

INTRODUCTION

Environmental Science is a subject that helps learners to understand their environment and how they relate to it. It is a multi-disciplinary subject that brings together Agriculture, Home Economics and Science. The combination of these subjects came about as a result of recommendations of the Revised National Policy on Education (1994) and the subsequent Cream Wright report (1995).

RATIONALE FOR ENVIRONMENTAL SCIENCE

Environmental Science exposes learners to hands on experiences characterized by an inquiry method of learning whereby they study through process skills which include observation, asking questions, investigating, experimenting and recording.

Using the hands on approach, Environmental Science gives learners opportunities to develop basic manipulative and problem solving skills useful to real life situations. Environmental Science provides learners with an understanding and acquisition of basic knowledge of health practices, safety in the environment and the world of work.

Environmental Science plays a central role in the development of the learners by helping them gain an understanding of the scientific and technological aspects of the environment they live in. Awareness and knowledge gained and skills learnt are expected to develop the learners' sense of responsibility towards the environment.

SUBJECT AIMS FOR ENVIRONMENTAL SCIENCE

On completion of the Lower Primary Education (Standard 1 – 4), learners should have:

1. developed desirable attributes such as curiosity, creativity, assertiveness, self- esteem, open mindedness and respect for the environment and for one's own life
2. developed environmental awareness and conservation of its resources

3. developed awareness of the inter-relationship between Science, Technology and Society in everyday life
4. acquired knowledge, skills and appropriate attitudes towards food production
5. acquired critical thinking, problem solving and inquiry skills
6. developed awareness and appreciation of the use of computers in everyday life
7. developed awareness and appreciation of basic entrepreneurial skills
8. developed awareness of their rights and responsibilities related to health, safety and ser

TEACHING METHODOLOGIES

The syllabus encourages a learner-centred approach as emphasized in the Curriculum Blueprint. This approach involves laying emphasis on Science process skills, and the exposure to hands on activities, which should increase the participation and performance of all learners, including those with special needs.

The teacher in this case assumes the role of a facilitator for learning. Teaching and learning activities in class are planned to draw from the experiences of the learner, and provide a conducive classroom atmosphere that allows pupils to be active participants in their own learning.

Teachers may use various teaching methods including problem solving, project method, thematic approach, experimentation, investigation, demonstrations, field excursions and discussions. The local environment should be used to provide context to the syllabus.

Environmental Science must be presented in an interesting and challenging way that should popularise it.

SCIENCE PROCESS SKILLS

The syllabus puts emphasis on scientific skills. These skills are the centre of Environmental Science teaching at this level.

As the learners answer questions or solve problems, they will employ many of these skills. Listed below are the process skills that learners have to acquire. These have been integrated in the various topics of this syllabus.

Observing and recording

Learners should examine the environment using their senses: They should talk about, document and illustrate changes observed and explain given data.

Classifying and comparing

Learners should organise, categorise and even judge organisms or objects using their own criteria

Predicting

Learners should be able to guess or foretell events in the future and verify assumption about observable events.

Measuring and comparing

Learners should be able to categorise and compute various measures using non standard and standard units.

Investigating

Learners should be able to examine and test the events and relationships in the environment

ORGANIZATION OF THE SYLLABUS

The syllabus is organized into the following modules;

Module 1: Our Surroundings

Module 2: The non living environment

Module 3: The living environment

Module 4: Health and Safety

ATTAINMENT TARGETS

At the end of the four years of Primary Education, learners should be able to;

1. demonstrate basic manipulative skills when using basic garden and household equipment
2. apply basic problem solving skills for use in their everyday lives
3. demonstrate science process skills and be able to apply them
4. acquire basic concepts about living and non-living things
5. recognise the effect of basic health practices
6. demonstrate safety measures on the road, at home and school environment and the use of first aid.
7. Describe the interaction among science, technology and society (Transport, communication, food production, health, etc.)
8. Show awareness and appreciation of the use of computers in everyday life
9. Demonstrate desirable attitudes towards the environment

