# SEP TEACHERS' MANUAL

## JUNIOR SCHOOLS

### GRADES 1-9

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ACKNOWLEDGEMENTS

The Schools Environment Programme gratefully acknowledges the contribution made towards the production of this manual by the following individuals and organisations:

Phyllis Reynolds, Sherrill Gardener, Herma Meade, Erma Hutton, Jennivie Tracey and Lorna Thompson of the Ministry of Education, Youth and Culture, for the invaluable support given in training teachers in infusion methodology and guiding teachers in infusing the SEP manual into the various school curricula and syllabuses.

Marjorie Vassell, Consultant, who guided teachers throughout the process of writing material for the manual.

The following teachers for the contributions made by them in providing information for this manual.

Roslyn Bender        May River Primary
Rosemarie Brent-Harris Gideon Education Centre
Clovis Brown         Sligoville All Age
Jean Brown           Negril All Age
Jeffrey Campbell     Inverness Primary and Infant
Cislyn Cole          Holy Childhood Prep
Michelle Desgoutte    Gideon Education Centre
Claudette Forbes     Hampton School
Jacqueline Hamilton  Shortwood Practising Primary & Junior High
Yvonne Hill          Sandy Bay Primary & Junior High
Marie Johnson        Iona Prep
Darcia Llewellyn     Ensom City Primary
Tanya Lue            Happy Grove High
Beverly McKenzie     Glenmuir High
Norev Nelson         Brimmervale High
Christopher Sill     Sydney Pagon Agricultural High
Monica Tabanor       Happy Grove High
Veronica Turner      West Indies College Prep
Ovnelle Smith        Donald Quarrie High
Godfrey Williams     Vere Technical High
Monacia Williams Glenmuir High
Sherene Williams St. James High

The Programme also thanks the following organisations for providing background resources for teachers:

The Forestry Department
The Institute of Jamaica
Jamaica Information Service
The National Environment and Planning Agency
The National Solid Waste Authority
The Pesticides Control Authority
Urban Development Corporation
HOW TO USE THIS MANUAL:

This manual has been divided into sections so that activities can be easily referred to and distributed amongst teachers working on different aspects of the Programme.

Please note the Action Plan (Pages 14-15) and the Keys to Success (Page 16) which will help you to structure your implementation of the Programme. The manual has been revised to provide linkages to the Primary and ROSE curricula. Teachers are therefore encouraged to infuse environmental activities into their regular lessons using these linkages. This will make it easier and less time consuming to implement the programme. Curriculum infusion ideas are found following the activities to which they relate. For some activities there are no direct opportunities for infusion. These can be done as stand alone or environment club activities.

The last section of the manual provides background information on various environmental topics. Background information is also provided in the form of booklets and pamphlets. These can be used to enrich your activities. Links to the background information topics are provided on the activity pages.
MISSION STATEMENT
The Schools Environment Programme is a joint project of the Jamaica Environment Trust (JET) and Jamaica 4-H Clubs to promote environmental awareness, ethics and action in students and to encourage the development of environmentally friendly schools and communities in Jamaica through environmental activities.

OBJECTIVES
The Schools Environment Programme seeks to involve schools in activities which improve the school environment, increase student environmental knowledge and enables schools to serve as examples of sound environmental management within the local community. The programme seeks to help children understand environmental concepts and facts, acquire skills, form helpful attitudes and behave positively towards the natural environment. The programme also aims to train teachers in the delivery of environmental education in and out of the classroom and to increase their knowledge of environmental issues.

The programme is divided into four main categories:
- Managing Your Garbage
- Greening Your School
- Establishing or Strengthening an Environment Club
- Environmental Research

These categories include the following kinds of activities:
- Management of waste through garbage audits, garbage reduction and recycling programmes, litter control and composting;
- Greening (beautifying) the school grounds using organic gardening methods; planting trees
- Establishing or strengthening of an environment club; advocacy
- Research on topics such as Jamaican wildlife, deforestation, energy, water, conservation, and pollution. This may involve community outreach, working with parish environmental groups and sharing lessons learned with the local community;

INCENTIVE TO JOIN
As an incentive for teachers and students, the programme is run as a competition. There will be opportunities to be recognized regionally as well as nationally. Schools will be expected to achieve certain goals throughout the year in order to be eligible for judging, which will be done in April/May each year. Even though there are prizes to be won, the main reward for being involved is increased environmental awareness and action. The improved school surroundings and the development of knowledge and skills in students will enable them to make wise decisions about their natural environment.

Each school must do one activity from each category to be eligible for judging.
SCOPE OF PROGRAMME
All Preparatory, Primary, All-Age, High and Junior High schools island-wide are eligible to enter.

SUPERVISION
A local Non-Governmental Organization (NGO) or a member of the Programme staff will visit each school several times between September and June (see Action Plan pages 12-13) to assist with implementation.

WORKSHOPS FOR TEACHERS
Teacher workshops are held each year to explore various environmental topics as well as to train teachers in the delivery of environmental education in general and the programme specifically.

PLANNING OF PROJECTS
Schools should use the schools’ action plan form to plan their projects, with the assistance of Programme staff. Call your NGO or Programme supervisor if you need assistance in completing your school’s action plan. The school’s action plan for the entire year must be completed and presented to the supervisor by January. All projects must be approved by Programme staff. Certain activities (e.g. compost heap) must be started by the date specified. Blank forms are provided for schools at the beginning of each school year.

IMPLEMENTATION OF PROJECTS
Most classrooms and school-wide activities run from October to March. Staff from JET, Ja 4-H Clubs, or a local NGO will visit your school several times during the year to offer support and answer questions. The Action Plan gives dates for activities to be implemented. Sustainability is a very important part of the Schools Environment Programme so it is important to show evidence that projects will continue during holidays and after judging.

REGIONAL OR ZONE ASSESSMENT
Supervisors will assess your progress as the months go by. If your school is having problems implementing the programme, the supervisors may decide that you need more time and the school will not be recommended for judging.

If you have managed to implement the Programme successfully, regional judges will visit your school in April/May to assess the activities carried out in the four areas. The judges will use the information provided on the first school visit form and assessment reports from supervisors to assess the progress your school has made.

Schools will then be selected for national judging based on a point system. There will also be an opportunity to win category prizes for programme activities. Category prizes are awarded entirely at the discretion of the judges.

Attendance by at least 1 person from each school at both sets of workshops is required to be eligible for judging.
PROGRAMME LEVELS
Schools are divided into senior and junior levels. Junior schools are Primary, Preparatory All-Age and Junior High schools. Senior schools are High and Technical High schools.

Schools may be involved in SEP at one of three levels:
1. **Enrolled Schools**
2. **Affiliated Schools**
3. **Advanced Schools**

1. As an **Enrolled School** you will:
   - Be given two (2) copies of the teachers' manual to guide the school in implementing the programme
   - Receive at least four (4) supervisory visits each year
   - Attend all teacher workshops
   - Receive newsletters
   - Be assessed to see what the school has achieved
   - Be eligible for prizes based on successful implementation of the programme.

2. As an **Affiliated School** you will:
   - Be given one copy of the teacher's manual.
   - Receive two supervisory visits (one at the beginning and one at the end of the school year)
   - Attend at least one (1) teacher training workshop each year
   - Receive newsletters
   - Not be eligible for prizes.

3. As an **Advanced school** you will:
   - Have participated in the programme as an enrolled school for at least two (2) years
   - Have been recommended by programme staff and applied for advanced status
   - Be awarded a sign and citation for your school
   - Be required to have an environmental notice board informing the school of SEP activities and other environmental issues
   - Continue all activities of SEP
   - Receive updates of the teachers' manual
   - Attend all advanced teacher and principal workshops
   - Receive at least one supervisory visit each year
   - Not be eligible for prizes
   - Become a demonstration school, i.e. be able to accommodate visits from other schools.
   - Develop and implement an action plan for making your school a sustainable institution.

Please Note:
Each enrolled school must develop a feasible action plan to be presented to the supervisor on the January visit. At least two (2) activities required by the programme must be started in the Christmas term. If this is not achieved, the school will no longer receive regular supervisory visits and will be moved from the enrolled group to the affiliated group.
JUDGING AND PRIZES
Teachers will be responsible for organizing the presentation of your school's work for the judges, helping to set up exhibits, scheduling drama presentations and selecting students to act as guides and answer questions.

It is very important that students are able to say what was done and why. The work presented must clearly be the work of students. **One hour is allotted for judging each school**, so activities planned must not take longer than about 45 minutes.

The assessment for each zone or region will take place in April/May. Supervisors will assess each school's performance and select regional winners to go on to national judging.

National judging will take place in May/June. Judges chosen by JET will visit the regional winners in order to select the national winners, as well as winners for category prizes and the overall prize for the most environmentally aware school in Jamaica.

Certificates will be awarded to the zone/region winners for both junior and senior schools. At the national level, first, second and third place winners will be chosen and prizes awarded. Category prizes **MAY be awarded at the discretion of the judges for projects such as**: best organic garden, best garbage management, best community outreach or school showing most improvement.

NATIONAL AWARDS CEREMONY
A few students and teachers from each of the winning schools in each zone/region will be asked to attend the National Awards Ceremony in June each year, where the national winners will be announced and the prizes will be presented. Students from selected schools will be asked to present skits, songs or poems which were created as part of their environmental projects. An exhibition of various elements of the programme will also be on display.

SUPPORT TO SCHOOLS
Two copies of the manual will be given to each Enrolled school: one copy to be kept in the Principal's office for reference and one copy for participating teachers to read and use.

The manual will provide guidelines for activities under each category, indicate judging criteria and include various items of background information to assist teachers.

**Please Use The Manual.**

**IT IS DESIGNED TO INFORM AND HELP YOU.**
B. PROGRAMME SUMMARY

Category 1: Managing Your Garbage

Category: 2 Greening Your School

Category 3: Establishing/Strengthening an Environment Club

Category 4: Environmental Research
CATEGORY 1: MANAGING YOUR GARBAGE

Each school will be assessed on the cleanliness and neatness of the school environment. Points will be awarded for adequacy and use of garbage containers, absence of litter, garbage reduction, proper handling and disposal of garbage, composting, recycling and/or reuse programmes and neatness of classrooms.

Schools must choose at least one activity from the list below. Each activity is explained more fully under the Implementation Section of this Manual.

**ACTIVITY IDEAS**

- Compost heap
- Vermicomposting
- Garbage audit
- Classroom sample garbage study
- Litter warden programme
- Garbage reduction campaign
- Reuse, Recycle projects
- Storing, handling and disposing of garbage properly
- “Cradle to grave” study on selected item of garbage
- Litterless lunch campaign
- Field trip to garbage dump
- Any other related activity approved by Programme Staff or your supervising NGO
CATEGORY 2: GREENING YOUR SCHOOL

Each school will be expected to improve the natural beauty of their school yard with trees, gardens or other plantings. Students should know the principles of organic gardening, composting, why trees are important, the scientific names of trees on the school grounds and how plants grow. Keeping records is a particularly important aspect in this category, as plants sometimes die or vegetables are reaped before judging.

Schools must choose at least one activity from the list below. Each activity is explained more fully under the Implementation Section of this Manual.

**ACTIVITY IDEAS**

- Tree nursery
- Organic garden with compost heap or vermicomposting.
- Design and organize a nature walk
- Plant flowers and shrubs to beautify areas of the school
- Investigate the importance and processes of maintaining fertile soil and the hazards of using synthetic fertilizers and pesticides in all types of gardening.
- Learn about trees on school grounds and label them, using Latin names as well as common names
- Do a tree planting project in the community or at another school
- Investigate why trees are important
- Implement an Adopt-a-Tree project
- Organise a field trip to a forest or park
- Any other related activity approved by Programme Staff or NGO
CATEGORY 3: ESTABLISHING/STRENGTHENING AN ENVIRONMENT CLUB

Each school must form or strengthen an environment club, or select an existing club to carry out environmental activities. The club must show evidence of regular meetings and have a slate of officers (e.g. President, Vice President, Secretary).

The club will be expected to undertake at least two small projects or one year-long project within the school and may also participate in a community outreach activity.

Each activity is explained more fully under the Implementation section of this Manual.

ACTIVITY IDEAS

First, you must form or revive an environment club, elect officers, and establish regular meeting dates, preferably a minimum of one per month, and keep records of decisions taken at meetings. Suggested activities for the club are:

• Start a litter warden programme
• Make environmental presentations to the school
• Collaborate with or join with other clubs, such as 4-H, Science and Key Clubs, Scouts or Brownies.
• Undertake an advocacy campaign on an issue of importance to the community
• Make posters to put around the school
• Do a campus, beach, roadside or gully clean-up
• Have an open day for parents on environmental issues
• Organize an essay or poetry competition with an environmental theme
• Develop and perform environmental skits, songs, poetry, drama and dance
• Do bee-keeping in collaboration with a 4-H Club
• Organize a Trash-A-Thon
• Organize an environmental field trip
• Develop an environmental pledge for the school
• Any other suitable activity approved by Programme staff or your supervising NGO
CATEGORY 4: ENVIRONMENTAL RESEARCH

Each school will be required to do research on one topic which is of interest to students and teachers. Each activity is explained more fully under the Implementation Section of this Manual.

SUGGESTED RESEARCH TOPICS

- Observe the animals around the school and record where they live, their habits, food sources and what may threaten them
- Endangered Jamaican animals
- Environmental effects of fossil fuel-based energy
- **Alternative sources of energy (solar, wind, etc.,)**
  - Energy conservation
  - Air, land or water pollution
  - Deforestation
- Water conservation
- Soil erosion
- The importance of wetlands
- Coral reefs
- Biodiversity
- Watersheds and rivers of Jamaica
- Any other suitable topic approved by Programme staff or your supervising NGO

Research should show an understanding of the issue, including environmental and health effects. Students should identify possible solutions and must show evidence of thought and discussion on effective alternatives. Obstacles to successful solutions should be identified as well as ways these obstacles might be overcome. Students could hold discussions with the community to seek solutions.

The expected depth of research will be dependent on the age level of students.
**C. ACTION PLAN**

If your action plan is not submitted at the January visit your school will automatically be placed in the "Affiliated" group.

