity, equality and solidarity) of cooperatives in the production growth. - Types of cooperatives (producer co-operatives, multi-stakeholder co-operatives, worker co-operatives, worker-shareholder co-operatives, consumer co-operatives). - Principles of cooperative (voluntary and open membership, democratic member control members, economic participation, autonomy and independence, education, training and information, cooperation among cooperatives, concern for the community). - Factors necessary for the success of a cooperative (structure, culture and risks). 	<ul style="list-style-type: none"> - Group discussion on the types and principles of cooperatives based on their goals.
Links to other subjects: <i>Economy (Management of cooperatives).</i>				
Assessment criteria: <i>The learners can recognise the types of cooperatives based on their goals.</i>				
Materials: <i>Computer room with internet connection.</i>				

6. REFERENCES

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7. APPENDICES: Weekly time allocation for lower secondary

SUBJECTS AND WEEKLY TIME ALLOCATION FOR ORDINARY LEVEL

Core subjects	Weight (%)	Number of Periods (1 period = 40 min.)		
		S1	S2	S3
1. English	11	5	5	5
2. Kinyarwanda	7	3	3	3
3. Mathematics	13	6	6	6
4. Physics	9	4	4	4
5. Chemistry	9	4	4	4
6. Biology and Health Sciences	9	4	4	4
7. ICT	4	2	2	2
8. History and Citizenship	7	3	3	3
9. Geography and Environment	7	3	3	3
10. Entrepreneurship	4	2	2	2
11. French	4	2	2	2
12. Kiswahili	4	2	2	2

13. Literature in English	2	1	1	1
Sub Total		41 periods	41 periods	41 periods
II. Elective subjects: Schools can choose 1 subject				
Religion and Ethics	4	2	2	2
Music, Dance and Drama	4	2	2	2
Fine arts and Crafts	4	2	2	2
Home Sciences	4	2	2	2
Farming (Agriculture and Animal husbandry)	4	2	2	2
III. Co-curricular activities (Compulsory)				
Physical Education and Sports	2	1	1	1
Library and Clubs	2	1	1	1
Total number of periods per week	100	45	45	45
Total number of contact hours per week		30	30	30
Total number of hours per year (39 weeks)		1170	1170	1170