STANDARD ONE

MODULE 1: OUR SURROUNDINGS		
<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
1.1 Living and Non Living things	1.1.1 Observe the surroundings	1.1.1.1 observe characteristics of objects, organisms and events in the environment using their senses 1.1.1.2 record observations using simple drawings 1.1.1.3 classify objects in the surrounding using own criteria
	1.1.2 Compare living and non-living things	1.1.2.1 sort objects by different characteristics 1.1.2.2 classify things into living and non-living things 1.1.2.3 state the characteristics of living and non-living things 1.1.2.4 classify organisms into groups of things that are the same
1.2 Care of the surroundings	1.2.1 Demonstrate proper care of the surroundings	1.2.1.1 observe the state of cleanliness of the school 1.2.1.2 describe a clean environment 1.2.1.3 discuss the need to have a clean environment
MODULE 2: THE NON LIVING ENVIRONMENT		
<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
2.1 Sky, seasons and weather	2.1.1 Observe bodies in the sky	2.1.1.1 identify objects in the sky 2.1.1.2 recognise that the sun gives light and heat 2.1.1.3 recognise that sunrise and sunset initiate day and night, respectively 2.1.1.4 recognise that the stars give light at night
	2.1.2 Observe and record weather conditions	2.1.2.1 identify conditions as hot, warm and cold 2.1.2.2 observe weather conditions 2.1.2.3 describe a sunny, cloudy, windy and rainy day 2.1.2.4 draw pictures to show a sunny, cloudy, windy and rainy day 2.1.2.5 identify appropriate clothing for different weather conditions
2.2 Natural Resources	2.2.1 Identify sources and uses of water	2.2.1.1 identify sources of water 2.2.1.2 observe water from different sources 2.2.1.3 state the uses of water at home 2.2.1.4 demonstrate the uses of water at home 2.2.1.5 appreciate that water is a limited resource and should not be wasted

	2.2.2 Investigate properties of rocks and soil	2.2.2.1 identify rocks and stones according to the following attributes (size, shape, texture, colour) 2.2.2.2 state uses of rocks and stones 2.2.2.3 observe different types of soil in the locality 2.2.2.4 state uses of soil 2.2.2.5 use different soils to make models
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MODULE 3: THE LIVING ENVIRONMENT

<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
3.1 Observing plants	3.1.1 Observe features of plants	3.1.1.1 observe features which plants possess 3.1.1.2 record observations using simple drawings 3.1.1.3 classify plants using own criteria 3.1.1.4 compare same parts of different plants 3.1.1.5 measure plant parts using non-standard units 3.1.1.6 identify common plants 3.1.1.7 collect and display leaves and fruits of common plants in the locality 3.1.1.8 name harmful plants
3.2 Ourselves and other animals	3.2.1 observe features of animals	3.2.1.1 name the sense organs 3.2.1.2 state the functions of the five sense organs 3.2.1.3 identify similarities and differences in animal features 3.2.1.4 record observations using simple drawings and models 3.2.1.5 group animals using own criteria 3.2.1.6 compare human beings with other animals 3.2.1.7 identify and name common animals 3.2.1.8 measure each other's height using non-standard units

MODULE 4: HEALTH AND SAFETY		
<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
4.1 Personal Hygiene	4.1.1 practice proper personal hygiene	4.1.1.1 identify ways in which germs may enter the body 4.1.1.2 identify materials used for keeping the body clean 4.1.1.3 demonstrate proper brushing of teeth 4.1.1.4 demonstrate proper hand washing 4.1.1.5 demonstrate proper washing of the body 4.1.1.6 practise a daily routine to keep the different parts of the body clean 4.1.1.7 discuss the importance of keeping clothing clean 4.1.1.8 list places where germs are commonly found
4.2 Safety	4.2.1 Demonstrate personal safety	4.2.1.1 recognise surroundings, strangers and areas of danger or risk 4.2.1.2 demonstrate safety precautions relating to dangerous areas in the surrounding 4.2.1.3 practise proper handling and storing of tools with sharp edges 4.2.1.4 model how to safely cross a road 4.2.1.5 discuss the dangers of placing objects in the mouth, nose, ears and eyes 4.2.1.6 name poisonous substances 4.2.1.7 state safety precautions relating to poisonous substances 4.2.1.8 recognise symbols showing poisonous substances and dangerous situations. 4.2.1.9 recognise dangers of playing in or near water 4.2.1.10 discuss the dangers of fire 4.2.1.11 observe safety precautions when using fire 4.2.1.12 identify service providers in the community 4.2.1.13 discuss how to respond to emergency situations

4.3 Food and Nutrition	4.3.1 Identify different types of foods	4.3.1.1 make a display of different types of local foods 4.3.1.2 classify food using own criteria 4.3.1.3 select foods that can be prepared in various ways 4.3.1.4 compare appearance, smell, taste and texture of different foods
	4.3.2 observe proper eating habits	4.3.2.1 recognise why the body uses food 4.3.2.2 identify ways of eating properly 4.3.2.3 display proper manners when eating 4.3.2.4 explain importance of eating breakfast 4.3.2.5 discuss the dangers of eating spoilt food