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<td><strong>AUGUST 25</strong></td>
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<td><strong>SEPTEMBER-OCTOBER</strong></td>
<td>First supervisor visit (Discuss the Action Plan)</td>
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| **BY THIRD WEEK IN OCTOBER** | Tasks to be completed by school are:  
- Action Plan for the Christmas term developed with focus on:  
  ⇒ Garbage Management activities decided, time-table developed  
  ⇒ Greening activities decided, time-table developed  
  ⇒ Area for compost heap identified  
  ⇒ Formation of the environment club and election of officers  
  ⇒ Environmental research project chosen  
  ⇒ Areas of curriculum infusion identified and recorded |
| **OCTOBER**      | • One-day teacher training workshops (in each region)                        |
| **NOVEMBER-DECEMBER** | Optional supervisor visit  
- Fund raising options should be explored  
- You should have started at least 2 (two) activities in any of the four categories. For example:  
  • **Garbage Management**  
    ⇒ Activities such as audits, litter control, recycling programme should be started in November and be well under way by the close of term  
  • **Greening Your School**  
    ⇒ Garden and/or tree nursery - areas should be identified and prepared; problems such as lack of fencing, water or soil erosion should be identified and planned for  
    ⇒ Tree planting - venue decided on; seedlings sourced if separate from nursery  
    ⇒ Compost heap must be started  
  • **Environment Club**  
    ⇒ One club activity should be completed or you should be working on a year-long activity. Records and minutes for the entire project period must be kept  
    ⇒ Plans for the next term in progress  
  • **Environmental research**  
    ⇒ Project should be started  
  • Areas of curriculum infusion should be identified, implemented and recorded |
- Action plan for Easter and Summer terms developed

### EASTER TERM

#### JANUARY
- 2nd Supervisor visit (Continuous Assessment)
- Advanced schools’ workshop

**DURING JANUARY YOU SHOULD**

- Continue activities from first term
- Begin additional activities. Make sure you have now started an activity from each of the four categories. For example:
  - Fully functional waste management programme
  - Planting and caring for garden or trees or doing other greening activities
  - Second club activity or working on ongoing project
  - Working on research project
- Present your Action Plan to your Supervisor

(Remember to infuse environmental education activities into the school curriculum)

#### FEBRUARY
- Second round of teacher training workshops in each region

**BY THE END OF FEBRUARY YOU SHOULD**

- Be continuing and developing activities, e.g.
  - Working on second club activities or working on year-long activities
  - Working on research project

#### MARCH
- 3rd supervisor visit (Continuous Assessment)

You should be nearly ready for assessment:
- Main club activities completed (clubs should still meet and develop and implement activities for after judging)
- Well-maintained garden, nursery or tree planting project
- Other greening activities ready for presentation
- Research project finished
- Sustainability plan completed for Easter holiday for all programme areas, especially greening
- Records and displays being prepared for assessment by judges on all programme areas

#### APRIL/MAY
- Regional judging.
- Beginning of summer term. Activities must be sustained during this period

### SUMMER TERM

#### MAY/JUNE
- National Judging

#### MAY/JUNE
- 4th supervisor visit
  - Evaluate the programme
  - Plan and implement a summer sustainability plan
  - Complete application form for next school year
  - Continue Programme activities

#### JUNE
- Awards Ceremony
1. PRINCIPAL AND TEACHER COMMITMENT
SEP works best when the principal is committed to the programme, and it is supported by teachers at all grade levels.

2. EVIDENCE OF CHILDREN’S LEARNING AND INVOLVEMENT
Various learning skills will be encouraged during the Programme. For example, students will be asked to observe closely, describe accurately, identify and analyze problems, brainstorm possible solutions, prioritize alternatives and select the best solutions.

When judges visit the school, they will ask students questions about their work and project activities. The quality of student response, their enthusiasm, the detailed reasons WHY certain things have been done, the degree to which they know and can explain what they did, what happened and why, the thoroughness of their record-keeping - all these will be central to the judges' opinions about the success of the particular programme activities.

The teacher's role is to organize projects and activities that will promote this learning. Teachers are not expected to make signs or posters, write words for songs or keep records of garbage reductions.

3. INFUSION INTO THE CURRICULUM
Please take note of the infusion ideas which have been provided for various grades/subject areas on the activity pages. These will help you to infuse the programme into your regular day-to-day activities.

Each school will be asked to show evidence that teachers have infused environmental activities into the regular school curriculum. Teachers are encouraged to find appropriate and effective ways to utilize environmental content in mathematics, language arts, art and craft, drama, music, social studies, science, and other subject areas.

4. DEGREE OF CHANGE AND IMPROVEMENT
The degree of change and improvement in the school and/or community environment will be assessed by judges. They will be helped to make such judgments by the “first school visit report” completed by each school at the outset of the project as well as from supervisor reports submitted during the year.

5. PARTICIPATION
Activities should involve a wide cross-section of the school so that all students are aware of the importance of maintaining a clean school environment and of protecting natural resources. The degree of involvement of community groups, parents, the PTA or local vendors and businesses in environmental awareness and action will be assessed. Schools will focus mainly on parents, the PTA and immediate community. Schools can also adopt a nearby river/pond/forest/beach/gully/area of open land.

6. RECORD KEEPING
Students at all grade levels will be expected to keep an accurate log of their activities in garbage management, recycling, tree planting, or-

THE MORE WAYS A SUBJECT IS TACKLED THE GREATER THE UNDERSTANDING.
ganic gardening and field trips. Records will include planning processes, activities undertaken and the results. Environment Clubs will keep records of their meetings, activities and accomplishments. Project purchases and sales (for example, of recycled items or of produce from the garden) should be recorded. It is often useful to document projects with photographs, particularly for gardens, as drought, vandalism or animals can destroy a lot of work overnight.

It is vital to keep records so new people at the school can see how things were done and know immediately what was successful. Good records will enable judges to assess school effort and achievement even after an unanticipated event, such as a flood.

7. CREATIVE PROJECT ACTIVITIES AND PRESENTATIONS
Various methods of carrying out projects or making the students' work 'visible' are encouraged. For example, students are encouraged to create environmental drama presentations, newsletters or magazines, posters, songs, reports, models, art and craft products or to organize events and Open Day exhibitions or other public presentations.

8. SUSTAINABILITY
Evidence of the school's commitment to continue important elements of the Programme will be assessed. It is particularly important to have a plan to handle school holidays, so schools do not have to re-implement programmes each year.
E. IMPLEMENTATION SECTION
CATEGORY 1
MANAGING YOUR GARBAGE
SCHOOLS MUST CHOOSE AT LEAST ONE ACTIVITY FROM THIS CATEGORY

CASE STUDY: CRAIGHTON ALL AGE

Craighton All Age School is in the hills overlooking Kingston, near the district of Redlight. It is a small school – 180 students. The school used to have a major problem with drink containers, both juice boxes and PET plastic bottles. These containers were thrown in a pile near the school.

The students at Craighton cleaned up the garbage pile and planted their organic garden in its place. They then banned all drink containers from the school grounds. Students were asked to bring fruits from home, such as limes, oranges, otaheiti apples, etc. and the canteen staff made fresh juices every day, which the students drank out of reusable plastic cups.

The students benefited by more nutritious drinks and less garbage.

PROPER GARBAGE MANAGEMENT IS ESSENTIAL FOR A CLEAN, HEALTHY AND SAFE SCHOOL
**ACTIVITY: COMPOST HEAP**

**Objectives:**

**Students will:**
1. Explain how natural systems work
2. Define the term "biodegradable"
3. Make compost for use in gardens
4. State the advantages of using compost
5. Reduce garbage on school grounds
6. Involve parents by bringing organic waste from home

Starting your compost heap is one of the very first activities you should do, because it takes time for waste to break down and you will need the compost as fertilizer for your garden. You do not need a big hole to make a compost heap; in fact, a hole makes it difficult to reap and turn compost. If possible, build your compost heap in a shaded spot. If you put it in direct sunlight, it will dry out quickly and need more care.

Start collecting your compost materials. Many schools do not generate enough organic materials so ask children to bring waste from home.

Here’s what can go into a compost heap:
- Fruit and vegetable peelings (e.g. banana peel, orange skins, yam skins, potato peel)
- seaweed
- coffee grounds, tea bags
- garden cuttings (e.g. grass, small leaves)
- animal manure, chicken, horse or cow is best. Not dog or cat!
- a little dirt
- small amounts of wet, torn up newspaper

Although you can build a container for the compost heap with wood and chicken wire, it is not absolutely necessary.

1. Start by digging up the ground where you plan to put the compost heap. Then put some cut grass and bigger leaves on the bottom.
2. Layer all the other materials until you have a pile; the best size is about 3-4 feet square and 3-4 feet high. (A bucket is much too small, but a 45-gallon drum can work for a small garden.)
3. Add some dirt and water. Don’t make it too wet. The compost should be damp but not rotting.
4. Keep adding layers until your compost heap is the right size.
5. Cover the final layer with grass cuttings, which will reduce the number of fruit flies.
6. Check the compost heap every day or two and make sure it doesn’t dry out. Take a fork and turn the heap every week or two.

If you cover the compost heap with a black garbage bag, it will heat up and work faster. After a while stop adding new stuff and leave the compost heap to break down, still turning it occasionally, making sure it doesn’t dry out. When it has formed a rich crumbly soil it is ready to be added to your garden.

**Do not put food scraps like leftover lunch, cheese, meats or oils into your compost heap! No human, dog or cat manure! No crackers or bread! No glass, plastic, tins or wood!**

**IF YOU FOLLOW THESE RULES, YOU WILL NOT HAVE RATS OR SMELLS.**

**BACKGROUND INFORMATION LINKS**

∞ How does a leaf turn to soil?
∞ How long does it take garbage to biodegrade?
ACTIVITY: VERMICOMPOSTING

Vermicomposting refers to using earthworms to process garbage. Earthworms are nature’s own recyclers, they are cultivators of the soil and they improve aeration, drainage and fertility. The composting or mature earthworms (Eisenia fetida) eat and digest the garbage, then excrete a fertile soil-type material rich in calcium, nitrogen, phosphorous and potassium.

Objectives:
Students will:
1. Explain how natural systems work
2. Define the term “biodegradable”
3. Make compost for use in gardens
4. State the advantages of using compost
5. Reduce garbage on school grounds
6. Involve parents by bringing organic waste from home

TO MAKE THE WORM COMPOST YOU NEED:
• A container for the worms to live in
• Waste materials for the worms to feed on (as with a regular compost)
• A supply of mature worms

THE WORM CONTAINER
Boxes can be provided with the worms inside by persons who set up worm composts. Students then put cut up organic waste into the boxes. This may be a good option for many schools. A regular dustbin with a tight-fitting lid and ventilation/drainage holes also makes a good worm container. The container must provide moist but ventilated and drained surroundings, as the worms dislike too much water.

THE WORMS
The worms must be mature worms and are best sought from persons with an already established worm composting system. These sources can often provide bins. Worms and the compost that comes with them should have hundreds of eggs to get you started. If the supply has no eggs, 100-150 worms will be needed to get the compost going.

MAKING THE COMPOST
1. Place a thin layer (3 inches) of rich soil on the boards in the bin
2. Put worm compost or pile of worms on top of this
3. Add a 4 inch layer of organic scraps. No more food should be added until the worms have begun to break this down. Layers up to 6 inches thick can be added after this (usually after 1-2 weeks).
4. Stir when putting in additional layers of food to distribute worms

Decton Hylton at the International School of Jamaica will come to your school and help you set up your vermicomposting project. Contact JET and we will put him in touch with you. The Ja 4H Clubs also does vermicomposting.
ACTIVITY: GARBAGE AUDIT

Objectives:
Students will:
1. Identify the type and quantity of solid waste produced by the school at the beginning of the project.
2. Compare these figures with figures collected at the end of the project to see whether garbage levels have been reduced.

How to Start

- Make sure there are bins in classrooms and in different places around the school grounds, especially where garbage is generated, e.g. the tuck shop or canteen.
- Identify and list the four (4) items of garbage your school generates in large quantities by examining your garbage containers. (If one of these items is a reusable or recyclable item, this will be useful to you for the reuse, recycle activity.)
- Start on a day when the garbage bins are full. Ensure all trash has been picked up from the school yard and put in the bins.
- Issue students with gloves and dust masks and have them sort the garbage into piles (e.g. Juice boxes, plastic bottles, paper, etc.).
- Do not collect or audit food items such as fruit peels and leftover scraps.
- Have other students count and record the garbage in a book, including the date of the audit.

You can either repeat this process weekly, or whenever the garbage bins are full, OR you can decide to have different garbage bins for each of your four items. This works quite well in a small school. Have the students paint labels on garbage drums.

Whichever method is used, garbage should be counted regularly and you must record your results at each audit in order to calculate your monthly figures.

Once the monthly figures have been calculated an Audit chart can be created. This chart should show that the amount of garbage generated is being reduced. The garbage audit book will be inspected by the judges.

Each class should participate in this activity to get a better understanding of how much garbage is being generated. Suggest a competition between classrooms to see which can produce the least garbage.

Making the Audit Chart

Draw up an Audit Chart on cartridge paper (see example on page 22) listing the four most numerous items of garbage. Enter the figures for each garbage item every month. Students can decorate the chart. This chart is to be displayed in a place where the students can look at it each month. When the figures for garbage are audited for the last time in June, the students will see if they have effectively reduced their garbage.
Category 1: Managing Your Garbage

Sample Audit Chart

<table>
<thead>
<tr>
<th></th>
<th>Folder Paper</th>
<th>Juice Boxes</th>
<th>Plastic Bottles</th>
<th>Banana Chips Bags</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>1020</td>
<td>568</td>
<td>423</td>
<td>892</td>
</tr>
<tr>
<td>November</td>
<td>924</td>
<td>543</td>
<td>226</td>
<td>765</td>
</tr>
<tr>
<td>January</td>
<td>845</td>
<td>486</td>
<td>164</td>
<td>659</td>
</tr>
<tr>
<td>February</td>
<td>761</td>
<td>395</td>
<td>98</td>
<td>623</td>
</tr>
<tr>
<td>May</td>
<td>603</td>
<td>311</td>
<td>59</td>
<td>602</td>
</tr>
</tbody>
</table>

BACKGROUND INFORMATION

LINKS
- How long does it take garbage to biodegrade?
- Valuing trash to secure cash
- How to recycle paper
- Polystyrene fact sheet

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

Grade 3

Term 3; Unit 1; Unit title: Living and non-living things in my environment

Focus Question 3: How are living and non-living things affected by changes in the environment?

