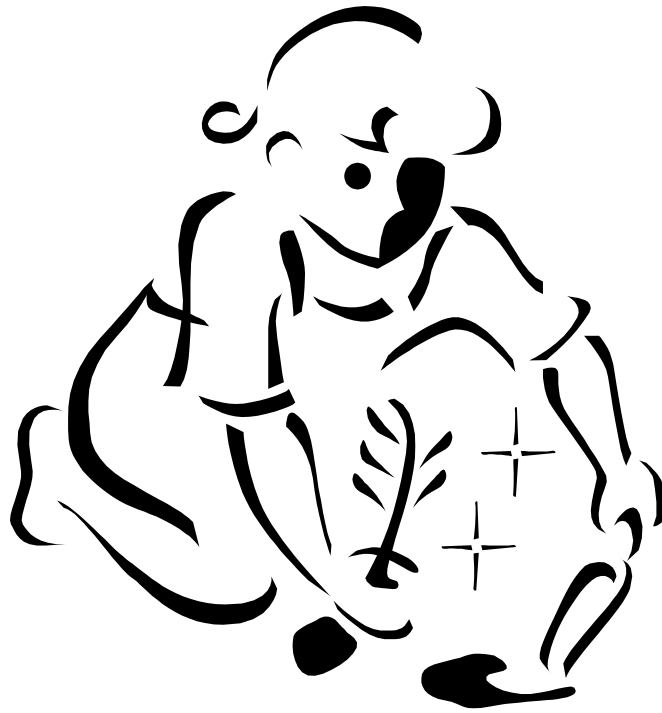


CATEGORY 2

GREENING YOUR SCHOOL



CATEGORY 2: GREENING YOUR SCHOOL

Overall Objective: To create pleasant school environments, and to promote respect for nature and care of living things.

Trees, shrubs, gardens and natural green areas all help to create a pleasant and healthy environment for learning and recreation. They provide essential food and shelter (habitat) for insects, birds and other animals.

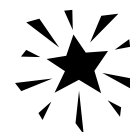
Trees and other plants can also help to foster education about the environment.

Trees can reduce heat in buildings by providing shade. They maintain the water cycle, maintain atmospheric balance and prevent soil erosion.

Students should learn the value of trees and other plants to man and the environment as well as the importance of proper farming practices.



SCHOOLS MUST DO AT LEAST ONE ACTIVITY FROM THIS CATEGORY



CASE STUDY: SLIGOVILLE ALL AGE

Sligoville All Age has a student population of about 300 and the school has a small farm. Many of the students come from farming families and have seen their parents struggle with high prices for chemicals and low prices of produce. Through the organic farm, students have shared a more cost-effective way of farming with their families.

Students built their own compost heap to produce a rich fertilizer, which is added to the soil.

Many families in Sligoville now have compost heaps as well. Students have also learned about inter-cropping and companion plants to keep away pests.

Before being involved in an environmental programme, there was low student attendance at school, particularly on Fridays. However, attendance improved as students looked forward to seeing how their crops were growing and spending part of their day learning outside of the classroom.

ACTIVITY: TREE NURSERY

Objectives:

Students will:

1. Explain why trees are important
2. Plant trees either at school or in the community.

A good place to start is with a tree nursery, followed by a tree-planting project. The first step is to learn about trees:

- What are the functions of trees in nature?
- How do people use trees?
- What are some of the most common trees that grow in Jamaica and what trees grown in or near the school yard? (use common names and Latin names)

The next step is to consider what will happen to the young trees that grow in your tree nursery:

- Will they be planted on the school property, in an area of the community, or at each child's home?
- Will the seedlings be sold as part of a fundraising project?



COLLECTING TREE SEEDS

Ask students to save seeds from the fruits that they eat both at home and at school. Each child is required to grow a baby tree. Seeds that grow easily are Ackee, Otaheiti Apple, Guava, Tamarind, Naseberry, Avocado Pear and Mango (common mango).

COLLECTING CONTAINERS FOR SEEDS

Collect USED box juice containers, plastic cups or plastic bottles (with the tops cut off) for planting the seedlings. This could be part of your recycle/reuse programme. To prepare the container:

- Make three or four small holes in the bottom of each container (to help with drainage).
- Label each container with the type of seed planted, the date and the
- Student's name. This student is to be responsible for the watering and caring of this baby tree.

PLANTING THE SEEDS

Designate a morning lesson (perhaps Science class) for each class to plant their seeds.

- Put some gravel or small stones in the containers already labeled.
- Fill with a mixture of dirt, sand and/or compost.
- Plant one seed in each container, about the same distance under the earth as the diameter of the seed.
- Water

CARING FOR THE YOUNG TREES

An area for the storage of the young trees should be identified. The area should be:

- **Cool but well lit; e.g. under a big tree is a good place. The young trees will need some sunlight but should not be baked in the direct sun.**
- **Well protected from livestock**
- **Close to a water supply**

Watering should usually be done once every three days.

To decide if the seeding needs water, feel the soil. If it is hard and dry, it needs water; if it is soft and moist, it does not need water.

When seedlings get to 12-20 inches in height or stems get to 3/4 inch thick, they should be transplanted.