STANDARD TWO

MODULE 1: OUR SURROUNDINGS		
<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
1.1 Living and non-living things	1.1.1 Observe living and non-living things in their surroundings	1.1.1.1 identify non-living things 1.1.1.2 identify living things 1.1.1.3 describe the interaction between living and non-living things
1.2 Care of the surroundings	1.2.1 Keep their surroundings clean	1.2.1.1 state the importance of using a toilet to dispose of human waste 1.2.1.2 demonstrate the cleaning of a toilet 1.2.1.3 state at least three ways of proper waste disposal 1.2.1.4 demonstrate at least three ways of proper waste disposal 1.2.1.5 sort waste using own criteria 1.2.1.6 discuss the possible dangers of waste
MODULE 2: THE NON LIVING ENVIRONMENT		
<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
2.1 Sky, seasons and weather	2.1.1 Observe and record weather conditions	2.1.1.1 observe and describe weather conditions 2.1.1.2 record daily weather conditions throughout the year using symbols e.g. temperature, wind and rainfall) 2.1.1.3 observe and make conclusions on changes in weather conditions 2.1.1.4 identify the directions East, West, North and South

2.2 Natural Resources	2.2.1 Keep water safe	2.2.1.1 distinguish water from other clear liquids (paraffin, oil, gin) 2.2.1.2 describe ways of saving water 2.2.1.3 state ways of storing water 2.2.1.4 describe ways that can make water dirty 2.2.1.5 state ways in which water can be dangerous
	2.2.2 Investigate properties of different soil types	2.2.2.1 demonstrate that soil comes from rocks 2.2.2.2 compare texture, particle size and colour of different soils 2.2.2.3 state characteristics of different types of soil

MODULE 3: THE LIVING ENVIRONMENT

<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
3.1 Uses of plants	3.1.1 Investigate uses of plants	3.1.1.1 identify parts of a plant 3.1.1.2 describe functions of parts of a plant 3.1.1.3 preserve some leaves of different plants to make a display 3.1.1.4 make household items using plant leaves, roots, bark, seeds and fruits of plants 3.1.1.5 make leaf and bark prints, rubbings and tracings 3.1.1.6 classify fruits as edible and non edible 3.1.1.7 state uses of plants
3.2 Ourselves and other animals	3.2.1 Acquire knowledge on different body parts and their functions	3.2.1.1. identify and name external parts of a named animal 3.2.1.2. draw an animal and label at least four external parts 3.2.1.3. state the functions of external parts of the body of an animal 3.2.1.4. identify major parts that make up a human body 3.2.1.5. explain relationship between parts that make up an animal body

MODULE 4: HEALTH AND SAFETY		
<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
4.1 Personal hygiene	4.1.1 demonstrate proper care of the body	4.1.1.1 explain the importance of taking care of hair, teeth, feet and nails 4.1.1.2 identify items needed for the care of hair teeth, feet and nails 4.1.1.3 demonstrate proper care of hair, teeth, feet and nails 4.1.1.4 demonstrate care of the eyes, ears and nose 4.1.1.5 investigate how diseases are spread 4.1.1.6 list diseases related to lack of body cleanliness 4.1.1.7 demonstrate ways that can help prevent illnesses e.g. hygiene, immunisations 4.1.1.8 list a variety of childhood illnesses
4.2 Safety	4.2.1 Describe potential hazards and safety procedures	4.2.1.1 explain the need for safety rules at home, school and playground 4.2.1.2 observe common road signs 4.2.1.3 interpret meanings of common road signs 4.2.1.4 classify road signs and markings using own criteria 4.2.1.5 demonstrate how to use and cross the road safely 4.2.1.6 state the safety precautions for a pedestrian and a cyclist when using the road 4.2.1.7 identify basic safety rules when in or near water. 4.2.1.8 predict consequences of unsafe behaviour
4.3 Food and Nutrition	4.3.1 Demonstrate proper methods of preparing, preserving and storing food	4.3.1.1 identify different ways of preparing food 4.3.1.2 prepare a simple snack 4.3.1.3 discuss ways of preventing food contamination 4.3.1.4 demonstrate proper handling of food 4.3.1.5 list different methods of preserving food 4.3.1.6 demonstrate at least one method of preserving food 4.3.1.7 investigate ways of storing food