Objectives
Pupils will:
- Discuss the importance of proper disposal of waste
- Use tally marks to record data

Procedures/activities (Page 278)
#3 Select an area in the schoolyard or community and tally the numbers and types of garbage (eg. juice boxes, plastic containers or bags, old cans) and report this information using a bar graph. Create a poster to convey the message that it is wrong and unhealthy to litter and dispose of garbage improperly
#4 In groups discuss and then record what effects littering and other improper disposal practices have on living (including human beings) and non-living things
ACTIVITY: CLASSROOM SAMPLE STUDY

Objectives:
Students will:
1. Estimate the type and quantity of garbage produced by the school using a sample of the waste produced by one class
2. Reduce the amount of waste produced by the end of the study

HOW TO START
- Select one class in the school to be the sample. Carry out your study for thirty days.
- Identify and list the items of garbage the class generates on a daily basis by examining the garbage containers in the classroom. If you cannot count every day, then it should be done at least once or twice a week. (If one of these items is a reusable or recyclable item, this will be useful to you for a reuse/recycle activity.)
- Assign monitors to ensure that all classroom garbage is thrown in the bins. Issue students with gloves and dust masks and have them sort the garbage into piles. (e.g. juice boxes, plastic bottles, paper and plastic snack bags) Do not collect or audit food items such as fruit peels and leftover scraps.
- Have other students count and record the garbage in a book for this purpose, including the date of the audit. This will help in creating audit charts. Your audit book will be inspected by the judges.

MAKE AN AUDIT CHART
Draw up an Audit Chart (see example below) listing the items of garbage. Enter the figures for each garbage item each day. This chart is to be displayed in a place where students refer to it easily. When the figures for garbage are audited for the last time on the thirtieth day, you will be able to estimate the amount of garbage produced by the class for a month.

Then calculate roughly the amount of garbage produced by the school, by multiplying your figure by the number of classrooms in the school. Work out how much garbage is produced per student each day.

This study is to be repeated at the end of each term and the garbage levels at the beginning and the end of each term compared and analysed using the audit chart.

BACKGROUND INFORMATION LINKS
- How long does it take garbage to biodegrade?
- Valuing trash to secure cash
- How to recycle paper
- Polystyrene fact sheet

SAMPLE CLASSROOM AUDIT CHART

<table>
<thead>
<tr>
<th></th>
<th>Folder Paper</th>
<th>Juice Boxes</th>
<th>Plastic Bottles</th>
<th>Banana Chips</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 1</td>
<td>200</td>
<td>52</td>
<td>110</td>
<td>93</td>
</tr>
<tr>
<td>January 2</td>
<td>170</td>
<td>40</td>
<td>100</td>
<td>82</td>
</tr>
<tr>
<td>January 3</td>
<td>150</td>
<td>35</td>
<td>98</td>
<td>64</td>
</tr>
</tbody>
</table>
This activity can be infused into the following areas of the Primary curriculum

**Grade 4 Mathematics**
**Term 1; Unit 4; Unit title: Statistics**

*Focus question:* How do I collect, organise, display and interpret information taken from my environment?

*Objectives*

- Use sampling techniques to collect information and conduct a survey
- Present data using pictographs and bar graphs
- Classify and sort collected data
- Identify the population in any given problem situation

*Procedures/activities (Page 68):*

#3 Discuss what is required for the production of a graph
- a. Deciding on a topic to survey  
- b. deciding on the population and sample  
- c. collecting data through observation/questionnaire  
- d. recording data  
- e. graphing data

#4 Work in groups to carry out their own production of one type of graph using the steps cited in activity #3

#6 Read and interpret information from bar and line graphs

---

**Grade 5 Mathematics**
**Term 1; Unit 4; Unit title: Statistics**

*Focus question 2:* How can I display and interpret information collected?

*Objective*

Pupils will:

- Draw pictographs, circle graphs, line graphs, bar graphs, double bar graphs to show given data and interpret such graphs when given them

*Procedure/activity (Page 59)*

#1 Discuss and draw graphs of various types to display information they have been given or they have collected. Discuss the most appropriate type of graph to draw in each situation and why
**ACTIVITY: LITTER WARDEN PROGRAMME**

<table>
<thead>
<tr>
<th><strong>Objectives:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Students will:</strong></td>
</tr>
<tr>
<td>1. Keep classrooms and school yards clean</td>
</tr>
<tr>
<td>2. Discuss the topic “Garbage is everybody’s problem”</td>
</tr>
<tr>
<td>3. Exercise proper waste handling</td>
</tr>
<tr>
<td>4. Demonstrate a sense of responsibility for their environment</td>
</tr>
</tbody>
</table>

Discuss the need to keep the environment clean. Involve the students by getting them to decorate garbage drums with slogans that promote putting trash in the cans. This will make the drums more appealing and encourage students to dispose of litter properly.

Start a **Litter Warden programme**. This can also be an activity of the environment club. Litter wardens can be selected from each class, grade level, house, or can be environment club members. Litter wardens should be clearly identified (by use of badges, sashes, special uniforms) and should decide how their duties are to be carried out.

Litter wardens could inspect school grounds daily or weekly. They could grade areas of the school and report to assembly how well the school is doing. Competitions can be held between classes, grades and houses to see who keeps their area the cleanest. Litter wardens could give talks to the school on how much garbage the school is producing. Litter wardens must not simply pick up litter, but must observe students littering and take steps to encourage them not to do so.

<table>
<thead>
<tr>
<th><strong>Useful Garbage Management Tips</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Separate your garbage, it’s easier to manage this way.</td>
</tr>
<tr>
<td>2. Label your bins properly to guide students where to throw their garbage.</td>
</tr>
<tr>
<td>3. Use less paper by using both sides of the paper, by using bulletin boards instead of handouts and by creating your own message pads from used paper.</td>
</tr>
<tr>
<td>4. Use reusable plates and cups that can be washed in your own canteen and eliminate the use of disposable boxes.</td>
</tr>
<tr>
<td>5. Reduce or eliminate burning. Identify what is burned: plastics and rubber should never be burned.</td>
</tr>
<tr>
<td>6. Start an advocacy campaign to have the garbage at your school collected regularly.</td>
</tr>
</tbody>
</table>
This activity can be infused into the following areas of the Primary curriculum

**Grade 1**

**Term 1, Unit 1, Unit title: Who Am I?**

**Focus question 2:** To which group do I belong?

**Objectives**

Pupils will:

♦ Identify groups to which they belong (class, school, religious group, club, race, family, country)
♦ Talk about why groups have rules
♦ Show by their behaviour that they value rules and regulations
♦ Discuss the responsibilities of members of groups

**Procedure/activity (Page 13)**

#2 Discuss the rules and responsibilities of a group to which they belong and how these rules affect members of the group. Discuss relationships made/broken as a result of not observing values such as honesty and truthfulness

**Grade 3**

**Term 2, Unit 1, Unit title: Providers of Goods and Services**

**Focus question 3:** How do rules help workers at the workplace?

**Objective**

Pupils will:

♦ Develop and implement activities for maintaining the cleanliness of home, school, community

**Procedures/activities (Page 229-230)**

#2 In groups discuss and list the rules at home, school and the workplace, and then group them e.g. safety rules, rules for cleanliness. Establish rules for the class. List and display them using the computer or other resource. Identify and design an appropriate compliance strategy for each rule.

#3 In groups plan strategies to monitor the successful implementation of the rules. Prepare, from discarded material, receptacles for classroom garbage disposal, and discuss the appropriateness of their use
Category 1: Managing Your Garbage

ACTIVITY: WASTE REDUCTION CAMPAIGN

Objectives:
Students will:
1. Describe what happens to garbage when it is thrown away
2. Explain the benefits of garbage reduction and reduce the amount of garbage produced by the school
3. Assess the financial and other costs of garbage disposal
4. State the consequences to human health of not handling garbage properly
5. Explain why the only ultimate solution to solid waste problems is reduction

It is easiest to do a waste reduction programme in conjunction with some kind of garbage audit. Students must have some appreciation of the amount and type of garbage the school generates before they can fully appreciate the effects of reduction.

Discuss with students how garbage is handled once it is thrown away. Here are some questions they could answer:

- Is garbage burnt on school grounds?
- What are the health effects of this?
- Is garbage transported to a dump?
- Is the garbage at the dump burnt?
- What are the community health effects of this?
- What are the costs of managing the dump?

Remember the 5R’s – Reject, Reduce, Reuse, Recycle and Repair

Students can consider the hidden costs, such as air and water pollution and the threats to the health of those people working on the dump.

Research can be done into how much garbage disposal costs the school and the community – include the cost of a groundsman, if applicable. Discuss with students who should pay these costs. Should it be the people who buy the packaging? The companies who produce it? All taxpayers, whether or not they buy the package?

Ask students to consider how the garbage could be reduced. Some ideas could be:

- An outright ban of packaging such as juice boxes, plastic bottles, etc.
- Allowing students to bring items of packaging containers onto the school grounds, but insisting that the containers must be taken home with them. This will encourage students to put the responsibility for garbage disposal where it belongs – with the producers, buyers and users of packaged products.
- Reuse and recycling projects. Ensure paper is used on both sides. Consider a compost heap for organic waste. Plan craft projects, such as paper mache, to use wastepaper. Consider providing nutritious juices in reusable plastic cups instead of sodas. This works best in a small school, but can also be done as a class project.

Measure the results of your efforts. Have you produced less garbage? Has the school benefited in any way?
Recycling/reuse projects are very good ways to reduce the amount of garbage thrown away. A product is recycled when it is collected after consumer use and reprocessed into the same or another item. A product is reused when it is used more than once before it is discarded, either for the same or different things.

Most of us reuse some things every day without really thinking about it. For example, we share the newspaper with other people or we pass on children's outgrown clothes to younger children. However, the recycling industry in Jamaica is just beginning.

Students are asked to choose one item of garbage that can be recycled or reused and to think of innovative and creative ways to ensure it is not used only once and thrown away.

- Can it be used to make craft products?
- Or can it be sold to an industry that will reprocess it into another usable product?
- Can the students think of a way for their recycled/reused item to generate income?

The items you choose for recycling/reuse should be volume items and should be easily identified through a garbage audit or through observations. Examples might be glass bottles, plastic (PET) bottles or tin cans. Paper can be reused in all kinds of projects. Juice boxes can be used for craft items or planting seedlings. See how creative you can be.

If you select a recycle/reuse item, have students label two or three garbage bins around the school which will be used for this item only. You can paint the drums creatively.

SEPARATING THE RECYCLABLE/REUSABLE ITEM
After the drums have been labeled "Plastic Bottles" or "Juice Boxes" or whatever you decide to recycle/reuse, students must be told that only those items go into the labeled drums.

The Judges will inspect how the items have been reused or recycled. Making a craft display of reused ideas will gain high marks. Students must be encouraged to bring these items from home as well as to collect them on the school grounds.

COMPACTING AND STORING
If you are recycling an item to take to a recycling company, depending on the item, you may need to flatten it as much as possible to maximize storage space. When the collection drum is full, the items can be removed and stored in old feed bags until sale or transportation to the recycling company takes place.

RECORDING
Students should count and record the recycle/reuse item during the collection period. This task can be undertaken by the Environment Club and/or different grades.

RECYCLING AND REUSING
The meaning and importance of recycling and re-using should be discussed so that the students understand why it is important to reduce their garbage and to put all litter and trash into garbage cans. Make sure there are trash bins in each classroom and at various other points on the school grounds. Ask students to brainstorm all the ways garbage can be reduced and make a list of their ideas.

Why recycle and reuse? Some reasons are:

- Burning can cause asthma attacks and other respiratory illnesses
- Garbage dumps are already too full
- Garbage blocks gullies and causes flooding
- Garbage creates an unhealthy environment because it encourages disease carriers such as flies, rats and mosquitoes
- Many items are made from non-renewable resources
- Students can brainstorm other reasons

BACKGROUND INFORMATION LINKS
- How long does it take garbage to biodegrade?
- Valuing trash to secure cash
- How to recycle paper
This activity can be infused into the following areas of the Primary and ROSE curricula.

**Grade 1**

**Term 3; Unit 1; Unit title: Myself At School**

*Focus question 1*: How do I know my school?

*Objective*

Pupils will:

♦ Tell ways in which they can take care of the school and the things in it

*Procedure/activity (Page 62)*

#3 Talk about items in the school they should care for (e.g. buildings, plants, furniture, equipment) and how they should care for them. Develop a class project on care of the school e.g. “Care our school campaign”, making use of discarded materials.

**Grade 2**

**Term 2; Unit 2; Unit title: Satisfying Our Needs**

*Focus question 2*: How am I educated?

*Objective*

Pupils will:

♦ Draw and make models of important features of places in the environment

*Procedure/activity (Page 132)*

#10 Use discarded objects (e.g. juice boxes) to construct a model of their school.

**Grade 2**

**Term 3; Unit 1; Unit title: This Is My Community?**

*Focus Question 3*: Who are the people in my community?

*Objective*

Pupils will:

♦ Make objects for named purposes using given materials

*Procedure/activity (Page 157)*

#10 Design and make a recycling bin for the classroom in order to separate garbage into groups. Consider ways to recycle/dispose of different types of garbage. Write labels and instruction cards to be posted in the classroom.

**Grade 4 Visual Arts**

**Term 1; Unit 2; Unit title: Seeing & Working Like An Artist**

*Focus question 2*: How can I use forms and textures to create an object?

*Objective*

Pupils will:

♦ Explore a variety of forms and their potential for composition building

*Procedure/activity (Page 181)*

#1c Use any number of found and discarded objects/materials e.g. wood blocks, plastic, cord, cardboard to create an interesting composition.
**Grade 6 Music**

**Term 1; Unit 2; Unit title: Music In Everyday Life**

**Focus question 3:** How do I sequence sounds to create songs and accompaniments reflecting styles, moods and structures?

**Objective**

Pupils will:

♦ Make up suitable accompaniment to reflect mood, styles and structures in songs created

**Procedure/activity (Page 74)**

#2 Create accompaniment appropriate to style, mood, structure and period of the songs performed in class

**NOTE FOR THIS INFUSION:** Accompaniment can be made from waste material

**Grade 8 Resource and Technology**

**Module: Design Arts**

**General objective 4:** To protect and conserve in the environment

**4.3 (Page 134)**

**Topic/content outline**

- Utilizing discarded/waste materials
- Types of waste/scrap materials—recyclable, biodegradable, re-workable, reusable

**Expected outcomes and skills**

The student should:

- Demonstrate an understanding of the potential environmental and economic viability of reuse and recycling

**Suggested activities**

- Have students collect packaging from products they buy during a week. Sort them into categories e.g. paper, plastics, then make a display on recycling

**4.4 (Pages 134-135)**

**Topic/content outline**

Designing for conservation

**Expected outcomes and skills**

The student should:

- Explore the design potential of a range of reusable materials

**Suggested activities**

- Choose a re-workable material and develop use for it

**Module: Home and Family**

**General objective 4:** Protecting and conserving resources in the environment

**4.4 (Page 174)**

**Topic/Content outline**

- Utilizing discarded materials

**Expected outcomes and skills**

- Design and make articles from discarded materials

**Suggested activities**

- Use the design process to plan and make articles from discarded materials
ACTIVITY: STORING, HANDLING AND DISPOSING OF GARBAGE PROPERLY

Objectives:
Students will:
1. State the health consequences of poor garbage handling
2. Outline correct ways to store, handle and ensure safe waste handling at all times!

