BANANA

TEACHING AND LEARNING FRAMEWORK

Developed by Ministry of Education, Sport, Arts and Culture
with support from SNV Netherlands Development Organization

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1. INTRODUCTION

This framework has been developed based on the premises that people in certain areas make a living of the farming of fruits. In this specific case it is bananas. While people are growing banana based on proven techniques, new methods and inputs can increase production and improve the quality of produce.

In the area where this framework was developed, new agronomic practices in banana farming were introduced to the farmers of today. Children were not included when these skills and knowledge were transferred, even though many will be the farmers of tomorrow.

This framework can be used to practically teach children new methods and skills in banana growing. Apart from developing this framework, a more detailed reference guide for the agricultural teachers and pupils on the specifics of the banana growing has been developed.

2. AIMS AND OBJECTIVES

2.1 Aims of the Banana Course

- To develop a positive attitude towards banana growing, and to foster good banana growing practises in pupils.
- To help pupils appreciate the importance of bananas in their lives (economic, nutrition).
- To help pupils acquire basic conservation principles.
- To help pupils appreciate their environment in relation to banana production.
- To help pupils understand the science of the banana plant.

2.2 Objectives of the Banana course

Objectives were formulated per aim:

To develop a positive attitude towards banana growing, and to foster good banana growing practises in pupils. Pupils should be able to:

- identify suitable plots for planting bananas
- prepare land and banana planting stations
- plant and nurture a banana plantation
- demonstrate the activities involved in banana growing
- list and identify common pests and diseases that affect bananas

To help pupils appreciate the importance of bananas in their lives (economic, nutrition). Pupils should be able to:

- identify viable markets and products for the banana(plant)
- differentiate between different markets for bananas and their advantages
- calculate profitability and explain who to make money from bananas
- identify and prepare different banana dishes
- identify different benefits of the banana(plant)
- explain the nutritional value of bananas

To help pupils acquire basic conservation principles. Pupils should be able:

- identify and apply methods to control erosion in banana plantations
- identify and apply water conservation techniques

To help pupils appreciate their environment in relation to banana production. Pupils should be able to:

- identify and explain favourable conditions (season/geography, soil) for banana growing
- describe how the banana plant can conserve the environment
- decide on suitability of different areas for growing bananas

To help pupils understand the science of the banana plant. Pupils should be able to:

- identify different parts of the banana plant
- list functions of the different parts of the banana plant choose suitable varieties for different areas

3. SCOPE & SEQUENCE CHART

Grade 4	Grade 5	Grade 6	Grade 7
TOPIC 1: THE BANANA PLANT			
There are different types/ varieties of the banana plant	Different banana types/ varieties originate from different parts of the country/ world	The banana plant has a history	The banana plant grows like any other green plant. Science of the banana plant
The banana plant has no seeds, but is grown from its tuber (suckers)	Banana plant can be made to grow from the mother plant	The banana plant has one life cycle	Propagation of the banana plant can be from any other part of the plant (tissue culture)
	Banana plant has different parts which have different functions	The parts of a banana plant are useful material (Theory)	There are advantages and disadvantages of the different ways of propagating the banana plant
TOPIC 2: THE PRODUCTS			
The Banana fruit can be used for food and income	Bananas are nutritious fruits	Some varieties are eaten raw whilst others are cooked first	There are several local banana dishes that can be prepared
Various products come from the banana fruit	Banana fruit can be processed into different by-products	There are various items which can be made from the various plant material (Practical)	Value can be added to the banana fruit
TOPIC 3: SITING OF THE BANANA PLANTATION			
Bananas grow/ do very well in some areas than others	Banana plants do well in some soils than others	One has to consider terrain and altitude in siting a banana plot	Different climatic conditions have different effects on the banana plant
A banana plot needs security	There are different types of security measures for the banana plant	Perennial water supply is essential to a banana plot	Water availability is a pre-requisite for siting a banana plot
	A lot of caution has to be exercised if siting is on an old site where bananas grew before		
TOPIC 4: LAND PREPARATION FOR A BANANA PLANTATION			
Land needs to be thoroughly and carefully cleared before planting	Clearing methods depend with what is on the plot	Land preparation has to be done in good time	There are different measurements used for in-row and inter-row spacing
			Spacing determines yields and effective land use