STANDARD THREE

MODULE 1: OUR SURROUNDINGS		
<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
1.1 Care of the surroundings	1.1.1 demonstrate proper methods of managing waste	1.1.1.1 describe the terms re-use, reduce and recycling 1.1.1.2 identify materials that can be re-used, reduced and recycled 1.1.1.3 describe how waste can be reduced 1.1.1.4 demonstrate how materials can be re-used and reduced
MODULE 2: THE NON LIVING ENVIRONMENT		
<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
2.1 Sky, seasons and weather	2.1.1 Observe weather patterns and their effect on the environment	2.1.1.1 name the four seasons i.e. summer, autumn, winter and spring 2.1.1.2 describe each season 2.1.1.3 perform activities related to each season 2.1.1.4 relate weather conditions to the four seasons
	2.1.2 determine and record changes in weather conditions	2.1.2.1 recognise that wind is air in motion 2.1.2.2 demonstrate that wind has direction 2.1.2.3 find ways of determining wind direction 2.1.2.4 name the instrument used for finding the direction of wind 2.1.2.5 construct a simple wind vane 2.1.2.6 use a wind vane to determine wind direction 2.1.2.7 record daily weather conditions 2.1.2.8 describe the effects of wind on the environment
	2.1.3 Observe shadows formed by light from the Sun.	2.1.3.1 recognise that when light is obstructed, shadows form 2.1.3.2 investigate how shadows change in size in relation to the position of the sun 2.1.3.3 use the size and cast of the shadow to estimate time 2.1.3.4 observe that the moon is visible on some nights and sometimes in the day 2.1.3.5 observe that the shape and size of the moon changes

2.2 Natural Resources	2.2.1 Demonstrate proper care of water	2.2.1.1 describe ways in which water can be polluted 2.2.1.2 describe ways of disposing of dirty water 2.2.1.3 make a soak pit 2.2.1.4 list ways of preventing water pollution 2.2.1.5 investigate common water-borne diseases in the community 2.2.1.6 describe symptoms of malaria and bilharzia (schistosomiasis)
	2.2.2 Demonstrate proper methods of conserving soil	2.2.2.1 investigate the effects of running water and wind on soil 2.2.2.2 describe effects of running water and wind on soil 2.2.2.3 describe causes of soil erosion 2.2.2.4 state the effects of soil erosion on the environment 2.2.2.5 demonstrate conservation of soil

MODULE 3: THE LIVING ENVIRONMENT

<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
3.1 Growing plants	3.1.1 Observe plant growth	3.1.1.1 observe characteristics of different seeds (size, colour, texture) 3.1.1.2 record differences between dry and soaked seeds 3.1.1.3 observe the period of time taken by different seeds to germinate 3.1.1.4 compare the effect of light and darkness on sprouting seeds and seedlings 3.1.1.5 identify and name at least three vegetables 3.1.1.6 plant and observe a vegetable 3.1.1.7 measure vegetable growth in centimetres
3.2 Ourselves and other animals	3.2.1 Investigate importance of animals and their habitats	3.2.1.1 discuss the importance of domestic and wild animals 3.2.1.2 identify different animals 3.2.1.3 identify habitats for different animals 3.2.1.4 describe how animals can be destructive

MODULE 4: HEALTH AND SAFETY		
<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
4.1 Personal Hygiene	4.1.1 practice healthy habits	4.1.1.1 demonstrate proper grooming 4.1.1.2 investigate causes of tooth decay 4.1.1.3 describe the effects of tooth decay 4.1.1.4 discuss ways of preventing tooth decay 4.1.1.5 discuss the effects of substance abuse
4.2 Safety	4.2.1 Demonstrate safety procedures on the road and at home	4.2.1.1 observe road signs and markings 4.2.1.2 identify warning signs 4.2.1.3 list at least four examples of protective clothing 4.2.1.4 explain the importance of protective clothing 4.2.1.5 name departments and personnel that ensure safety 4.2.1.6 identify hazardous household equipment, materials and substances 4.2.1.7 demonstrate proper handling of hazardous household equipment, materials and substances 4.2.1.8 demonstrate proper storage of hazardous household equipment, materials and substances
4.3 Food and Nutrition	4.3.1 Classify foods	4.3.1.1. classify foods according to their sources (plants and animals) 4.3.1.2. group foods according to their function in the body
	4.3.2 Demonstrate healthy eating habits	4.3.2.1 find out the kinds of foods eaten at different times of the day 4.3.2.2 describe meals of the day 4.3.2.3 plan a meal 4.3.2.4 list foods that are suitable for different meals of the day 4.3.2.5 describe unhealthy eating habits 4.3.2.6 demonstrate healthy eating habits