Students will observe or interview school staff to learn:
- how and where garbage is stored on the school grounds, in what kinds of containers, and for how long;
- how garbage is disposed of, how often, where it goes and whether it is burned or buried on the school grounds.

Students will discuss the advantages and disadvantages of different methods. Problems of garbage collection, storage and disposal should be outlined and students should understand the environmental and health effects of burning as a method of garbage disposal.

Students should brainstorm to find alternatives to burning garbage and display knowledge of the environmental and health effects of burning.

BACKGROUND INFORMATION LINKS
- Environment and Health
- How long does it take garbage to biodegrade?
- Valuing trash to secure cash
- How to recycle paper
- Polystyrene fact sheet
- Earth facts– Why burning is a bad idea

Garbage reduction and efficient garbage management are needed to decrease the strain on the earth

Ensure safe waste handling at all times!
Category 1: Managing Your Garbage

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

Grade 4 Social Studies
Term 2; Unit 2; Unit title: How we affect the environment as we meet our economic needs
Focus question 1: How do we affect the environment as we meet our economic needs in (a) agriculture (b) tourism (c) mining (d) manufacturing (e) trade?
Focus question 2: How can we preserve the environment as we meet our economic needs?
Objectives
Pupils will:
♦ Show willingness to keep waste at a minimum and dispose of it in ways that are least harmful to the environment
♦ Begin to develop the habit of behaving in ways that will minimise/prevent environmental damage in their home, school and community
Procedures/activities (Page 292)
#2 Observe the school compound to see what people do with waste and
(a) discuss the types of waste seen and the methods of disposal used
(b) Evaluate the environment of the school compound in relation to methods of disposal (cleanliness, smell, beauty)
Procedures/activities (Page 300)
#1a Go on a walk about the school compound and identify areas where damage to the environment is evident e.g. burning area, littered areas, waste water flow.
#1b Make and distribute fliers and posters to inform the school community about the problems identified and suggest the need for corrective measures to be taken
#1c Develop a class plan and share with school population and implement plan. Plans could include sorting waste from school in biodegradable and non-biodegradable waste, then disposing of them appropriately and making compost for the school garden

Grade 7 Social Studies
Unit 3: Social and environmental issues
Subtopic A: Good health practices (Pages 36-39)
Specific learning outcomes:
Knowledge
Students should be able to:
4 Explain the importance of keeping healthy
Attitude
Students should:
2 Demonstrate a willingness to keep themselves and the environment clean and safe
Content
9 Some common health problems, their symptoms, causes, effects and treatment: typhoid, asthma, gastroenteritis, malnutrition, hepatitis
Learning activities
6 Matching causes and effects of health issues
10 Making suggestions re classroom health rules and sanctions
Grade 8 Resource and Technology
Module: Industrial techniques
General objective 4: Protecting and conserving resources in the environment
4.1 (Pages 209-211)
Topics/Content outline
-Definition of waste
-Safe disposal of waste
-Pollution control
Expected outcomes and skills
Students should:
-Understand the effects of waste on the environment
-Appreciate the importance of safe disposal of waste
-Recognise the importance of pollution control
Suggested activities
-Compile list of harmful effects of waste
-List methods of safely disposing of waste
-Compose songs and poems on waste disposal
-Field trip to an industrial plant to observe pollution control measures

Grade 9 Language Arts
Unit 1: Theme: The environment/the community
Module 1: Understanding the environment
3 Brainstorm problems facing the environment and how to solve them
Tasks and activities (Page 90)
4 Discuss pictures illustrating environmental hazards—fire, water, garbage, destruction of trees. Get students to discuss
ACTIVITY: CRADLE TO GRAVE STUDY ON SELECTED ITEMS OF SOLID WASTE

Objectives:
Students will:
1. Identify what items of packaging are made from through "cradle to grave" studies
2. What happens when it is thrown away

A "Cradle to Grave" study involves looking at the lifespan of a selected item of garbage from its raw material state to when it is disposed of.

Students can therefore undertake research about one item of garbage in order to learn:

- what natural resources the item is made of
- the industrial processes used to make it
- what other raw materials are used
- what the product is used for
- how it is disposed of
- what are its recycling or reuse possibilities
- how long the item takes to biodegrade
- what happens if it is burnt, etc.

An education campaign about the item should be undertaken for other students in the school and posters displayed.

BACKGROUND INFORMATION LINKS
- Environment fact sheet-Paper
- How long does it take garbage to biodegrade?
- Polystyrene fact sheet
ACTIVITY: LITTERLESS LUNCH CAMPAIGN

**Objectives:**

**Students will:**

1. Explain how making informed choices about packaging can reduce garbage
2. Explain how individual choices can have positive effects

Help students brainstorm all the ways they can avoid having trash left over from their lunches. For example:

- bring all foods in reusable containers and lunch boxes
- take any used packaging or napkins back home in lunch boxes
- ban juice box containers and plastic bottles from school grounds
- put fruit and vegetable scraps in a bin marked for compost
- work cooperatively with canteen staff or vendors on school property to avoid food packaging
- award prizes to students who consistently bring litterless lunches
- Discuss nutritional value of different foods, (e.g. - a banana vs. sandwich biscuits). Show how even the packaging of the banana is better.

**BACKGROUND INFORMATION LINKS**

- How long does it take garbage to biodegrade?
- A zero waste lunch
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.
Category 2: Greening your school

ACTIVITY: TREE NURSERY

<table>
<thead>
<tr>
<th>Objectives:</th>
<th>Students will:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Explain why trees are important</td>
</tr>
<tr>
<td></td>
<td>2. Plant trees either at school or in the community.</td>
</tr>
</tbody>
</table>

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
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.
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 lean 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 a 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 effect 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 repellant 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)
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:

1. Describe some ways in which new plants can be grown without seeds
2. 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**
- 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**
- 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:
   1. Johnny shot down a bird's nest
   2. All the trees, grass and other plants were destroyed in a certain area
   3. 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**
- 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 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-drumns, 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 curriculum

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
Category 2: Greening your school

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
B 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
Category 2: Greening your school

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
CATEGORY 3
ESTABLISHING/STRENGTHENING AN ENVIRONMENT CLUB
ESTABLISHING/STRENGTHENING AN ENVIRONMENT CLUB - CATEGORY 3

Overall Objective: To ensure a student group is started or strengthened to continue working with students on environmental issues.

While you want to have the whole school involved in your environment programme, one of the most effective ways to get activities done is to have a core of student leaders.

Forming an Environment Club in your school is a useful way to do this. This group can be the voice of environmental concerns in your school and community and can take the lead in implementing some activities. If starting a new club is not feasible, environmental activities can be carried out by other clubs eg 4H, science and key clubs. Schools that choose not to have a club but to adopt a whole school approach may do so. However, you will be required to show evidence of student leadership and students should be involved in planning activities. Records of activities undertaken by all classes must be kept.

THE CLUB WILL BE EXPECTED TO UNDERTAKE AT LEAST TWO SMALL PROJECTS OR ONE YEAR- LONG PROJECT WITHIN THE SCHOOL AND MAY ALSO PARTICIPATE IN A COMMUNITY OUTREACH ACTIVITY

CASE STUDY: PEP CLUBS

The Portland Environmental Protection Association (PEPA) is a strong parish-based NGO. PEPA has encouraged the formation of student environment clubs called PEP Clubs at several schools in Portland. The Clubs have elected officers, a motto, pledge, song, hand-sign and club manual. PEPA holds training workshops for principals and teacher coordinators to increase their level of environmental awareness and also to teach specific skills, such as gardening and composting.

PEP Clubs have established school gardens, implemented litter control programmes, conducted research projects and developed drama presentations and skits. “It is good being involved in the club as we can tell people about what not to do, help people not to litter the place and not destroy the ozone layer,” says 10-year old Danielle Nicoleson, President of the PEP Club at the Gideon Education Centre.
FORM AN ENVIRONMENT CLUB AND ELECT OFFICERS

Objectives:
Students will:
1. Demonstrate leadership skills
2. Take action to address environmental issues
3. Plan and implement environmental projects in and outside the school
4. Make presentations to the general school population about environmental issues

LEADERSHIP AND PARTICIPATION
The environment club will be expected to be organized by students, with student leadership. However, each club should have at least one faculty advisor. The role of the faculty advisor is very important, especially with younger children. Care must be taken that projects are not too ambitious, especially at first.

Students should nominate and then vote on a slate of officers (President, Vice-President, Secretary, Treasurer). The Secretary will keep minutes of all the meetings held by the club reflecting decisions taken. The group will also decide how often they plan to meet (at least once per month). The role of the club leaders is to help the group stay on track by asking questions and helping the group to think clearly and make good choices.

SELECTING A FOCUS AND PROJECTS
The Club needs to select a name to reflect its activities and focus. The first two or three meetings should discuss the type of projects the Club would like to undertake. Students should be encouraged to decide what kind of Club they want:
• Will it be an advocacy group?
• An educational group?
• Will the group do on-the-ground activities?

IN-SCHOOL EFFORTS
Club efforts should be focused mainly in the school and with PTAs, school vendors, or 4-H clubs and other clubs. Clubs could undertake any of the activities listed in the other categories of this programme.

EFFORTS OUTSIDE THE SCHOOL
Clubs should undertake at least 2 projects each year, one of which could be targeted to a community outside of the school. Clubs are also encouraged to find ways to share environmental information with another school especially ones which are not a part of any environmental education programme.

FUND RAISING
Environment Clubs sometimes need funding for special project activities and field trips.

After the group has decided on what it wants to do, students must:
• Quantify the costs involved and decide how funds are to be raised
• Identify cash or in-kind contributions that can be obtained. Parents or the PTA can be asked to help with contributions.

The Club should be encouraged to develop income-generating activities, such as cake sales or walk-a-thons. Some schools have done Trash-a-Thons as well.
INFORMING THE ENVIRONMENT CLUB
The Club needs to make sure its members are informed on environmental issues, seek out guest speakers and encourage projects and field trips.

SUSTAINABILITY
The main difficulty with maintaining a strong environment club is continuity. As students move through the school, it may get harder for them to find the time for student clubs.

The Club needs to devise a membership policy to ensure a constant inflow of students from junior grades. However, leadership is often more effective if students are older. There needs to be a clear mechanism for hand-over to younger leaders.

Club leaders can also discuss ways to include other non-member students in environmental activities.

SUCCESSFUL PROJECTS
Encourage the students in the environment club to consider the following issues when deciding on the type of projects to be undertaken:

• Will the project survive the summer holiday? Environment Clubs often do tree planting without planning how the trees will survive the long summer holiday.
• Is the project sustainable? Again, clubs often do short-term clean-ups which have to be repeated over and over. Challenge the club to think of ways to ensure their project will be sustainable over the long term.

• Are club meetings interesting? Often meetings become boring and membership falls off.
• Are the chosen activities fun as well as educational? Activities such as field trips boost morale.
• Are projects too ambitious. Keep in mind your capabilities when planning projects and be moderate about your expectations. Most environmental projects have to be looked at over the long term.

COMMUNITY OUTREACH ACTIVITIES
The club members can be effective advocates for environmental issues. Community outreach programmes also bring students a greater appreciation of obstacles to good environmental practices, such as improper garbage disposal, illegal sand mining, deforestation, water contamination by factories, etc.

Students must document the steps they take in doing community outreach. Photographs may be useful to help the judges understand what the club has done.

PRESENTATIONS
Club members should consider making presentations at assembly, PTA meetings and to community groups. Club leaders may also organize activities that will involve the vendors on or around the school compound.

RECORD KEEPING
Students will be expected to keep records of meeting dates, agendas, decisions made, and activities undertaken. Faculty advisors can help club members brainstorm things that should be recorded and help choose appropriate recording forms (lists, graphs, reports).

ORGANIZING EFFECTIVE MEETINGS
The club is encouraged to spend time learning how to organize effective meetings, where the purpose and outcome of the meeting are clear and everyone can participate fully. Students can practice having a written agenda (posted for all to see) listing each topic to be discussed at the meeting. Each meeting should conclude with an action plan which includes a completion date and list of the persons who are responsible for each task to be accom-

<table>
<thead>
<tr>
<th>This activity can be infused into the following area of the Primary curriculum</th>
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<tbody>
<tr>
<td><strong>Grade 4 Social Studies</strong></td>
</tr>
<tr>
<td><strong>Unit 2; Term 2; Unit title: How We Affect the Environment As We Meet Our Economic Needs</strong></td>
</tr>
<tr>
<td><strong>Focus question 2:</strong> How can we preserve the environment while meeting our economic needs?</td>
</tr>
<tr>
<td><strong>Objective</strong></td>
</tr>
<tr>
<td>Pupils will:</td>
</tr>
<tr>
<td>♦ Develop a commitment towards stewardship of the environment</td>
</tr>
<tr>
<td><strong>Procedure/activity (Page 302)</strong></td>
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<tr>
<td>#7 Form an environment club for the care and protection of the school environment</td>
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</tbody>
</table>
Discuss the need to keep our environment clean. Involve the students by getting them to decorate the drums with slogans that promote putting trash in garbage cans. This will make the drums more appealing and encourage students to dispose of litter properly.

Litter wardens should be selected from each class. Environment club members may also become litter wardens. Litter wardens should wear badges or sashes and should decide how their duties are to be carried out. Litter wardens could inspect school grounds daily or weekly. They could grade areas of the school and report to assembly how well the school is doing. Litter wardens could give talks to the school on how much garbage the school is producing. Litter wardens must not simply pick up litter, but must observe students littering and take steps to encourage them not to do so.

The function and importance of these wardens should be properly explained to the student body and to parents to ensure the work of these students is valued and supported.

**Objectives:**

Students will
1. Demonstrate proper waste handling
2. Demonstrate a sense of responsibility for their environment
3. Discuss the topic “Garbage is everybody’s problem”
4. Keep their surrounding clean

See page 27 in the Garbage Management section for guidelines for implementing a litter warden programme.
The environment club could identify an issue of importance to the school and surrounding area. Examples are: a land use issue (such as deforestation, industrial development or large scale agriculture), a pollution issue (such as bauxite processing, a factory operation, or a burning dump), a marine issue (such as dying coral reefs, beach erosion or over-fishing), a human health issue (such as solid waste disposal or sewage treatment), a water issue (such as flooding, water shortage, water conservation or the water cycle), an energy issue (such as solar and wind energy or the environmental effects of fossil fuel energy). You are not limited to these examples.