PROTECTING THE BABY TREES

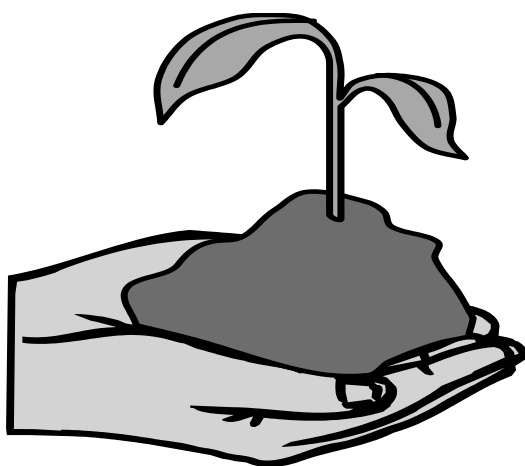
Baby trees need to be protected from goats and playing children. Build a platform to raise them off the ground or a strong fence around them.

PLANTING OR SELLING YOUNG TREES

At the end of the project, you should have quite a lot of baby trees. When they have become strong little tree seedlings, you may choose to plant some of them around your school to provide fruit or shade. You may also ask students to take their baby trees home to plant in their back yard, or you may plant them in the community, or sell them as a fund-raising project.

BACKGROUND INFORMATION LINKS

- ∞ **Trees—Trees are our friends**
- ∞ **Forest Connections: The forest in your classroom**
- ∞ **Notes on the natural history of Jamaica**
- ∞ **Neem—A tree for sustainable development**



ADDITIONAL TIPS ON TREE PLANTING

SEEDS

- Seeds should be cleaned and planted as soon as possible after collecting
- very hard seeds (those that cannot be crushed by hand) should be soaked in cold water for 24 hours before being sowed. Some species may require a small hole in the seed coat (just a little 'nick') to allow them to grow.
- some trees can be grown by direct seeding, where the seeds are planted directly where the trees are needed. Seeds should be soaked and the ground worked in advance. Seeds should be planted by hand, covered lightly with soil and mulched with grass. Mark the spots where the trees are planted.

GROWING SEEDS FROM CUTTINGS

- this is done by cutting sticks or branches and planting these in the desired spot.
- branches 2cm in diameter of 2nd year growth of the parent tree can be cut at 30 cm lengths and planted at a slight angle, with 2/3 of their length in the soil. Top ends should be cut diagonally.
- trees such as immortelle, quickstick and breadfruit can be planted in this manner.

PLANTING FROM CONTAINER STOCKS (seedlings in bags or boxes)

- any roots which have gone through the bag or box should be carefully cut with sharp knife or scissors when lifted out of container for planting.
- if seedlings start to wilt, the leaves should be pruned by removing 50-80% of the leaves with sharp scissors or shears - be careful to leave the terminal bud (base of leaf) intact.

PLANTING THE SEEDLINGS

- the ground should be prepared as new seedlings will compete for light, water and nutrients. Plant seedlings on 3'x3' area that has already been cleared of weeds and ploughed.
- dig a pit in the center of this (12" wide by 15" deep) just before planting to prevent drying of the soil.
- the bottom of the pit should have loose soil and then the seedling with roots and soil intact should be carefully placed in the hole, loose soil filled around the seedling and pressed tight.

This activity can be infused into the following area of the ROSE curriculum

Grade 7 Science

Unit 3: Living Things and How They Reproduce

3.5 Seed Structure and Germination

Specific objectives

Students should be able to:

5 Perform experiments to determine the conditions necessary for a seed to germinate and grow into a seedling

6 Record observations of germinating seed each day after planting

7 Measure the seedlings growing under different conditions and compare their growth

Suggested student activity (Page 46)

2a Plan and design an experiment to find out the conditions necessary for germination

3 Have students set up an activity to observe the germination and growth of a seed over a one week period

ACTIVITY: ORGANIC GARDENING AND COMPOST HEAP

Objectives:

Students will:

1. Define the concept 'organic gardening'
2. Explain the harmful effects of synthetic pesticides and fertilizers
3. Carry out an on-the-ground activity, to provide income for the school or nutritious produce for school lunches

Begin discussion with students on the principles of organic gardening, that is:

- **gardening/farming without synthetic fertilizers, insecticides or herbicides.**

Organic gardeners believe that a balanced soil ecosystem will produce healthy plants with few pest or disease problems. Some ways to build healthy soil include:

- **adding composted earth and animal manures**
- **using mulch around plants**
- **adding nitrogen fixing plants such as legumes (red peas, gungo peas)**
- **rotating crops**
- **using liquid fertilizers (from plants, fish, seaweed)**

Organic gardeners control pests or plant diseases without synthetic or harmful chemical insecticides or herbicides. They do this through crop rotation, companion planting, polyculture (planting different crops close together so that no pest or disease can wipe out everything at once), integrated pest management and the use of sprays made from garlic, peppers or pyrethrum (a plant) or insecticidal soap.