Grade 4	Grade 5	Grade 6	Grade 7
TOPIC 5: PLANTING OF THE BANANA PLANT			
Varieties of bananas and planting. Different varieties of the banana plant are planted with different specifications	Timing of planting and sucker selection; e.g Best time for planting is January and August in Zimbabwe	Measurement of holes, tools and sucker selection for establishment	Fertilizer application for different types of soils, watering and sucker selection for succession
TOPIC 6: MAINTENANCE OF THE BANANA PLANTATION			
Watering, slashing and mulching	The different types of soil erosion, their effects and how to combat soil erosion.	Fertilizer application, trimming and propping	Pests and disease control, looking at mole rat, nematodes. De-suckering
	The different types of pests that affect the banana plant and different ways of pest control		
TOPIC 7: HARVESTING AND MARKETING OF THE BANANA FRUIT			
How to tell if the banana fruit is ready for harvesting and the ripening process.	Exercising hygiene in handling and grading the banana fruit	Products of the banana fruit. Market value and available markets for different products of the banana fruit	Yield estimation and profit calculation.
	Steps involved in handling and grading the banana fruit	Best ways to store and transport the banana fruit	

4. CONTENT AND METHODOLOGY

Grade 4	Grade 5	Grade 6	Grade 7
TOPIC 1: THE BANANA PLANT			
Key concepts: As on the scope and Sequence diagrams Objectives: Pupils will: 1. Name and list different types of bananas grown locally 2. Identify suckers from a mother plant	1. Name and list other varieties found in other countries 2. Demonstrate and explain how a banana plant is grown from its suckers 3. Locate on the map of Africa Banana growing countries 4. Name and list the different parts of the banana plant and state their functions	1. Narrate the history of the banana plant. Pupils will look at the origin and how it spread to other parts of the world. 2. Explain the life cycle of the banana plant using a diagram 3. Describe materials/ items that can be made from the banana material	1. Describe how plant food is made in the banana plant through photosynthesis 2. Describe how the banana plant can be made to grow from any other part of the plant (tissue culture) 3. State the advantages and disadvantages of the different ways of propagating the banana plant
Suggested Learning Activities • Children should name and list the different varieties of bananas they know locally • Children can bring samples of fruits or plants of the different varieties found or grown locally • Children will investigate to find if bananas have seeds • Children then identify suckers on banana stations • Children establish where these will be growing from	• Children to name and list other varieties of bananas • Children to investigate and establish their origins, i.e parts of the country or world • Children to investigate how bananas grow from mother plant • Pupils identify, name and list the different parts of a banana plant and state their functions using a live plant • Children draw and label a banana plant and its parts	• Children to come up with the history of the banana plant through a discussion • Children to read and narrate the history of the banana plant in groups or pairs • Children to investigate and explain what happens to the mother plant after fruit is harvested • Children to state items made from plant material • Children to make some of the items using banana materials	• Children to investigate the philosophy of the banana plant • By using a live plant, children will establish that it respires and transpires. Children will tie a transparent plastic bag to the leaf of a banana plant to establish that it transpires • Pupils explain with the use of a diagram how nutrients move from the soil and turned into plant food through the process of photosynthesis • Children to explain the science of tissue culture • Children state the