The students should research the issue and perhaps consider a field trip, if appropriate. They should thoroughly understand the issue and consider solutions. Environment club students could also ask an informed speaker to make a presentation to the club.

Having gathered the necessary information, students should brainstorm some possible solutions.

Students should then design their presentation to the assembly meeting. Bear in mind that one person speaking is the least interesting way of presenting information. Students should consider a visual presentation using slides or a video if possible, or they could write skits, songs, poetry or short drama presentations and perform them for the school.

**Objectives:**

**Students will**

1. Explore environmental issues
2. Inform the wider school community about those issues
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:

- Examine local/national/global environmental problems (pesticides, smog, deforestation, industrial and domestic waste, endangered species, noise pollution, misuse of water resources, CFCs, green-house effect, acid rain)

**Procedure/activity (Page 367)**

#4 As a class, discuss, plan and design, then create a presentation for a wider audience (e.g. school or community) on a selected aspect of the environment.
**ACTIVITY: COLLABORATION WITH OTHER SCHOOL CLUBS**

**Objectives:**

Students will:
1. Work with other groups, to develop synergies among school clubs
2. Inform other school clubs about environmental issues

If your school has other clubs, such as a 4H Club, a Key Club, a Science Club, Cubs, Scouts, Guides or Brownies, meet with their members to inform them of planned environmental club activities. Try to get them involved with your plans. Ask for their input into the activities you intend to carry out.

- The 4H club may already be doing a gardening project or keeping animals. It is easier for the environment club to try to influence them to address environmental concerns than to start a new garden. Students should consider issues such as soil conservation, water conservation, organic gardening, safe use of fertilizers and pesticides.
- If the 4H club is resistant to doing the whole garden organically, suggest a small plot. Compare the results of both types of gardening.
- If the 4H club is keeping animals, you need to discuss with them how the animals are going to be kept away from your garden.
- You can use animal manure for your compost heap and as fertilizer for your garden.
- Key clubs can be involved in clean-ups, poster competitions, tree planting, walk-a-thons, Trash-a-thons, and recycling.
- Science clubs can be involved in research.

Scouts, Guides, Cubs and Brownies can work for environmental badges and be involved in a range of activities.
ACTIVITY: ADVOCACY CAMPAIGN ON AN ISSUE OF IMPORTANCE TO THE COMMUNITY

Objectives:
Students will:
1. Describe and explain the environmental issues which affect their community
2. Take steps to deal with such issues
3. State the functions of government in dealing with environmental issues

Select the issue that students are interested in. This can be done after the first few meetings as it is often already a concern. Some possible ideas are:

- **Deforestation**: caused by coal burning, housing, logging, agriculture, forest fires.
- **Marine issues**: such as dying coral reefs, water pollution, over-fishing, beach erosion, effects of tourism on local people.
- **Pollution issues**: such as bauxite processing, burning, factory operations, garbage dump management, sewage treatment, gully cleaning.
- **Land use issues**: such as squatting, large scale agriculture, housing.
- **Solid waste management**: particularly relating to vendors near the school or other local issues.
- **Water issues**: such as flooding, water shortages, water quality, declining rainfall, streams drying up, pollution of sources of underground water.

This list is not exhaustive. You can select any other issue of concern to students and the community at large.

Students should research the issue they have chosen. Divide students into groups:
- those who will do library research
- those who will talk to community members affected by the issue
- those who will talk to those causing the problem
- those who will find out the relevant government department which should deal with the particular issue

Consider a field trip for students to see the problem themselves, if that is applicable. Then have a meeting for students to share their findings.

- Design the advocacy campaign
- Decide what kind of media will be used: press, radio or TV
- Consider a petition or letter-writing campaign, or possibly calling a talk show.
- Write directly to the government agency involved and the factory or farm or housing development office.
- Follow up with letters.

A meeting with a key person may also be possible. Private sector leaders can be influenced by a group of well-informed students. Doing your homework is very important, though, because polluters often have their own information to show that they are not polluting. It is not necessary to be confrontational, just firm. If the company or government agency has a solution in progress, ask for the time frame for completion and follow them up.

Document your advocacy programme. Keep your research, campaign plan and copies of your letters and any replies you receive.
BACKGROUND INFORMATION LINK
∞ How to conduct an advocacy campaign

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

**Grade 3**

**Term 3; Unit 2; Unit title: Caring For My Environment**

**Focus question 3:** How can I persuade others to care for the environment?

**Objective**

Pupils will:

♦ Create and depict ways of influencing others to appreciate the importance of proper use and management of the environment

**Procedure/activity (Page 288)**

#1c Write letters to a newspaper editor or friends encouraging others to care for the environment

#2 Create sketches for a poster with a message advocating care for the environment

**Grade 8 Social Studies**

**Unit 3: Using Our Resources and Related Environmental Matters**

**Subtopic C: Mining & Manufacturing**

**Specific learning outcomes**

**Knowledge**

Students should be able to:

8 Assess the impact of mining and manufacturing on the environment

9 Discuss attempts at conservation/preservation by mining and manufacturing industries in Jamaica

**Attitudes**

Students should:

3 Show commitment to preservation of the physical environment

**Content**

5 Pollution inherent in these activities and measures for environmental protection

6 Sources of energy used for these industries and how these impact on the environment

**Learning activities Page 80)**

8 Inviting a resource person from NEPA or a local environmental group to discuss pollution occasioned by industrialisation

9 Collecting newspaper articles /cartoons on the subject of pollution and discussing in groups some solutions to the problems associated with pollution

10 Designing a poster to alert residents in a community of the dangers of industrial pollution

**Advanced learning activity**

1 Writing letters to the editor of a newspaper to suggest possible solutions to the pollution problem
ACTIVITY: MAKE POSTERS TO PUT AROUND THE SCHOOL

Objectives:
Students will:
1. Visualize the problem or issue
2. Use their artistic skills
3. Inform the general school population on environmental issues
4. Make posters to disseminate environmental information

Consider involving the art and craft teacher in this activity. You could have a main focus for the posters or you could have groups making posters on different environmental issues. You could organize a competition for the best posters.

Students from all grades can participate in this activity. Members of the environment club could visit all classrooms and encourage students to make posters.

Some students could work on posters showing the problems. Others could do posters showing solutions. It is very important not to remain completely focused on the problem. We have to understand the problem before we can take corrective action, but we must also visualize how we would like things to be. Have students dream about how they would like their school and community to look.

Consider reusing waste materials in the posters. If this is a popular activity, do new ones often. Consider mounting a display of the best posters on an open day or in the library.
This activity can be infused into the following areas of the Primary and ROSE curricula

**Grade 2**

Term 3; Unit 1; Unit title: This Is My Community

Focus question 3: Who are the people in my community

Objective
Pupils will:
♦ Tell ways they can take care of home/school and the things in these places

Procedure/activity (Page 156)
#9 Create a poster to show ways of protecting the environment

**Grade 4 Social Studies**

Term 2; Unit 2; Unit title: How We Affect the Environment As We Meet Our Economic Needs

Focus question 2: How can we preserve the environment while meeting our economic needs?

Objective
Pupils will:
♦ Describe ways in which they can minimize/prevent environmental damage in their home, school and community

Procedure/activities (Page 302)
#5 In groups develop cartoons illustrating how each of the following community problems which the residents identified could be corrected
   A. Factory emitting smoke and soot ad discharging waste in the nearby sea or river
   B. Farmer using chemicals and fertilizer heavily on crops or rearing animals and not carefully disposing of their waste
   C. Mining establishment creating dust, destroying vegetation, making noise (24 hours) daily
   D. Coal burning activity creating smoke

#6 Display cartoons for the rest of the school to see

**Grade 5 Social Studies**

Term 2; Unit 2; Unit title: Resources Of The Caribbean

Focus question 2: How can the use of Caribbean resources be protected?

Objective
Pupils will:
♦ Present information in graphic form

Procedure/activity (Page 273)
#6b Design posters to inform others about the value of our wetlands and forests (e.g. as tourist attractions and habitats for rare species of wildlife) as well as alert them to the dangers of their abuse and what can be done to preserve them. Mount posters in strategic locations in the school/community

**Grade 6 Visual Arts**

Term 2; unit 1; Unit title: Words, Images and Messages

Focus question 2: How can I use words and images to convey messages?

Objective
Pupils will:
♦ Develop an information concept using visual images

Procedure/activities (Page 291)
#2d Identify a message that addresses a topical issue within the school community
   2f Develop a poster design from selected images
   #3c Determine wording necessary to be added to poster designs
ACTIVITY: CAMPUS, BEACH, ROAD-SIDE OR GULLY CLEAN-UP

Objectives:
Students will:
1. Estimate the scale of the garbage problem in Jamaica
2. Describe solutions
3. Discuss/Explain why garbage disposal is a community issue
4. Take action
5. Carry out hands-on activities
6. Involve other members of the community in problem solving and environmental activities.

CAMPUS CLEAN-UPS
First, assess the nature of the problem.

- Why is the school campus dirty?
- Is garbage thrown on the ground only in certain areas, such as the canteen?
- Is there waste left over from a construction activity?
- Is there a pile of broken school furniture?
- Is the area to be cleaned an old garbage dump?
- Is there a problem because there are not enough garbage drums, or are the drums not put in the right place, or not emptied regularly enough?
- Is garbage collection from the school regular?
- Is the school simply producing too much garbage to be handled effectively?

- Are students aware of how to dispose of their waste properly?

Involve ground staff in your discussion of the problem.

You should make plans to address whatever problems are discovered before your clean-up. If you don't do this, you will do a lot of hard work, clean up the campus and then in a very few weeks, it will be dirty again. The only exception to this is a pile of construction or other waste which has been around for a long time. When you have decided what is to be done about the problem and identified the solution, then you can tackle your campus clean-up.

- You will need garbage bags, gloves and masks for student volunteers. See if a parent can donate these, or ask Recycle for Life for help (See contact information in the resource list in the background information section of the manual).
- If the waste is not suitable for garbage bags, such as construction waste, you will need a front-end loader and a truck to take it away.
- You may need a truck or open back van to take away your garbage in any case. Or you could call the local Parks and Markets organization in your area and ask them to send a truck to collect your waste at the end of the clean-up day.
- You will need to ensure that the school has enough garbage drums. Punch holes in the bottom to prevent them from being stolen.
• Part of your clean up should be providing information on how and why to dispose of garbage.

Invite parents and community members to participate. Think about providing food and drink, picking up garbage is hot, thirsty, tiring work!

Consider transforming an old garbage dump into a garden. There is nothing more satisfying. Consider having some students paint the garbage drums with designs or environmental messages to make them attractive.

End your campus clean-up with a little celebration. Try to take photographs, showing "before", and "after". Make sure students wash their hands after they have finished picking up garbage and before eating and drinking.

BEACH CLEAN UP
This is more of a challenge than a campus clean-up because typically, many other people use our beaches.

• Start with a visit to the beach to assess the size of the problem.
• Where is the garbage coming from?

• Is it brought by those who use the beach? You will have to consider ways of educating them and involving them in your clean up.
• Is it washed up by the sea? This is a long-term international, public education issue, and the most you can do is probably to pick up this kind of beach debris.
• Is the beach a working beach, such as a fishing beach? You will have to talk to the fishermen and vendors on the beach.
• Is there large-scale illegal dumping taking place? Rather than try to clean up such a beach, you might want to consider using the illegal dumping as your advocacy issue.

The cardinal rule about a beach clean-up is to speak to and involve those who use the beach.

If the beach clean-up seems manageable, proceed as with the campus clean-up.

• You will need garbage drums (preventing them from being stolen is a real challenge), garbage bags, gloves, gravel rakes (not fan rakes), and dust masks.

A beach clean-up is more of a challenge than a campus clean-up because typically, many other people use our beaches.
Category 3: Environment Club

- Arrange for collection of the garbage from a reputable firm, such as the Parks and Markets organizations.

Consider joining one of the organized beach clean ups on International Coastal Clean-Up Day on the third Saturday in September each year.

Again, involve parents and community leaders. Take photographs “before” and “after”. Celebrate your efforts!

GULLY CLEAN UPS
This is the most difficult of all clean ups, because gullies are often not very accessible. Also, the type of garbage in a gully is often very noxious, and may not be possible for students to handle. (Dead dogs, for example).

- Students can visit a gully, observe and record the health and other effects of disposal of garbage in gullies.
- A gully clean-up may be possible in a very small gully, or if your school has significant resources at its disposal.

However, gully clean ups can be depressing, because the next rain will almost certainly bring more garbage from another community. You can use this as an opportunity to raise awareness of waste disposal issues.

OPEN LAND CLEAN UPS
Often there are areas of open land in communities which are used as garbage dumps. You could plan your clean up in such an area.

- Collaborate with people who live in the area.
- Consider turning the land into a pocket park, something very simple with grass, a few trees and a bench or two. This is a very satisfying project to do, which could transform our communities without expending a lot of resources.

RIVER AND CANAL CLEAN UPS
Schools are sometimes located along river banks or canals. Again, study the river or canal to see what the problem is.

- Sometimes vendors are throwing waste into the river, sometimes houses along the river are putting their sewage into the water, sometimes the waste is washed down into the river or canal from other sources.
- Because a river or canal is a moving source of water, it is not very easy to clean up, as more waste keeps arriving.

Consider a public education campaign for the people along the banks of the river or canal. Students can also clean up the river banks, if the garbage has washed high up.

Talk to community members about washing clothes in rivers.

Most detergents contain phosphates which encourage plant growth in the river. This can lead to the river becoming choked with vegetation and the oxygen in the river being depleted. If this happens, fish will die.

Encourage people who wash in the river to collect water from the river in a wash basin and then throw the dirty water on plants away from the river. Talk to community members about how pollution in the river affects everyone downstream.

For a canal, consider whether there is a health
OTHER ACTIVITY IDEAS

OPEN DAY FOR PARENTS ON ENVIRONMENTAL ISSUES

Objectives:
Students will:
1. Showcase their work
2. Discuss environmental issues with parents and community members

Schools are often experienced at having Open Days which can be done in a variety of ways. Some schools have one theme for the open day, others have a different theme for each class. Displays can be set up in a library or in each classroom, or a combination of both. Open Days can include posters, models, recycling displays, tours of the garden and nature walks, presentation of skits, songs, poetry and drama. Open Day can be scheduled for the day of the Judges' visit as well.

Students must be trained to be guides on Open Day. They must be able to explain what they have done and why.