GUIDELINES FOR AN ORGANIC GARDEN

Discuss with your students where the garden will be and what you will plant:

- **Ask the students to interview family and community members about ways to grow gardens and what vegetables or flowers grow well in your area.**
- **Decide what you will plant**

PREPARE THE SOIL

When you decide where the garden will be, prepare the soil:

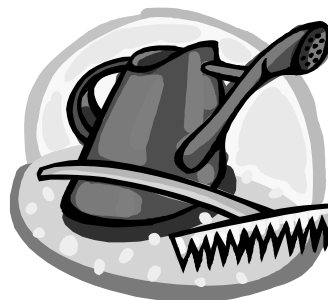
- **Using a hoe or a rake, the soil must be loosened and turned over.**
- **Make sure that rocks, grass and weeds are removed**
- **Work the soil with tools or hands, to a depth of 5-6 inches, so that it is crumbly and without hard lumps.**

A good way to prepare the garden plot is to pile the soil into rows of small ridges and valleys.

PLANT THE SEEDS.

Plant the seeds in rows along the tops of the ridges about an inch below the surface:

- **Scatter the seeds thinly so that they are not too close together.**
- **Water the seeds promptly.**
- **Mark each row with the name of the seeds planted in it.**



Category 2: Greening your school

This activity is not limited to the use of seeds. Other methods can also be used. For example, some plants can be reproduced using leaves and cut stems.

CARING FOR THE GARDEN

Watch the small shoots and leaves as they begin to grow. Water and weed your seed rows frequently. If the seeds are too close together the extra ones can be "thinned out". The students will need to learn to distinguish the seedlings from weeds.

DEALING WITH PESTS

Have students make written observations of what happens in the garden:

- **Encourage them to remove visible pests (e.g. caterpillars) by hand**
- **Have students investigate what plants repel insects.**
- **Have students learn about and make organic pesticides.**

INTEGRATED PEST MANAGEMENT

Gardeners can control pests or plant diseases through Integrated Pest Management (IPM). IPM is a method of managing pests that utilizes least toxic methods. It identifies and eliminates the source of pest problems rather than treating the symptoms (e.g. spraying). This involves careful monitoring of the area and using knowledge of natural predators to provide the type of garden which is relatively free from pests. (see background information). It should be noted that IPM is not necessarily a totally non-chemical approach, but generally

results in a reduction in the use of toxic chemicals.

IPM can be described in the following 4 (four) steps:

1. **Inspect:**

Take a look at the insects/weeds in your garden. Study their habits and life cycles, and do research on them so that you can determine the best course of action.

2. **Monitor:**

Keep examining plants and establish when the number of insects is intolerable.

3. **Determine Treatment:**

Begin with the least toxic methods first. Select and time the treatments to be most effective and least disruptive to human health and the environment.

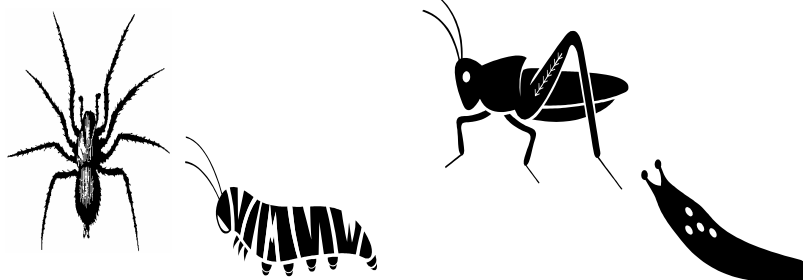
4. **Evaluate:**

Determine how successful the IPM programme has been

Source: Blueprint for a green school

RECORDS

Recording what is grown in the garden is very important, because you may have to reap your produce before judging. Make sure students keep accurate records of vegetables reaped and sold.



Category 2: Greening your school

HARVEST THE GARDEN

Students will need to learn what the fully grown flower, fruit or vegetable looks like, when it should be harvested, and how best to pick and store it. You will need to discuss with your students what to do with the flowers or vegetables you grow. Some of the produce might be used for school lunches, a school or local community event, sent home with students, or sold during a fund-raising activity.

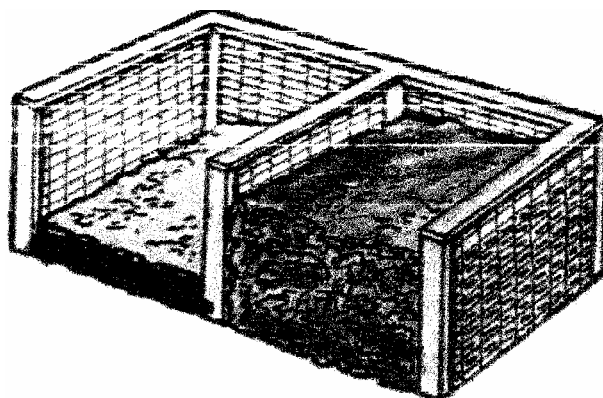
USING A COMPOST HEAP

Vegetable and fruit waste from the school and from home, as well as garden clippings and cuttings, can be used to build a compost heap. You will need the cooperation of canteen and ground staff. Students are amazed to see garbage turn into a rich crumbly earth after about three months. Have students document the

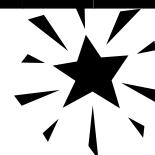
different steps in the rotting process and the importance of soil organisms to the healthy growth of plants.