STANDARD FOUR

MODULE 1: OUR SURROUNDINGS		
<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
1.1 Care of surroundings	1.1.1 Demonstrate managing waste in the surrounding	1.1.1.1 discuss the impact of waste in the surrounding 1.1.1.2 describe a land fill 1.1.1.3 describe how land fills and dumping site are used to manage waste 1.1.1.4 use waste materials to make a household item 1.1.1.5 plan and carry out a campaign to manage waste in the locality
MODULE 2: THE NON LIVING ENVIRONMENT		
<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
2.1 Sky, seasons and weather	2.1.1 Measure and record rainfall amount	2.1.1.1 identify instrument used for measuring rainfall 2.1.1.2 construct a simple rain gauge 2.1.1.3 use the rain gauge to measure rainfall 2.1.1.4 describe the effects of rain on the environment
	2.1.2 Identify planets in the universe	2.1.2.1 name planets of the universe 2.1.2.2 list planets in the order of the distance from the sun
2.2 Natural Resources	2.2.1 Demonstrate ways of making water safe to drink	2.2.1.1 explain why water may be unsafe to drink 2.2.1.2 describe ways of making water safe to drink 2.2.1.3 demonstrate simple purification of water 2.2.1.4 demonstrate individual responsibility in using water
	2.2.2 Investigate properties of soil	2.2.2.1 investigate soil to find its constituents 2.2.2.2 determine suitability for plant growth of different types of soils
	2.2.3 Investigate sources of energy	2.2.3.1 identify various types of energy sources e.g. fuels, sun, wind 2.2.3.2 discuss common sources of energy used at different areas in Botswana i.e. lands, cattlepost, villages and cities. 2.2.3.3 Investigate why a certain fuel is the most common in your area. 2.2.3.3 demonstrate methods of conserving energy

MODULE 3: THE LIVING ENVIRONMENT		
<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
3.1 Growing plants	3.1.1 Manage plant growth	3.1.1.1 describe how vegetation conserves soil 3.1.1.2 predict the result of indiscriminately cutting down of trees 3.1.1.3 plant and observe a field crop 3.1.1.4 investigate the requirements for plant growth 3.1.1.5 name pests of the field crop grown 3.1.1.6 describe how pests destroy crops 3.1.1.7 describe ways of protecting crops against pests
3.2 Ourselves and other animals	3.2.1 Observe characteristics of insects	3.2.1.1 list at least three characteristics of an insect 3.2.1.2 identify parts of an insect
	3.2.2 Acquire knowledge on conservation of animals	3.2.2.1 identify traditional and modern ways of conserving animals 3.2.2.2 name the endangered species in Botswana

MODULE 4: HEALTH AND SAFETY		
<i>Topics</i>	<i>General Objectives</i>	<i>Specific Objectives</i>
	<i>Students should be able to:</i>	<i>Students should be able to</i>
4.1 Personal Hygiene	4.1.1 Acquire knowledge on diseases	4.1.1.1 identify ways people can avoid coming in contact with blood 4.1.1.2 list reasons to avoid coming into contact with blood 4.1.1.3 describe procedures to follow in the event of a blood spill 4.1.1.4 name common sexually transmitted diseases 4.1.1.5 discuss ways in which HIV/AIDS and sexually transmitted diseases are spread 4.1.1.6 describe how HIV/AIDS and sexually transmitted diseases can be prevented 4.1.1.7 describe how HIV/AIDS and sexually transmitted diseases affect the body of an infected individual.
4.2 Safety	4.2.1 Match safety procedures to potential hazards	4.2.1.1 state common accidents in the home and school 4.2.1.2 discuss how accidents in the home and school can be prevented 4.2.1.3 describe First Aid procedures for different common accidents in the home and school 4.2.1.4 demonstrate how to handle accident victims with care to avoid HIV infection 4.2.1.5 describe at least three examples of each of warning, regulatory and information signs 4.2.1.6 observe road signs in the locality 4.2.1.7 discuss the causes of road accidents 4.2.1.8 discuss the effects of road accidents 4.2.1.9 discuss ways of preventing road accidents
4.3 Food and Nutrition	4.3.1 Compare eating habits with a balanced diet	4.3.1.1 identify nutrient groups and their key functions i.e. fats, proteins, carbohydrates, vitamins, minerals and water 4.3.1.2 name foods rich in each nutrient 4.3.1.3 plan a balanced meal using local foods 4.3.1.4 record daily food intake and determine if it is balanced 4.3.1.5 demonstrate different methods of cooking 4.3.1.6 explain reasons for cooking 4.3.1.7 prepare a simple breakfast using a variety of cooking methods