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

Grade 6 Social Studies
Term 1; Unit 3; Unit title: Using Earth's Natural Resources

Objectives
Pupils will:
♦ Discuss the effects of population growth on earth's resources
♦ Discuss the effects of the misuse of resources and its impact on the environment (e.g. depletion of the ozone layer, acid rain, destruction of natural habitat)
♦ Discuss the importance of proper management of earth's natural resources

Procedures/activities (Page 154)
#5 Observe ways in which resources are used in home, school and community. Make suggestions for more efficient and careful use and in groups do illustrated flyers to encourage careful use of resources in the home and community
#6 Plan a project for Earth Day and implement this at the appropriate time
ESSAY OR POETRY COMPETITION WITH AN ENVIRONMENTAL THEME

Objectives:
Students will:
1. Write about environmental issues
2. Educate the general school community
3. Demonstrate creativity in making posters

Select the environmental theme and make posters announcing the poetry or essay competition. It would be a good idea to involve the English or Literature teacher. Develop the guidelines, such as the length of the entries. Decide on a deadline date and prizes. Choose judges. Announce the competition at assembly. After the winners have been selected, have a prize-giving ceremony at assembly. Have the winning entries read out. Submit the winning entries to a newspaper.

DEVELOP AND PERFORM ENVIRONMENTAL SKITS, SONGS, POETRY, DRAMA, DANCE

Objectives:
Students will:
1. Create audio-visual demonstrations of environmental issues
2. Educate the general school and wider community
3. Present environmental issues in a way that is relevant and exciting to them

This is an activity that can work well with a drama or music club.

Have students pick the issue they want to high light. Divide students into groups to do research and then report to the entire group. Have the students write the dialogue for skits, the lyrics for songs and the poems. Poetry can be done in literature classes. Consider having costumes, which could be made from waste material, such as paper, scandal bags, scraps of cloth etc. Use music as much as possible. It is best not to make your presentations too long. Remember, if your school goes through to regional and or national judging, the judges will only have one an hour to see everything. Try to keep presentations for the judges under 20 minutes. Presentations can also be performed at assembly or open days.
This activity can be infused into the following areas of the Primary curriculum.

**Grade 3**

**Term 3: Unit 2; Unit title: Caring For My Environment**

**Focus question 2:** Why and how should we care for the environment?

**Objective**

Pupils will:

♦ Explain why it is now most urgent to protect the physical environment

**Procedures/activities (Pages 286—287)**

#6 Create a dance depicting the difference between a polluted and clean environment

#7 Working in groups use a rhythmic pattern to make up a dub poem or rap to show what they have learnt about care of the environment

**Focus Question 3:** How can I persuade others to care for the environment?

**Objective**

Pupils will:

♦ Create and depict ways of influencing others to appreciate the importance of proper use and management of the environment

**Procedure/activity (Page 289)**

#4 Using words relating to the care of the environment, create a song and then perform it

**Grade 4 Language Arts**

**Term 3: Unit 1; Unit title: How Do We Find Out and Tell About Storage, Pollution and Purification of Water?**

**Objective**

Pupils will:

♦ Write completely different kinds of creative pieces

**Procedure/activity (Page 339)**

#1 Act out a scene in which persons are washing in a stream, while a public health worker is trying to convince them about the harmful effects of this practice

**Grade 6 Music**

**Term 1: Unit 2; Unit title: Music In Everyday Life**

**Focus question 3:** How do I select and sequence sounds to create songs and accompaniments reflecting different styles, moods and structures?

**Objective**

Pupils will:

♦ Manipulate the elements of music to create songs relating to everyday life

**Procedures/activities (Page 74)**

#1 Make up suitable lyrics (texts) for selected melodies and vice versa

#4 Critique and improve the rehearsal of their composition in preparation for a performance/recording

**Grade 7 Science**

**Unit 3: Living Things and How They Reproduce**

**3.1 Gross Structure of Flowering Plants**

**Specific objectives**

Students should be able to:

6 Suggest ways in which plants are important to the environment
Category 3: Environment Club

Suggested student activity

3 Following a discussion on the importance of plants to the environment and various industrial sectors ask students to write a poem, song or essay on this topic

BEE KEEPING IN COLLABORATION WITH A 4H CLUB OR AGRICULTURAL PROGRAMME

Objectives:

Students will:
1. Explain the importance of bees
2. Describe their role in pollination
3. Set up bee hives to generate sustainable income for the school
4. Plan and implement an income generating programme

For information on bee-keeping contact Decton Hylton at International School of Jamaica or the Jamaica Bee Keepers Association (See Resource list in the background information section of the manual).

ORGANISE A TRASH-A-THON

Objectives:

Students will:
1. Organise and implement a fundraising activity for the school or environment club
2. Clean up an area
3. Explain/Discuss why garbage is a community issue.

Select the area to be cleaned up. It could be on the campus or in the community. Decide how the amount of trash collected is to be measured. An easy way is number of garbage bags. Make up sponsorship sheets. Give to students, who will seek sponsors for the number of garbage bags they collect.

BACKGROUND INFORMATION LINKS
∞ How take environmental action
∞ Valuing trash to secure cash
ORGANIZE AN ENVIRONMENTAL FIELD TRIP

Objectives:
Students will:
1. Identify and describe an environmental problem
2. Explain the effects of the environmental problem
3. Identify and describe actions that they can take to address the problem
4. Plan and undertake a field trip to get an upclose look at the problem

Plan where your field trip will take place. Some suggestions:
• A local garbage dump
• A local industry that is causing an environmental problem
• A local protected area, river, wetland, forest, beach
• Mason River Reserve, Clarendon (Contact the Institute of Jamaica)
• Montego Bay Marine Park (Contact Montego Bay Marine Park)
• Negril Marine Park (Contact Negril Coral Reef Preservation Society)
• Blue and John Crown Mountains (contact Jamaica Conservation and Development Trust – JCDT)
• Hollywell and Oatley Mountain Trail (contact JCDT)
• Rio Grande Valley Hikes (contact Valley Hikes)

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

Grade 2
Term 3; Unit 2; Unit title: Places of Interest In My Community
Focus question 1: What are the places in our community that we find interesting?

Objectives
Pupils will:
♦ Write with feeling to record personal experiences and observations
♦ Discuss the changes they would like to see in their environment
♦ Record observations about their home, school and community

Procedures/activities (Page 163)
#10 Discuss interesting natural features of the community which may include:
- river, pond, waterfall, spring
- garden, wetland/swamp, woodland
- cave, hill, rocky outcrop, cliff, beach
Visit these, where possible, highlight the important features and compile a brochure to encourage people to visit the community to see these places.
#11 List ways in which they can enhance or keep a place of interest pleasant to visit (e.g. disposing of garbage, not writing on walls, not breaking artifacts/monuments)
Objectives:
Students will:
1. Identify the elements of good environmental citizenship
2. Inform the wider school community about environmental issues
3. Identify methods of gaining support of students and teachers in the school to be good environmental citizens.

Decide what elements are to go into the pledge.
- How do people affect the environment?
- How can they make their effects on the environment less harmful?
- Divide the pledge into commitments from students, teachers and parents.
- Ask students to write the kind of pledge they would like and then pick the best one, or you may combine elements of more than one.

Get the pledge typed on a computer, or put on posters. Encourage teachers, students and parents to sign it. Ask that the environmental pledge be read at assembly.
CATEGORY 4
ENVIRONMENTAL RESEARCH
Objective: To provide students with opportunities to learn about environmental issues relevant to Jamaica, particularly local issues. To introduce students to the techniques of conducting research.

Students must develop an understanding of the nature of the problem and identify environmental and health risks. They must establish whether the harmful consequences occur in the short or long term. They must consider effective alternatives, identify obstacles to implementing successful solutions, and suggest ways in which these obstacles can be overcome.

**CASE STUDY: WEST INDIES COLLEGE PREP**

This school decided to do an environmental research project on a local pond in Williamsfield, Manchester. This pond was being used as a dumping site by the community. Garbage from the road had washed into the pond including tyres, plastic bottles, old paint tins, candy wrappers and juice boxes. The children studied the pond and informed the community about the effect of pollution of the pond on their lives.

They approached the research by initially observing the pond and taking notes of what they saw, for example, “beautiful water lilies, garbage, fish, frogs and animals”.

After this research, students learned that when the pond is used for disposal of garbage, the amount of algae in the pond is increased. The algae uses up the oxygen that the fish need and consequently, they die. Having learnt how garbage can destroy water creatures, the students later went back to the community to educate the residents about how to care for the pond. They also made a model of the pond and the surrounding community, drew pond creatures they had seen under the microscope and prepared a display of their research project.
ACTIVITY: OBSERVING ANIMALS ON THE SCHOOL GROUNDS

Objectives: Students will:
1. Explain the importance of animals in maintaining healthy ecosystems
2. Demonstrate respect and care for animals
3. Identify animals on the school compound, their habits, what they eat and where they live
4. Make a chart or map of school animals.
5. Map the animals on the school property.
6. Divide the students into teams of 3 or 4.
7. Ask each team to sit quietly around a small plot of land and, without talking, look carefully around them.
8. They should observe all the different types of living things they find and record their behaviour and how they exist in their habitats. Students should also note the non-living things in the habitats that they are studying. Livings things could include plants, insects, bees, lizards, frogs, moths, butterflies and birds. It may also include larger animals like dogs, cats or goats.
9. After 15 or 20 minutes, ask the teams to discuss how many living things they found, and how each one was related to the others as well as to the non-living things observed.
10. Teams then come together and make a map or poster of all the living things observed.

RELATED ACTIVITIES: THE WEB OF LIFE
Teachers are asked to help students experience the web of life, the way that everything is related to and dependent on other things. Organize a web of life activity. (See directions in background information section of the manual)

ATTRACTING BIRDS TO THE SCHOOL GROUNDS.
Read about the birds of Jamaica and make some bird feeders to attract birds to your school yard. (This can be part of your reuse project). You can make seed feeders or nectar feeders. Be sure to clean the feeders occasionally and always keep them far away from cats.

BACKGROUND INFORMATION LINKS
∞ Birds of Jamaica
∞ Backyard naturalist
∞ Everything in life is connected (the web of life game)
**Grade 3**

**Term 3; Unit 1; Unit title: Living and Non-Living Things In My Environment**

**Focus question 2:** Why do living things need special habitats?

**Objective**

Pupils will:

♦ Collect and record attribute data relating to observation of living things that live in different habitats

**Procedure/activity (Page 275)**

#2 Go on a field trip (nature walk) and count animals found on vegetation. Tally numbers of different types of animals and record where found (on tree, grass, shrub etc). Discuss why particular animals are found in specific locations and write brief narrative using SJE (1-3 paragraphs) on why a particular location was beneficial to the named animal.
ACTIVITY: JAMAICA'S WILDLIFE: ENDANGERED OR EXTINCT ANIMALS

Objectives:
Students will:
1. Identify endangered species, especially Jamaican ones, and their habitats
2. Explain the interconnection between living things
3. Discuss the importance of habitat protection
4. Demonstrate respect for all life.

Students' research could focus on the following:

- Researching one endangered Jamaican animal, such as the coney, swallowtail butterfly, or manatee.
- Observing birds and other animals around the school, and recording where they live, their habitats, their habits, food sources, predators, and what it is that threatens them.
- Choosing an endangered animal for your school to “adopt” and learn everything you can about it.
- Researching the importance of habitats to the survival of this animal, the reasons for the destruction of the habitats and possible solutions.
- Designing an educational campaign to persuade other people to protect this animal.

BACKGROUND INFORMATION LINKS
- Birds of Jamaica
- Notes on the Natural History of Jamaica


**Category 4: Environmental Research**

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

**Grade 5 Language Arts**

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

**Focus question 1: what can I say about plants and animals in Jamaica?**

**Objective**

Pupils will:

♦ Follow arguments and draw conclusions

**Procedure/activity (Page 305)**

#6 Discuss as a class the animals that are becoming less popular in Jamaica and the reasons for this

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**WETLANDS**

**Objectives:**

**Students will:**

1. Explain the importance of wetlands
2. Identify the major wetland areas in Jamaica
3. Identify the threats to wetlands
4. Describe the results of wetland destruction
5. Describe the situation in Jamaica
6. Identify the ways wetlands can be protected

Students' research should focus on the following:-

- What wetlands are and where they are found
- Why they are important: their roles as land builders, land protectors, nurseries for marine life, habitat for birds
- The threats to wetlands, particularly in Jamaica
- How wetlands can be protected
- Reference to a threatened wetland in Jamaica

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

**Grade 8 Social Studies**

**Unit 1: Jamaica: Physical Resources**

**Subtopic B: Climate and Vegetation**

**Specific Learning Outcomes Knowledge**

Students should be able to:

4. Describe how climate and physical features interact to determine the natural vegetation cover

**Content**

4. Vegetation types associated with different physical regions of Jamaica
6. Preventative relief measures and institutions to cope with natural disaster and environmental degradation
Category 4: Environmental Research

ENVIRONMENTAL EFFECTS OF FOSSIL FUEL BASED ENERGY

Objectives:
Students will:
1. Describe fossil fuels
2. Explain the importance of fossil fuels in development
3. Identify and explain the environmental costs of using them
4. Identify ways the environmental effects can be reduced
5. Describe the relationship between fossil fuel use and climate damage

Students' research should focus on the following:
- What fossil fuels are
- How and when they were created
- How we use them as fuel
- Which ones we use in Jamaica
- What the environmental effects are on air, water, soil, the sea, humans
- How harmful environmental effects can be prevented
- Which harmful environmental effects are being experienced in Jamaica
- The links between fossil fuel use and climate change
- Recommendations for solutions

BACKGROUND INFORMATION LINKS
∞ Booklet-Energy, Water and the Environment

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

Grade 3
Term 3; Unit 2; Unit title: Caring For My Environment
Focus question 2: Why and how should we care for our environment?
Objectives
Pupils will:
♦ Explain why it is now most urgent to protect the physical environment
♦ Discuss and practice conservation of resources e.g. water and electricity
Procedure/activity (Page 287)
#8 Examine examples of global environmental concerns e.g. disappearing forests and wildlife, rise in infectious disease due to depletion of the ozone layer and the "greenhouse" effect. Create a list of actions that each person can take to prevent further damage
**ALTERNATIVE SOURCES OF ENERGY**

**Objectives:**

**Student will:**

1. Define the term 'alternative energy'
2. Explain its importance to a developing country such as Jamaica and to the world
3. Describe the environmental benefits of alternative sources of energy as well as the disadvantages

- Places in Jamaica where wind and solar energy are being used
- Benefits of using wind and solar energy
- Advantages and disadvantages of using current sources of energy such as fossil fuels and charcoal
- Ways in which Jamaica could use more alternative sources of energy

Students' research should focus on the following:-

- **What is meant by alternative sources of energy**

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

**Grade 7 Science**

**Unit 5: Energy**

**5.1 Forms of energy and energy conversions**

**Specific objectives**

Students should be able to:

1. State what is meant by energy
2. Describe complex systems in which energy conversions occur e.g. windmill, waterwheel, biogas generator, and electricity generator (fuel fired, solar or running water)
3. Distinguish between different types of energy sources and classify these as renewable and non-renewable

**Suggested student activities (Page 56)**

5. Have students classify a given list of energy sources as renewable and non-renewable, following a discussion on the terms: renewable and non-renewable

**5.2 The sun as the source of energy**

**Specific objectives**

Students should be able to:

1. List and discuss some other uses of the sun's energy

**Suggested student activities**

1. Make a collage to illustrate some uses of solar energy, for example, a solar water heating panel on a roof and drying coffee, fish or tobacco and make suitable notes

**Science and technology project:**

Make a model to demonstrate a use of solar energy e.g. for heating, drying, cooking. Try to design a biogas generator for your school and make a proposal to your principal
Objective:
Students will:
1. Discuss why it is important to conserve energy and how this can be achieved

Students’ research should focus on the following:
• What is energy
• Sources of energy—renewable and non-renewable
• Why energy conservation is important

- The situation in Jamaica - attitudes to energy
- How energy can be conserved
- Research could be divided into the home, school, business, school
- Students could do research on how proper building design can reduce demand for energy.