BACKGROUND INFORMATION LINKS

- ∞ **How does a leaf turn to soil?**
- ∞ **Herbs and their insect repellent properties**
- ∞ **Neem –A tree for sustainable development**
- ∞ **Booklet: Organic Gardening For Schools**
- ∞ **Forest Connections: The forest in your classroom (Composting at school and at home)**



**HAVING A COMPOST HEAP IS ESSENTIAL TO
HAVING A SUCCESSFUL ORGANIC GARDEN**



This activity can be infused into the following areas of the ROSE curriculum

Grade 7 Science

Unit 3: Living things and how they reproduce

3.4 Reproduction without seeds

Specific objectives

Students should be able to:

2 Describe some ways in which new plants can be grown without seeds

3 Perform a simple activity to illustrate reproduction without seeds

Suggested student activities (Pages 43-44)

1 Have students grow new plants from a variety of plant parts (e.g. pieces of leaves and cut stems) and write a report on the experiment.

2 Encourage students to transfer the young plants to the school garden and to water them as they grow

Grade 8 Resource and Technology

Module: Agriculture and the Environment

General objective 4 Protecting and conserving resources in the environment

4.1 (Page 54)

Topics/Content outline

B Methods of plant protection

(i) Biological (ii) chemical

Expected outcomes and skills

Students should:

-Understand the importance of crop rotation and the use of resistant varieties in pest and disease control

-Know some common plants used in biological control of pests

-Appreciate the importance of biological control of pests and diseases

Suggested activities

-Identify and collect insects

-Practice mulching and crop rotation

ACTIVITY: DESIGN AND ORGANIZE NATURE WALKS

Objectives:

Students will:

1. Describe plants and animals around them
2. Display behaviour which demonstrates respect for nature
3. Explain the interconnections between living things.

Have students take their notebooks and lead the nature walk on the school grounds or to a nearby habitat. You could start with a map of the school, showing all the trees and shrubbery. Have students note where animals are found as well, including insects, birds, butterflies, lizards, stray animals, etc.

Students could

- collect leaves and grasses and take them back to the classroom for identification.
- name trees, describe the value of each tree, and observe what kind of animals live there.
- take along piece of string and lay it on the ground in a natural way. Have students count the number of different types of plants and animals which appear along the length of the string. Pick samples of the plants and make posters of them.

Ask students to write down how all the different plants and animals interconnect. For instance:

- What do the birds eat? The ants?
- Does grass grow better under the trees or in the open sun? If so, why?

Have students pick one of the plants or animals they see on the nature walk and do a class project on it.

Encourage students to find pleasure in being outside. Help them to observe and describe what they see. Ask them to notice how they feel, how pleasant it is under a tree compared to inside a building. Ask them to notice how they feel on a sunny day versus a rainy day.

The school can also make a permanent area of the school a nature walk or garden.

BACKGROUND INFORMATION LINKS

- ∞ Biodiversity detective activity
- ∞ Backyard naturalist
- ∞ Everything in life is connected
- ∞ Forest Connections: The forest in your classroom. (The web of life game)
- ∞ Everything is connected (The web of life game)

This activity can be infused into the following areas of the Primary & ROSE curricula

Grade 1

Term 2; Unit 2; Unit title: Things in the Home

Focus question 2: How do I care for the things in my home and use them safely

Objectives

Pupils will:

- ◆ Show by their behaviour that plants and animals should be cared for
- ◆ Preserve the environment while studying it

Procedure/activity (Page 55)

#6 Talk about how they care for the plants and animals at home. Create “big books” about caring for animals and plants (including pictures and sentences). Demonstrate how they care for plants and animals at home by caring for plants and animals in the school environment. Keep a daily record of what they do e.g. “We watered the plant”

Grade 2

Term 3; Unit 3; Unit title: Plants and Animals in My Community

Focus question 3: How do I care for/protect the plants and animals in my community?

Objectives

Pupils will:

- ◆ Write a simple sentences about their own observations
- ◆ Record observations about their home, school and community
- ◆ Preserve the environment while studying it

Procedures/activities (Pages 178-179)

#1 Go on a nature walk to observe plants and animals in their natural environment. Describe what they observed, using illustrations and sentences

#2 Discuss how to care for animals and plants in their natural environment

#7 Talk freely about what would happen if:

- (i) Johnny shot down a bird's nest
- (ii) All the trees, grass and other plants were destroyed in a certain area
- (iii) People consistently killed certain types of animals

#8 In groups plan and design a project on one of the following:

A. Recycling waste B. A plant nursery C. An animal sanctuary

Grade 3

Term 3, unit 1, Unit title: Living and Non-Living Things

Focus question 1: How can I tell if something in my environment is living?

Objectives

Pupils will:

- ◆ Differentiate between living and non-living things
- ◆ Observe changes that occur in a seed as it germinates over a period of time
- ◆ Use pictures or three-dimensional forms to depict people, animals, plants, faces observed in the environment

Procedure/activity (Page 274)

#5 In groups enclose a selected area of schoolyard. Do tally of the different animals and plants found in the area and represent this in a pictograph/bar graph. Select 3 pea or corn seeds. Place them in a container with moistened paper. Record the changes in the seeds over the next 10-14 days and represent the initial and final states using visual/graphic means (e.g. labelled diagram).