Suggested Learning Resources • Samples of local banana varieties (species and types) • A banana plantation	• Map of Africa • Pictures and samples of other varieties of bananas • The banana plant (suckers)	• Text on history of the banana plant • Banana life cycle diagram • Sample of useful banana plant matter	advantages and disadvantages of the different ways of banana propagation • A living banana plant • Transparent plastic bag • A diagram of movement of nutrients in a plant • Banana seedlings
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**
TOPIC 2: THE PRODUCTS			
Key Concepts: As on scope and sequence chart Objectives: Pupils will; 1. Suggest the purposes the banana fruit is use for 2. Name and list the products that can be made from the banana fruit Suggested Learning activities • Using previous experience, children will say what bananas are used for • Children will discuss and list the various by products that come from the banana fruit Suggested Learning Resources • Samples of pictures of bananas or their products • Ripe banana fruits	1. Explain the nutritional value of the banana fruit 2. Identify, name and list some of the by products of the banana fruit • From knowledge of food pupils explain the nutritional value of the banana fruit. Children will establish that it gives us Vitamin C • Pupils explain how the banana fruit can be processed into by-products • Children name and list these by-products • Children collect pictures of the banana by-products • Banana fruits • Samples or pictures of banana dishes • Cooking utensils and firewood	1. identify and list banana dessert varieties (eaten raw) and those that are cooked first 2. Make items from banana plant material • Children name and list the varieties of bananas eaten raw and those that are cooked first • Children establish that some countries take bananas as their staple food and name them • Children identify these on the map of Africa • Children demonstrate and explain how items can be made from banana material. • As a project, children make some of these products for classroom display • Sample pictures of banana dishes • Ingredients required to prepare dishes • Banana plot and materials	1. Prepare local banana fruit dishes 2. Explain how value can be added to the banana fruit • Children name and list local banana dishes they know • Pupils demonstrate and explain how these are prepared • Children establish and explain that the banana fruit can be value added (processed into some other products) • Children collect pictures of some of the banana by products (value added) • Banana fruit • Ingredients to prepare local banana dishes • Samples or pictures of prepared banana dishes

Grade 4	Grade 5	Grade 6	Grade 7
TOPIC 3: SITING OF THE BANANA PLANTATION			
Key Concepts: As in Scope and Sequence Chart Objectives: pupils will; 1. Identify and list areas where bananas grow best 2. Suggest the types of security measures required for a banana plant or plot	1. Identify and list different types of soils and say which best suit banana growing 2. Discuss and explain the types of security measures needed to protect the banana plant 3. Explain dangers of siting a banana plot where bananas grew before	1. Identify and discuss the terrain and altitude that best suit the banana plant 2. Demonstrate , compare, contrast and explain the importance of a perennial water supply	1. Identify climatic conditions that best suit banana growing and those that do not 2. Demonstrate and explain the importance of water to a banana plot siting
Suggested Learning Activities • Children name and list areas they know in Zimbabwe where bananas are grown. They should come up with reasons why bananas are grown in those areas • Children identify and say what threats are there for the banana plant and fruit. They suggest what type of security is needed for each type of threat or danger	• Pupils name the types of soils they know. They investigate in which type of soils the banana does best • Children explain why this is so • Pupils discuss the dangers of siting a banana plot on an old field where bananas grew before • Pupils explain the security measures required to protect a plant	• Children discuss and describe how terrain and altitude are important in siting a banana plot • Pupils experiment to see the effects of perennial water supply. Children will set up two plots. On one they water and on the other they wait for the natural rains. They will then observe, compare and contrast over a period of about one year	• Children find out the various climatic conditions in Zimbabwe • They discuss which ones best suit the growing of bananas • Pupils establish the effects of cold on the banana plants • Children demonstrate why the siting of a banana plot has to be near a reliable water source
Suggested Learning resources • Visit to a banana plot • Map of Zimbabwe	• Map of Zimbabwe • A visit to a banana plot (old and new sites) • Poles, fence, gum seedlings etc.	• Map of Africa • A visit to a banana plot • Demonstration plots	• World map • Chart on climatic conditions • Banana plantations