BACKGROUND INFORMATION LINKS
∞ Booklet-Energy, Water and the Environment

Turn lights off when not in use
Replace incandescent light bulbs with fluorescent bulbs
Install low-flow shower heads
Plan trips wisely—conserve on gas

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

**Grade 7 Science**

**Unit 5: Energy**

**5.4 Energy conservation in the home and community**

**Specific objective**

Students should be able to identify several ways in which energy use can be reduced in the home e.g. in the kitchen, and bathroom

**Suggested student activities (Page 60)**

2 Engage students in a discussion on the energy savings that could be made by more efficient use of appliances related to cooking, washing, ironing, lighting and cooling. Allow students to record the main ideas in their notebooks.
3 Working in groups challenge students to produce an advertisement for television or radio promoting energy savings in the home
4 Encourage students to log individual activities at home for a week to indicate if they are practising responsible energy conservation measures e.g. turning off lights, reducing unnecessary opening of the refrigerator

**Grade 8 Resource and Technology**

**Module: Industrial techniques**

**General objective 1** Exploring and utilizing resources

1.1 (Page 206)

**Topics/Content outline**

E Energy

(iii) Energy conservation

**Expected outcomes and skills**

- Identifying ways of conserving energy

**Suggested activity**

- Research conservation measures
Category 4: Environmental Research

DEFORESTATION

Objectives:

Students will:
1. State the causes of deforestation
2. Explain the effects of deforestation
3. Identify the solution to the problem
4. Describe the situation in Jamaica,

Students' research should focus on the following:

- the uses of trees by humans
- the relationship between trees and rainfall as well as the importance of trees to climate, temperature and animals
- the causes and consequences of deforestation
- possible solutions
- steps to improve the situation in Jamaica

BACKGROUND INFORMATION LINKS

∞ Trees-Trees are our friends
∞ Forest Connections: The forest in your classroom (Jamaica's forests: Providers and protectors; Forest connections: key concepts; Forests in our lives: Gifts from trees; Forests in the rain)
∞ How to recycle paper

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

Grade 5 Science

Term 1; Unit 1; Unit title: Weather and Climate
Focus question 2: How do my actions affect the weather?

Objective
Pupils will:
♦ State some ways in which human actions negatively influence weather and climate (Greenhouse effect, acid rain, depletion of trees, soil erosion)

Procedure/activity (Page 108)
#2 In groups research an environmental issue relating to climatic changes caused by human actions. Report to class using three-dimensional models, performance piece etc and including corrective behaviours/actions that humans should take
Grade 5 Social Studies
Term 2; Unit 2; Unit title: Resources Of The Caribbean
Focus Question 2: How can the use of Caribbean resources be protected?

Objectives
Pupils will:
♦ Discuss some ways in which the exploitation of resources affects the environment
♦ Discuss ways in which some resources are misused
♦ Assess the role of governments in protecting the resources of the region
♦ Define and use correctly the term “sustainable development”

Procedures/activities (Pages 271-274)
#3 From stimulus materials provided identify and discuss some of the ways our resources are misused e.g
- Poor farming practices
- Poor planning by governments of the region
- Cutting down of trees without replanting
- Squatting
#4 Brainstorm for reasons why we misuse resources. Where necessary include such reasons as:
- Lack of education about the value of these resources
- The non-enforcement of laws and regulations governing the use of these resources
- Ignorance of the long term effects of the abuse/misuse of the resources
- Lack of concern about the future
#5 In groups carry out research about how the following two resources are misused or abused in the region:
- Wetlands; -forests
Be sure to identify the reasons why they are misused, the ways in which they are misused and who misuses them. Include some of the short and long term effects of the misuse on our lives. Show how the long term use on a sustainable basis would better benefit the region as against continued abuse
#7a Invite resource persons e.g. from NEPA to talk about the laws in Jamaica and the extent to which these laws are being enforced
#8 In pairs/small groups/individually, produce a composition about how education and or law enforcement can help to promote the sustainable use of our natural resources in the region or the impact that the continued misuse/abuse of our resources will have on the quality of our lives in the region

Grade 6 Social Studies
Term 1; Unit 3; Unit title: Earth’s Natural Resources
Focus question 1: What are earth’s natural resources?

Objectives
Pupils will:
♦ Define and use correctly the following concepts: ecosystem, renewable, sustainable, greenhouse effect, natural vegetation
♦ Explain the importance of forests in the environment

Procedures/activities (Page 151)
#13 Go on a walking tour of the community to observe plants that grow in the area:
- List those planted by people and those that grow naturally
- Make distinction between natural vegetation and cultivated vegetation
#14 Listen to resource person from the Forestry Department outlining the importance of forests in the environment (e.g. as habitat, as part of the ecosystem). Ask questions of resource person for additional information and for clarification.

Focus question 2: How do we use earth's natural resources?

Objectives
Pupils will:
♦ Discuss the effects of population growth on earth's resources
♦ Discuss the effects of misuse of resources and its impact on the environment (e.g. depletion of the ozone layer, acid rain, destruction of natural habitat)
♦ Discuss the importance of proper management of earth's natural resources
♦ Appreciate the importance of resources

Procedures/activities (Page 153)
#1 Read texts, magazine and newspaper articles and access internet sources for information on the depletion of forest resources and the effects of population growth on land resources. Write a paragraph on each one.
#2 In groups discuss the consequences of the depletion of the world's forest resources and the need for corrective measures.
#3 Write articles for the environmental column of the children's newspaper suggesting possible long term global effects of the mismanagement of the earth's resources.
#6 Plan a project for Earth Day and implement this at the appropriate time.

Grade 8 Social studies
Unit 1: Jamaica: Physical Resources
Subtopic B: Climate and vegetation
Specific learning outcomes
Knowledge
Students should be able to:
5 Describe how human activity has modified the natural vegetation cover in specific areas in Jamaica

Attitude
Students should:
1 Appreciate what they need to do to protect the environment

Content
4 Vegetation types associated with different physical regions in Jamaica
5 Changes and disasters brought about in the Jamaican physical environment through natural causes and the activities of man
6 Preventative relief measures and institutions to cope with natural disaster and environmental degradation

Advanced learning activity (Page 65)
Conduct research in an area close to the school on how human activity has led to or has worsened the effects of a natural disaster.
Grade 8 Resource and Technology
Module: Agriculture And The Environment

General objective 4: Protecting and conserving resources in the environment

4.2 (Page 55)

Topic/Content outline
Conservation of forests
(a) watershed protection
(b) Habitat for wildlife
(c) Soil conservation
(d) Food production
(e) Timber production

Expected outcomes and skills
Students should:
- Develop an appreciation of the benefits of preserving forests
- Understand the importance of forests in maintaining ecological balance
- Know some common forest trees and their main uses

Suggested activities
- Research trees in the community and their various uses
- Develop plans for reducing the cutting of trees in the community

Grade 9 Science

Unit 18: More About The Earth’s Resources

18.3 Forests and wildlife and their conservation

Specific objectives
Students should be able to:
2. Explain the interdependence of forests and wildlife
3. Explain the importance of forests in maintaining watersheds
4. Explain the importance of preserving the indigenous species of plants and animals

Suggested student activities (Page 184):

Foundation
(2) Make a poster/chart showing the forest types and where they are found in Jamaica—dry limestone, wet limestone, lower montane, tropical/Caribbean rain forest and also pictures/diagrams showing some of the wildlife in each type of forest
(3) Discuss in small groups and report on why it is important to preserve the forests and the wildlife. If a film is available it would be good to show it also
(4) Identify some of the indigenous species found in Jamaica and give reasons why they should be conserved
(5) List conservation practices which help to preserve forests and their wildlife

Normative
Do research on protected forests in Jamaica and report to the class on the practices being carried out in these cases
Students’ research should focus on the following:

- Illustrate the water cycle and describe the processes at each stage
- The sources of fresh water, and percentage of fresh water on earth
- Importance of ground water
- Importance of the water cycle and the importance of trees to rainfall
- Different uses of water and the importance of conserving it
- How water is polluted, its effect on humans and other life forms
- The situation in Jamaica
- Possible solutions to water issues

Objectives:

Students will:
1. Illustrate the water cycle
2. State how water can be wasted and/or polluted
3. State ways in which water can be conserved
4. Describe the water supply situation in Jamaica
5. Identify solutions to water problems

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

Grade 3
Term 3; Unit 3; Unit title: Caring For My Environment
Focus question 2: Why and how should we care for our environment?
Objective
Pupils will:
- Discuss and practice conservation of resources e.g. water and electricity
Procedure/activity (Page 287)
#10 Construct with teacher assistance rating scale/checklist to rate student/teacher behaviour re care for the environment. Construct rubric and observe and rate their own as well as the behaviour of classmates over an agreed period

Grade 8 Science
Unit 12: The Resources—Air and Water
12.4 Conservation of Water
Specific objective
Students should list ways in which water can be conserved in the environment
Suggested student activities (Page 124)

1. Show students pictures of arid areas. Recall everyday uses of water and talk about how the lack of it could affect us.
2. Discuss what could happen if water ran out in an area which now has enough of it.
3. Talk about and record ways in which we could conserve water in the home and in the wider environment.
4. Make a poster telling how to conserve water.

SOIL EROSION

Objectives:

Students will:

1. Explain the importance of soil
2. Describe ways in which soils are formed
3. Identify and describe the different types of soil
4. Explain the importance of soil conservation
5. Explain the causes of soil erosion
6. Describe the situation in Jamaica

Students' research should focus on the following:

- The importance of soil
- The types of soil and which ones are easily eroded
- The types of soil in Jamaica
- The causes of soil erosion
- How soil erosion can be prevented
- Places in Jamaica where soil erosion is happening

BACKGROUND INFORMATION LINKS

- Forest Connections: The forest in your classroom (Forests in the rain)
- Notes on the Natural History of Jamaica-soils
This research can be infused into the following areas of the Primary and ROSE curricula

**Grade 4 Social studies**

**Term 2; Unit 2; Unit title: How We Affect The Environment As We Meet Our Economic Needs**

**Focus question 1:** How do we affect the environment as we meet our economic needs in (a) agriculture (b) tourism (c) mining (d) manufacturing (e) trade?

**Objective**

Pupils will:
- Discuss the effects of poor farming practices on the land

**Procedure/activity (Page 297)**

#17 Match colour coded cards about farming (prepared by teacher). Read each group of cards to see the relationship between certain farming practices and soil erosion and soil exhaustion

(a) Determine which one of the cards in each group states a consequence of activities described on the other cards in the group

(b) Which group of cards describes a good farmer

(c) Share experiences if similar farming practices they have observed

(d) Consider and discuss the effects of farming practices (good and bad) on people’s lives

**Grade 9 Science**

**Unit 18: More about the earth’s resources**

**18.2 Soil and soil conservation**

**Specific objectives**

Students should:

- Describe ways in which soil is lost
- List the ways in which soil may be conserved
- Explain the importance of conserving soil

**Suggested student activities (Page 182)**

- Provide groups of students with literature on different aspects of soil erosion. Have them list all the agents of erosion and say how they erode soil. Discuss erosion as a soil-forming process
- Discuss soil as a non-renewable resource. Explain why soil should be conserved. Compare this with rocks and minerals. Let students come up with the fact that soil should be conserved because it is formed from rocks and minerals which are non-renewable
AIR, LAND AND WATER POLLUTION

Objectives:
Students will:
1. Identify the different forms of air, land and water pollution
2. State how they affect people
3. Describe the solutions to pollution
4. Describe the situation in Jamaica

Students' research should focus on the following:
- the major causes of pollution on land, freshwater, air, and oceans, both in general and in Jamaica.

• The impact on humans and other life forms
• Possible solutions
• Obstacles to solutions
• Possible ways of overcoming these obstacles

BACKGROUND INFORMATION LINKS
- The water game
- Environment and Health
- Everything is connected (the web of life)

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

Grade 4 Science
Term 2; Unit 1; Unit title: Water
Focus question 3: How can I make water safe for drinking?