Focus question 4: In what ways are non-living things and living things interdependent?

Objective

Pupils will:

- ◆ Cut, tear, paste, fold, join, draw, pain, label, assemble using a variety of materials, to create two and three dimensional images representing relationships

Procedures/activities (Page 279)

#2 Do observations of living and non-living things in the home and schoolyard and conduct research (using interviews, picture collection etc) to compile information on how living things depend on living &/or non-living things. Report on findings, including specific ways named living things depend on living &/or non-living things e.g. caterpillar-vegetable leaves or lignum vitae leaves

#3 Create a story, aesthetic piece or performance piece, to express their ideas on how their lives would be affected if named living and non-living things were removed from the environment

Grade 5 Language Arts

Term 3; Unit 1; Unit title: Exploring Our Country

Focus Question 1: What can I say or write about plants and animals in Jamaica?

Objective

Pupils will:

- ◆ Demonstrate language awareness and the conventions in spoken and written language

Procedure/activity (Page 306)

#10 Investigate and report on plant and animal life found around a pond Lake or river in the neighbourhood. Give oral reports to class. Write a report

Grade 7 Science

Unit 2: Grouping things

2.2 Grouping things into living and non-living things

Specific objectives

Students should be able to:

1 Observe living things and list their characteristics

3 I identify ways for caring for living and non-living things in the school environment

Suggested student activities (Page 29)

1 Working in groups of five carefully collect a variety of both living and non-living objects showing due concern for the environment. Each student should make a table to show the living things, non-living things and reasons for grouping

2 Project: Working in groups students should identify and care for a particular part of their school environment for one week and present a group report of what was done. Each group should be responsible for planning the project. Provide each group with a list of activities to be done. E.g. they should keep a record of the living and non-living things in the environment they choose to study. They could also keep a record of the changes that take place in these things and how they were able to care for the environment

Grade 8 Science

Unit 9: Energy Flow Through Living Systems

9.2 Food and Energy Chains and Webs

Specific objectives

Students should be able to:

- 1 State that plants are the ultimate source of energy for animals
- 2 Illustrate examples of food chains and food webs
- 4 Record observations made from field trip activity

Suggested student activities (Page 88)

- 1 Organise a visit to a nearby thriving habitat and have groups of students record observations of a section of the habitat. Students should be asked to comment on: types of animals, types of plants, which types of organisms are numerous, probable reasons for the organisms being numerous, feeding relationships
- 5 Illustrate with diagrams examples of food and energy chains or webs seen in the environment
- 6 Prepare work cards with the following information for groups of students. Each student should make notes on the discussion

REMOVING ORGANISMS FROM THE COMMUNITY

People often change the environment to fit their needs. This can alter the community. What are some possible changes that people could make in the food chain or food web? How do you think this would affect the energy flow? Work with four other persons and discuss the implications of removing any of the organisms from the community. Report on your conclusions

ACTIVITY: PLANTING FLOWERS AND SHRUBS TO BEAUTIFY AREAS OF SCHOOL

Objectives:

Students will:

1. Demonstrate an awareness of and appreciation for beauty in nature
2. Take action to improve their surroundings.

Many school grounds are very unattractive with large, dusty or concrete areas. Have students plan where, and how they are going to plant flowers or shrubs. If there is not enough soil for a proper garden, consider a container garden. Old tyres can be used, or half-drums, or even smaller containers such as paint cans or plastic bottles.

Consider areas where there might be soil erosion. Would plantings help to retain the soil? Khus khus grass is effective in preventing soil erosion. If there is soil erosion, discuss with students why this is happening.

Ask students to draw pictures of how they would like the school to look.

- If the garden is going to be a container garden, decide where it is to be placed and what containers will be used.
- Try to use items available at school which would normally be thrown away.
- Ask students to bring containers from home.



- If the garden is going to use beds, have older children fork up the beds and add compost.
- Seek seedlings or cuttings from parents or nearby plant nurseries
- Have students learn which plants grow from cuttings and which from seeds.
- Students must know the names of plants.

Consider drip irrigation for your flowers:

- Punch small holes in large plastic bottles and hang them over the plantings.
- Put the cover on the plastic bottles and tighten.
- You will find very little water comes out of the holes.
- Have the students loosen the cap once per day and the water will drip out onto the plants.

If you have goats, cows or chickens on your school grounds, you will need to protect plantings.

When the plants grow, ask students how they feel about the school grounds. Compare how the school looks afterwards with the pictures they drew.

BACKGROUND INFORMATION LINKS

- ∞ [How to take environmental action](#)
- ∞ [Backyard naturalist](#)

This activity can be infused into the following areas of the Primary and ROSE curricula

Grade 2

Term 3; Unit 3; Unit title: Plants and Animals In My Community

Focus question 2: How are plants and animals useful?