Grade 4	Grade 5	Grade 6	Grade 7
TOPIC 4: LAND PREPARATION FOR A BANANA PLANTATION			
Key Concepts: As on Scope and Sequence charts			
Objectives: Pupils will; 1. Suggest and give reasons why land needs clearing first before planting anything	1. Identify and list the various obstacles that need clearing from plot site	1. state best times suitable for land clearing 2. explain why June to August is best for land clearing and why November to February is best for planting	1. Carry out field work, demonstrate and measure out in-row and inter- row spaces on banana plot 2. Discuss and explain why spacing is very important
Suggested Learning Activities • Pupils discuss and suggest various ways of clearing land. They give reasons for clearing the land	• Pupils name and list the various obstacles found on land needs to be cleared • Pupils suggest ways of clearing the land • Children point out that it is another point of consideration when choosing a site • Children find out why these obstacles need to be removed	• Children say that land preparation (preparation) has to be done when it is dry. They explain that it is not possible to clear land when it is raining • Pupils discuss and suggest that land preparation has to be done on time so that planting coincides with the rains	• Pupils use their mathematical knowledge to demonstrate and measure in and inter row spacing (2.4m *2.5m etc) • Pupils observe and establish that correct spacing is important for better yields and maximum land use
Suggested Learning Resources • A visit to any site	• A visit to any new site • A visit to a plantation	• Banana plantation • Water (rain)	• Banana plantation • Meter rulers, garden lines regs, hammers etc

Grade 4	Grade 5	Grade 6	Grade 7
TOPIC 5: PLANTING OF THE BANANA PLANT			
Key concept: As on scope and sequence charts Objective: Pupils will; 1. Identify different types or varieties of bananas 2. Visit demo plots/ go on field trips 3. Be able to carry out the process of planting and measuring holes for bananas Suggested Learning Activities • Field trips • Look at case studies of bananas Suggested Learning Resources • Different varieties of the banana fruit	1. Identify different times of planting bananas 2. State the advantages and disadvantages of planting during those times 3. Identify/select suckers for the nursery • Demonstrations of how to plant a banana plant and sucker selection • List garden tool and state the function of each	1. Identify types of fertilizers suitable for bananas e.g compound C and J 2. Know quantity of fertilizers per station and months of application 3. Identify suckers for succession • Demonstrations of how to apply fertilizers	1. Measure inter row and in row spacing 2. To select succession suckers appropriately • Practicals on the field • Identifying suckers for succession • Measuring sticks (2.1m and 2.4m) • Hoes and shovels
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**
TOPIC 6: MAINTENANCE OF THE BANANA PLANTATION			
Key Concepts: As on Scope and Sequence chart Objectives: Pupils will 1. Identify tools to be used for the maintenance of the banana plot 2. Identify materials to be used for mulching and state the advantages of mulching	1. Identify and list different methods of preventing soil erosion 2. Build windbreaks using grass 3. Identify different types of pests that affect bananas and list the control mechanisms	1. Identify different types of fertilizers that are suitable for bananas 2. Know the time for fertilizer application 3. Identify and list proper tools needed in fertilizer application	1. State the correct handling and storage of chemicals 2. Explain ways of controlling different pests 3. Identify and list different ways of de-suckering

Suggested Learning Activities • Visit to the banana plantations • Actual weeding, watering, slashing and mulching Suggested Learning Resources • Watering cans, sickles and slashers • Material for mulching e.g grass • Plenty of water	• Make a list of different pests and how they affect the banana plant • Identify plants that have been affected by pests and try to identify the pest • Running water • Pest control chemicals	• Practical work in the application of fertilizers, trimming and propping • Compound C and J and banana blend • Y shaped bags • Knives and prop sticks	• List de-suckering tools • Identify different diseases that affect the banana plant • Tools for de-suckering • Pest chemicals
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**
TOPIC 7: HARVESTING AND MARKETING OF THE BANANA FRUIT			
Key concepts: As on scope and sequence diagram Objectives: Pupils will; 1. Identify and list maturity indicators 2. Identify and explain best ways of harvesting 3. Identify and explain traditional and natural methods of ripening bananas Suggested Learning Activities • Field trips • Experiments • Identify ready markets, local and abroad • Identify the signs of ripening Suggested Learning Resources • Bananas • Ripening liquid • Containers and knives	1. Identify hygiene methods to be practiced when processing bananas 2. Identify natural and traditional methods of ripening bananas • Demonstrations on how to apply chemicals for pest control • Resource person • Grading showing natural methods of ripening bananas	1. Identify and list all products made from bananas 2. Identify different storage facilities and possible suitable means for transportation of bananas • Field trips • Demonstrations	1. Be able to calculate profit of total number of bananas after expenditure. • Field trips • Case studies • Calculating profit and loss • Total number of bananas to be harvested