Objective

Pupils will:

- ◆ Discuss ways in which we depend on plants and animals

Procedure/Activity (Page 177)

#11 Plan to beautify part of the schoolyard by: (a) planting a tree (b) making a flower garden (c) planting grass in a dusty area

Grade 7 Resource and Technology

Module: Agriculture and the Environment

General objective 3 Identifying and harnessing non-human resources for the improvement of the quality of life

3.2 (Page 43)

Topics/Content outline

C Plants

-Classification of plants

- flowering and non-flowering
- monocotyledonous and dicotyledonous

Expected outcomes and skills

Students should:

- Be able to classify plants as flowering and non-flowering
- Understand the concepts involved in classifying flowering plants into monocotyledonous and dicotyledonous

Suggested activities

-Plant collection

-Seed collection

-Show growth and movement in plants

-Show difference in germination of monocotyledonous and dicotyledonous seeds

ACTIVITY: PROJECT ON THE IMPORTANCE AND PROCESSES OF MAINTAINING FERTILE SOILS & THE HAZARDS OF IMPROPER USE OF SYNTHETIC FERTILIZERS AND PESTICIDES IN ALL TYPES OF GARDENING

Objectives:

Students will:

1. Explain why soil fertility is important
2. Explain the dangers of synthetic fertilizers and pesticides
3. Describe the kinds of natural measures that can be put in place to maintain soil fertility

Students can:

- Do research on the composition of healthy soil and the different types of soil.
- Make a model with the different types of soil in containers.
- Learn about the qualities of different types of soil and how they act differently.
- Examine the soil on the school grounds and say what kind of soil it is.

LEARNING OUTCOMES FOR STUDENTS

- What plants need in order to grow and what happens if you grow the same plants on the same piece of land for a long time.
- The necessity for nitrogen, potassium and phosphorous for healthy plant growth.
- Knowledge on terracing and other methods of soil conservation for farmers. Students could build models showing the effects of planting on steep slopes without terracing.

Students should then research the effects of using synthetic fertilizers versus organic fertilizers. What happens when fertilizers run off into water bodies? Research can be done on common agricultural pests and students can learn about the effects of pesticides, such as:

- Insects becoming resistant
- The proper way to handle chemicals, and the harmful effects for agricultural workers of improper handling of pesticides.
- The effects of improper use and disposal of pesticides and their containers, and pesticide run-off on rivers and the sea
- Health hazards involved in eating foods with chemical residues.

Students should experiment with their own natural pesticides (See Booklet, Organic Gardening for Schools) and see how well they work. Students should know the effects of pesticide use on animals such as birds, and their effects on beneficial insects, such as bees and ladybugs.

BACKGROUND INFORMATION LINKS

- ∞ **How does a leaf turn to soil?**
- ∞ **Forest Connections: The forest in your classroom (composting at school and at home; Soil secrets)**

This activity can be infused into the following areas of the ROSE curriculum

Grade 8 Social Studies

Unit 3: Using Our Resources and Related Environmental Matters

Subtopic A Farming

Specific learning outcomes:

Knowledge

Students should be able to:

8 Critically assess farming practices in Jamaica

Attitudes

Students should:

2 Demonstrate commitment to preservation of the physical environment

Content

4 Problems faced by farmers e.g. pests, diseases, disasters, praedial larceny and solutions to the problems

Advanced learning activity (Page 73)

2 Carrying out research on the environmental impact of such agricultural practices as the use of pesticides, burning trash when clearing land, monoculture, introduction of hi-tech methods in agriculture

Grade 8 Resource & Technology

Module: Agriculture and the Environment

General objective 1 Exploring and utilizing resources

Topics/Content outline

1.3 (Page 50)

Soil and its role in agriculture

B Soil composition

-organic

-inorganic

-air, water, soil organisms

C Soil conditions necessary for plant growth

Expected outcomes and skills

Students should:

-Know the importance of soil to agriculture and the environment

-Know the basic components of soil

-Develop an understanding of the soil conditions necessary for optimum plant growth

-Understand the relationship between the size of soil particles and the ability of soil to retain moisture

-Appreciate the importance of humus on soil fertility and plant growth

Suggested activities

-Examine the different soil samples for moisture and particle size

-Examine the composition of soil

-Composting

-Collect and display soil samples

-Collect data and plot graph showing growth rate of plants under different conditions

Grade 9 Resource and Technology

Module: Agriculture and the Environment

General objective 1 Understanding the structure and classification of resources

1.1 (Page 59)

Topic/Content outline

B Major components of soil:

Soil composition—water, air, organic and inorganic matter

Expected outcomes and skills

Students should:

- Understand the major components of soil and the effect on soil fertility

Suggested activity

- Response of crops to different combinations of fertilizers
- Collecting samples
- Analysing samples

1.2 (Page 60)

Topics/Content outline

Methods of maintaining soil fertility-fertilizer, mulch, green manure, legumes, crop rotation, erosion control

Expected outcomes and skills

Students should:

- Differentiate between organic and inorganic fertilizer and soil amendments
- Appreciate the importance of mulch in maintaining soil fertility
- Understand the importance of green manures and legumes in maintaining soil fertility
- Understand the importance of crop rotation in maintaining soil fertility and the factors which influence the sequence of rotation
- list the effects of using organic versus inorganic fertilizers

Suggested activities

- Compare the effects of organic and inorganic fertilizers
- Composting
- Demonstrating the concept of green manure
- Developing a crop rotation system for vegetables grown on the school farm

ACTIVITY: LEARNING ABOUT AND LABELLING TREES ON SCHOOL GROUNDS

Objectives:

Students will:

1. Identify trees using the common and scientific names
2. Identify the types of fruit trees bear and the insects they attract
3. Identify the uses of their wood
4. Identify any other materials (such as oils) they may produce

Have the students walk around the school grounds and make a list of all the trees.

- Find out the common and Latin names of all trees. (See Booklet - Tree Planting for Schools for some help).
- Have students make posters with drawings of a mature tree, with samples of leaves, buds and flowers.
- Make drawings of the insects and birds found in trees and a list of the various products the trees make. (wood, oil, fruit, etc.)
- Find out about the type of wood. Is it good for making furniture and houses?

- Have children estimate how old the tree is, and have each child draw a picture of how old they or their parents were when the tree as born. If it is a very old tree, ask children to imagine what events have taken place during the tree's life.

Ask a parent to help with making signs for the trees. Try not to nail them directly on to tree trunks as this may allow diseases to enter the tree. The best kind of sign is a small sign in front of the tree, sunk into the earth. Have students paint the common name and Latin name on the tree sign.

BACKGROUND INFORMATION LINKS

- ∞ Trees common and scientific names
- ∞ Forest connections: The forest In your classroom (A closer look at trees
- ∞ Neem –A tree for sustainable development



ACTIVITY: TREE PLANTING PROJECT IN THE COMMUNITY OR AT ANOTHER SCHOOL

Objectives:

Students will:

1. Conduct community outreach activities
2. Disseminate information to others about the importance of trees
3. Take steps to protect the environment by planting trees

This is a particularly good project to do if your school has done a tree nursery. All too often schools that have done a lot of work in collecting seeds and growing young trees let the seedlings die over the summer holiday and they never get planted. Make every effort to plant and look after your baby trees.

If there is not enough space on your school grounds, consider planting trees in another school or common area in the community. Good places to plant trees are:

- around playing fields
- on median strips
- at the side of the road
- in areas of open land
- in a nearby area which has been deforested

Make sure you do not plant trees under power lines, as if it is too close to a power line, it will be cut down by JPSCo. When you have selected the place to plant your trees, make sure that they will be safe from animals such as cows and goats. This is where most tree-planting projects fail. If the land is not fenced, you will

have to protect the seedlings with mesh wire or bamboo sticks.

Plant trees before the rainy season. If you plant trees in June, the chances of them surviving the summer months are very slim.

If you plant in another school:

- encourage classes to adopt a baby tree, to look after it and water it until it is at least two years old
- students should inform other students about the types of trees and why it is important to plant trees

If you plant in a common area, try to work with a community group to look after the trees.

- Involve the PTA and parents
- Take photographs of the trees when they are just planted and monitor their progress
- Have students check on the progress of the trees every month

BACKGROUND INFORMATION LINKS

- ∞ **Trees-Trees are our friends**
- ∞ **Forest Connections: The forest in your classroom**
- ∞ **How to take environmental action**
- ∞ **Neem- A tree for sustainable development**
- ∞ **Booklet-Tree Planting For Schools**

This activity can be infused into the following area of the Primary curriculum

Grade 6 Science

Term 3; Unit 1; Unit title: The Environment and Us

Focus question 3: Why is it important to care for the environment?

Objective

Pupils will:

- ◆ Explain how environmental problems affect the natural cycles

Procedure/activity (Page 367)

#5 In groups plan and design an environmental activity e.g. making a compost heap, planting trees, then carry it out to the end of the term to show commitment to sustainable development

ACTIVITY: PROJECT ON THE IMPORTANCE OF TREES

Objectives:

Students will:

1. Explain why trees are important
2. State the causes and effects of deforestation
3. Explain how the existence of trees affects the quality of life of human beings.

Have students go outside and sit under a big tree:

Ask them to write down how they feel:

- Is it pleasant under the tree?
- Is it a place they would like to spend time?
- How would they feel about a swing under the tree?
- Ask them to write down what they see - leaves, birds, insects, the bark of the tree, branches.

Have students draw and label a picture of the tree. Ask students what they think trees are useful for and how humans benefit from the existence of trees.

Some uses to keep in mind are:

- Wood - for shelter, furniture, fuel
- Prevention of soil erosion - helps agriculture, reduces silt in rivers
- Wind breaks - protects agricultural crops, human settlements
- Shade - keeps people and animals comfortable
- Fruits - trees make food for people
- Medicines - some trees have medicinal uses

- Soil Fertility - trees help to bring nutrients from deep in the soil to the surface, some trees fix nitrogen in the soil.
- Food for animals - some trees produce pods that animals eat
- The air we breathe - trees absorb carbon dioxide which humans breathe out and produce oxygen which humans need
- Habitat for birds and other creatures - what will happen to the animals which live in forests if the forests are cut down?

Ask students to think about what is happening to our trees:

- Why are they being cut down? (For timber, development, agriculture, fuel, roads, etc.)
- What will happen if we have no trees?

Ask students to find a picture of deforestation to bring to school.

Visit an area where trees have been cut down. Have students practice research skills by finding out what happened and what should have been done instead

BACKGROUND INFORMATION LINKS

- ∞ Trees-Trees are our friends
- ∞ Forest Connections: The forest in your classroom (Forests in our lives: Gifts from trees; Forests in the rain)
- ∞ How to take environmental action
- ∞ Neem- A tree for sustainable development

This activity can be infused into the following areas of the Primary and ROSE curricula

Grade 1

Term 2; Unit 1; Unit title: My Family

Focus question 3: How does my family satisfy basic needs?

Objective

Pupils will:

- ◆ Discuss ways in which we depend on plants and animals

Procedure/activity (Page 42)

#5 Discuss ways in which families depend on plants and animals

Grade 2

Term 3; Unit 3; Unit title: Plants and Animals In My Community

Focus question 2: How are plants and animals useful?

Objective

Pupils will:

- ◆ Discuss ways in which we depend on plants and animals

Procedures/activities (Page 175)

#1 Look around their classroom and note things that are made from plants and animals. Talk about the many uses of plants and animals e.g. food, clothing, decorations, pets, paper. Record and report this information in a variety of ways

#10 Examine a display of medicinal plants to see if they can identify them and say what they are used for

Grade 9 Resource and Technology

Module: Agriculture and the Environment

General objective 7 Developing positive attitudes and habits

7.2 (Pages 70-71)

Topics/content outline

The environment

Importance of flora and fauna

(i) Plants

Wind breaks, habitat and food for animals, erosion control, preserve watersheds, maintain atmospheric balance, beautification, control temperature, others

Expected outcomes and skills

Students should:

- Develop an awareness of the role of the environment in sustaining various life forms
- Develop an awareness of the aesthetic value of the environment
- Appreciate the different methods of preserving the environment

Suggested activities

- Carry out various conservation measures
- Tree planting



ACTIVITY: ADOPT-A-TREE PROJECT

Objectives:

Students will:

1. Explain the value of trees
2. State what is needed for the care of trees and why

Have each student bring in a seed to be planted, which will grow into a tree. See the Tree Nursery activity for details about how to plant the seed.

After the seed has sprouted, students take the tree home where it is to be “adopted” by the student’s family. In each class, make a chart of all the families where the trees are located and types of trees. Leave a space for a report from each student once a week.

If possible, have students take a photograph of their tree and put it beside their names.

Each Friday, students should bring in a report on their tree, including the height of the tree, number of leaves, any insects seen, how often it was watered and enter it in the chart. Students should try to get other members of their family involved in the care of the tree.

Trees should be brought in for assessment by supervisors and each class should make a plan about planting the trees. Try to plant most trees in students’ homes and continue with the reporting on the health of the tree.

BACKGROUND INFORMATION LINKS

- ∞ **Trees-Trees are our friends**
- ∞ **Forest Connections: The forest in your classroom (Build a tree)**
- ∞ **Neem– A tree for sustainable development**



Visit an area where trees have been cut down. Have students practice research skills by finding out what happened and what should have been done instead.



ACTIVITY: FIELD TRIP TO LEARN ABOUT TREES

Objectives:

Students will:

1. Explain how trees are grown in a commercial nursery
2. Identify various types of trees and which ones grow well in their area
3. Talk to professionals in the forestry business

TRIP TO THE ARBORETUM AT MONEAGUE, ST. ANN

Telephone the arboretum at 973-0190 and to make an appointment for your visit.

Ask if someone can tell students about the history of the arboretum and the research aspects. Discuss the possibility of each student taking home a tree to be planted in the school or community. This may be possible for a modest charge or even free.

Investigate the possibility of visiting Moneague Lakes as well. This is a good place to show students a ground water lake and talk to them about underground water.

VISITS TO OTHER NURSERIES:

Wherever you make your visits, explain that you would like students to speak to one of the foresters about:

- the trees themselves
- why they grow the ones they do, where they are planted
- who looks after them

- what students can do to help with reforestation
- where the main areas of deforestation are in Jamaica

Have students take a picnic lunch and blankets or ground sheets to sit on and eat their lunch under the trees. Talk to them how eating outside feels. Also use the opportunity to teach students about taking garbage home with them whenever they go outdoors.

Other Forestry Department nurseries at Twickenham Park (St. Catherine), Clydesdale (St. Andrew), Cinchona (St. Andrew) and Williamsfield (Manchester) can be visited:

Contact: Forestry Department
173 Constant Spring Road
Tel. 924-2667-8

OTHER CONTACTS :

Rural Agricultural Development Authority (RADA)

Address: Hope Gardens, Kingston 6
Tel. 977-1158-9

The Caribbean Agricultural Research and Development Institute (CARDI)

Address: P.O. Box 113 Mona Campus
Kingston 7
Tel. 927-1231/977-1222

BACKGROUND INFORMATION LINKS

- ∞ Trees-Trees are our friends
- ∞ Forest Connections: The forest in your classroom
- ∞ Trees-common and scientific names