Objective
Pupils will:
♦ Identify sources of water pollution and ways of reducing their detrimental/harmful effects
♦ Participate in activities to reduce water pollution, with due regard to safety

Procedure/activity (Page 272)
#1 Investigate local instances of water pollution and suggest ways of reducing/eliminating these, as well as different methods for water purification. Go on a field trip/collect samples of water. Investigate for each sample-colour, odour, sediments, presence of organisms and make inferences about the purity of the water. Write a report on investigations
Term 2; Unit 2; Unit title: Air: Part Of Earth’s Atmosphere
Focus question 3: How can the air I breathe be unsafe?
Objectives
Pupils will:
♦ Identify sources of air pollution and ways of reducing their detrimental/harmful effects
♦ Plan and design a device for filtering air
Procedures/activities (Page 279)
#1a Work in groups to research air pollutants and their effects on the environment. Place emphasis on:
(a) sources of air pollution
(b) Preventative measures
Present their work to class and record work in written and illustrative forms
#2 Write the steps for making a device for filtering air. Make the device and test it

Grade 4 Social Studies
Term 2; Unit 2; Unit title: How We Affect The Environment As We Meet Our Economic Needs
Focus Question 1: How do we affect the environment as we meet our economic needs In a. agriculture b. tourism c. mining d. manufacturing e. trade
Objectives
Pupils will:
♦ Define and use correctly the following concepts: pollution, waste disposal, toxic waste
♦ Discuss the relationship between overpopulation and pollution of the environment
♦ Examine ways in which disposal of waste from mining and manufacturing affects the atmosphere
♦ Discuss how the disposal of waste from manufacturing, tourism and ships in port affects the sea
♦ Describe the activities in agriculture which pollute the land, gullies and rivers with toxic waste
Procedures/activities (Pages 293-296)
#4a Read story (supplied by teacher) or newspaper article about a family who is being affected by bauxite dust and emissions or discuss their own experiences with bauxite and dust emissions
4b. Name other sources of similar emissions in the air
4c. Discuss ways in which these emissions pollute the atmosphere and identify some of the effects they have on human activity (housing, health agriculture etc). Write findings in a paragraph
#5a In groups of five, research information on pollution. Each group will be responsible for one of the sectors: agriculture, manufacturing, mining, tourism and trade. Record on loose paper which will ultimately be collated into a booklet
#9 Respond to questions about the dangers posed by pesticides and talk about how they got the information
#10 With teacher’s help imagine a scenario where a farmer sprayed his cabbage field with pesticide and it rained heavily. the pesticide is washed into the gully, the water flows into the river and then into the sea. Say what would be the effects on the river and sea. Record the answers
#11 Consider what would be the effect if pesticide from 20 farms washed into the river and sea
#12 Listen to teacher explaining that because they are poisonous, pesticides and fertilizers are referred to as toxic waste
#13 Make deductions about the effect that oil spills, sewage, waste water from factories and laundries and toxic waste discharged into the sea have on marine life and on people
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:
♦ Examine local/national/global environmental problems (pesticides, smog, deforestation, industrial and domestic waste, endangered species, noise pollution, misuse of water resources, CFCs, green-house effect, acid rain)
♦ Explain how environmental problems (global, regional, national affect natural cycles
♦ Suggest solutions to environmental problems e.g. 3Rs: reduce/re-use/recycle
Procedures/activities (Pages 366-367)
#2 In groups research the harmful effects of industry, farming etc on the environment e.g pollution, disturbance/destruction of the natural environment/ecosystems, disposal of waste. Report on their findings in a variety of ways
#3 In groups or individually, research on preventative measures and solutions for the sustainable development of the environment. Display findings and give oral account of their work

Grade 8 Science
Unit 12 The Resources—Air and Water
12.5 Water and air pollution
Specific objectives
Students should be able to
(1) List ways in which man’s activities contribute to the pollution of water and air
(2) State the ways in which pollution of water and air can be minimised
Suggested student activities (Page 127)
(1) Brainstorm always in which the atmosphere and water may be polluted. List ideas on the board. Add any important ones which are left out. Have students record the information in their books
(2) Talk about the consequences of each type of pollution
(3) Try an air pollution investigation using an air particles collector (cardboard smeared with vaseline suspended outside)
(4) Make charts on how smog or acid rain is produced
(5) Discuss ways in which pollution may be reduced
(6) Have students write an essay or poem on water or air pollution
(7) Have students make a game on pollution
Science & technology project
Identify a source of pollution in the environment. Plan and design some method of controlling the pollution and try it out
Grade 8 Resource and Technology
Module: Home and Family
4.3 (Page 174)

Topics/Content outline
Effects of pollution on the environment
(a) Improper disposal of garbage
   (i) homes (ii) factories
(b) burning of trees and garbage
(c) washing in rivers and streams
(d) improper disposal of insecticides/chemicals and aerosol cans

Expected outcomes and skills
- Consider alternatives which will act as solutions towards preserving the environment

Suggested activities
- Group work and reporting on the effects of improper garbage disposal
**ENVIRONMENT AND HEALTH**

**Objectives:**
**Students will:**
1. Explain the importance of coral reefs and where they are found.
2. Identify the location of coral reefs in the waters around Jamaica.
3. Identify the threats to our coral reefs.
4. Explain the results of destruction of coral reefs.
5. Describe the situation in Jamaica.
6. Identify the ways in which coral reefs can be protected.

**Students' research should focus on the following:**
- The importance of the environment in sustaining human life.
- The effects of air, land, and water pollution on human health.
- Possible solutions to current pollution-related health problems in Jamaica.
- The role of the environment in supporting agriculture, healthy eating, and a lasting food supply.
- The role of the Public Health Department.

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**CORAL REEFS**

**Objectives:**
**Students will:**
1. Explain the importance of coral reefs.
2. Identify the location of coral reefs in the waters around Jamaica.
3. Identify the threats to our coral reefs.
4. Explain the results of destruction of coral reefs.
5. Describe the situation in Jamaica.
6. Identify the ways in which coral reefs can be protected.

**Students' research could focus on the following:**
- What coral reefs are and where they are found.
- Why they are important, their roles as homes for fish, feeding grounds for other fish, protection from storms, medical uses, tourism.
- The threats to coral reefs, particularly in Jamaica.
- The status of Jamaica’s reefs.
- How coral reefs can be protected.
- A threatened coral reef in Jamaica.
This activity can be infused into the following area of the ROSE curriculum

Grade 8 Social Studies
Unit 3: Using Our Resources and Related Environmental Matters
Subtopic B: Fishing

Specific learning outcomes
Knowledge
Students should be able to:
(2) Describe the conditions which contribute to rich marine life
(4) Discuss the exploitation and destruction of marine life and steps that must be taken to alleviate these
(5) Discuss a practise inimical to the fishing industry

Attitude
Students should:
(2) Show commitment to the preservation of the marine environment

Content
(4) Methods of fishing
(5) Factors affecting fishing and the main fishing grounds
(8) Problems of pollution of rivers and seas
(9) Methods of conservation practised

Learning activities (Page 76)
(6) Preparing posters for public displays which publicize important conservation rules e.g. closed seasons, limit on size of fish caught, use of chemicals, spear guns, dynamite

Advanced learning activity
(2) Writing articles to the newspaper protesting a practise inimical to the fishing industry which is taking place in the district/parish
TOURISM AND THE ENVIRONMENT

Objectives:
Students will:
1. Explain how tourism is dependent on the environment
2. Explain the importance of tourism to Jamaica's economy
3. State some of the negative effects that tourism has on the natural environment

Suggestions for students' focus are:
- Tourism's dependence on the environment
- Tourism's impact on the environment
- Importance of tourism to Jamaica's economy
- Jamaica's protected areas and national parks
- Ecotourism

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

Grade 8 Social Studies
Unit 3: Using our resources and related environmental matters
Subtopic D: Tourism

Specific learning outcomes
Knowledge
Students should be able to:
(5) Discuss the economic linkages which emanate from the tourist trade
(6) Discuss the advantages and disadvantages of the tourist trade to Jamaica
(8) Identify and discuss future developments in tourism e.g. ecotourism

Attitudes
Students should:
(2) Demonstrate commitment to the preservation of the cultural and physical environment

Content
(6) Impact of tourism on the country economically and culturally
(7) Impact of tourism on the environment
(9) Future of tourism in Jamaica—new resorts, new trends e.g. ecotourism, geriatric tourism and heritage tourism

Learning activities (Page 84)
(10)(ii) the advantages and disadvantages of tourism (iii) tourism of the future e.g. ecotourism, heritage tourism

Advanced learning activity
(1) Organising a discussion on the advantages of tourism to Jamaica and/or the impact of tourism on the environment
**WATERSHEDS AND RIVERS OF JAMAICA**

**Objectives:**
**Students will:**
1. Define the term "watershed"
2. Explain how watersheds work
3. Name the watersheds in Jamaica and their principal rivers
4. Identify threats to watersheds and rivers
5. Identify solutions to these threats
6. Illustrate the water/hydrologic cycle

**Objectives:**
**Students will:**
1. Define the term "Biological Diversity"
2. Explain the importance of biodiversity
3. Describe the situation in Jamaica,
4. Explain how loss of biodiversity affects humans
5. State how biodiversity can be protected

**Background Information Links**
- Forest connections-The forest in your classroom (Jamaica’s forests: Providers and protectors)
- Biodiversity
- Biodiversity finger print activity
- Biodiversity basics-
  a. How many doctor birds can live in this forest?
  b. Be a biodiversity detective

**BiDiversity**

**Objectives:**
**Students will:**
1. Describe the term "Biological Diversity"
2. Explain the importance of biodiversity
3. Describe the situation in Jamaica,
4. Explain how loss of biodiversity affects humans
5. State how biodiversity can be protected
6. Illustrate the water/hydrologic cycle

**Objectives:**
**Students will:**
1. Define the term "Biological Diversity"
2. Explain the importance of biodiversity
3. Describe the situation in Jamaica,
4. Explain how loss of biodiversity affects humans
5. State how biodiversity can be protected

**Students’ research should focus on the following:**
- What is meant by the term “biological diversity”
- Examples of how protection of biodiversity is important to humans
- Places where biodiversity is particularly rich, such as rainforests, coral reefs, some islands
- Threats to biodiversity
- How biodiversity can be protected
BACKGROUND INFORMATION LINK
∞ Forest Connections: The forest in your classroom (Jamaica’s forests—Providers and protectors; The web of life game; Watershed weather watch

This research can be infused into the following areas of the Primary curriculum

Grade 4 Social Studies
Term 1; Unit 1; Unit title: Jamaica—Its Location and Physical Features
Focus question 2: How would I describe the Jamaican landscape?

Objectives
Pupils will:
♦ Describe Jamaica’s physical features
♦ Locate the main rivers on a map of Jamaica
♦ Explain the general direction of the flow of the main rivers

Procedures/activities (Page 139)
#10 Examine a physical map of Jamaica again and use key to locate the main rivers
#11 Associate rivers with parishes and present this information using a table
#12 Name the longest and widest rivers
#13 From observation of the map make a general statement about the direction in which the rivers flow and identify the exceptions
BACKGROUND INFORMATION
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RESOURCE LIST

NON GOVERNMENT ORGANIZATIONS

Association of Science Teachers of Jamaica
C/o Dr. Errol Miller, Knox Community College
Spauldings P.O. Clarendon
Tel: 987-8047/9
Fax: 987-8048

Birdlife Jamaica
2 Starlight Avenue, Kingston 6
Tel/Fax: 927-1864
Email: birdlifeja@yahoo.com
Website: www.birdlifejamaica.com

Blue and John Crow Mountain National Park
C/o Jamaica Conservation & Development Trust
Tel: 920-8278-9, 960-2848-9, 960-3708
Fax: 960-2850
Email: jcdt@kasnet.com
Website: www.greenjamaica.org

Children First
9 Monk Street, Spanish Town, St. Catherine
Tel: 984-0367
Fax: 984-2839
Email: kidz@cwjamaica.com
Website: www.jamaica-kidz.com

International School of Jamaica
P.O. Box 36, Oracabessa, St. Mary
Tel: 725-0933
Fax: 725-0060
Email: isja1@yahoo.com

Jamaica Conservation & Development Trust
29 Dumbarton Avenue, Kingston 10
Tel: 960-2848-9, 920-8278-9
Fax: 960-2850
Email: jcdt@kasnet.com
Website: www.greenjamaica.org

Jamaica 4H Clubs
95 Old Hope Road, Kingston 6
Tel: 927-4050-2
Fax: 978-3209
Email: jamaica.4h@cwj.com
Website: www.jamaica4h.com

Jamaica Organic Agricultural Movement
Ministry of Agriculture
Hope Gardens, Kingston 6
Tel: 927-1731-50, 983-2267
Email: joam@mail.com
Website: www.joam@freewebsitehosting/index.asap

Jamaica Environment Trust
11 Waterloo Road, Kingston 10
Tel: 960-3693
Fax: 926-0212
Email: jet@infochan.com
Website: www.jamentrust.org

Friends of The Sea
Mahogany Beach, Ocho Rios
Tel: 974-4428
Fax: 974-7811
Email: info@friendsofthesea.org
Website: www.friendsofthesea.org

Dolphin Head Trust
Hanover Museum
Lucea, Hanover
Tel: 956-3549
Email: paulahurlock@hotmail.com
Montego Bay Marine Park
Pier 1, Howard Cooke Boulevard
Montego Bay, St. James
Tel: 979-5127 / 952-5619
Fax: 940-0659
Email: mbmp@n5.com.jm
Website: www.montegobayjamaica.com/mbmp

National Environmental Societies Trust
173 Constant Spring Road, Kingston 8
Tel: 969-6502
Fax: 969-7987
Email: nest@mail.infochan.com
Website: www.jsdnp.org.jm/nestjamaica

National Wildlife Foundation
Hope Gardens, Kingston 6
Tel: 927-1085
Fax: 970-2459
Email: nwfhopezoo@yahoo.com

Natural History Society of Jamaica
C/o Dept. of Life Sciences,
UWI, Mona, Kingston 7
Tel: 977-6938
Fax: 977-1075

Negril Coral Reef Protection Society
P.O. Box 27, Norman Manley Boulevard
Negril, Westmoreland
Tel: 957-3735
Fax: 957-4626
Email: coralreef@cwjamaica.com

Negril Area Environmental Protection Trust
P.O. Box 2599, Negril Community Centre,
Norman Manley Blvd., Negril, Westmoreland
Tel: 957-3736
Fax: 957-3115
Email: nept@n5.com.jm
Website: www.preservenegril.com

Portland Environment Protection Association
6 Allan Avenue, Pt. Antonio, Portland
Tel: 993-9632
Fax: 715-3705
Email: pepa@cwjamaica.com

St. Ann Environment Protection Association
P.O. Box 212, Runaway Bay, St. Ann
Tel/Fax: 973-4305
Email: ee@cwjamaica.com or staepa@anngel.com.jm

St. Thomas Environmental Protection Association
C/o The RADA office
Belfast, Morant Bay, St. Thomas
Tel: 982-2205
Email: s_t_e_p_a@hotmail.com

Southern Trelawny Environmental Agency
#3 Grants Office Complex
Albert Town P.O., Trelawny
Tel: 610-0818
Fax: 610-0819
Email: stea@cwjamaica.com

Western Society for the Upliftment of Children
26 Miriam Way,
Filandy Centre,
Shop #18 & 19
Montego Bay #2 P.O., St. James
Tel: 952-3377
Fax: 979-9879
Email: westkidz@cwjamaica.com
GOVERNMENT AGENCIES

Environmental Foundation of Jamaica
1B Norwood Avenue, Kingston 5
Tel: 960-6744, 960-7954
Fax: 920-8999
Email: efj.ja@cwjamaica.com
Website: www.efj.org.jm

Environmental Warden Services
38 South Camp Road
Kingston 4
Tel: 928-0082 / 930-0662-3

Fisheries Division
Marcus Garvey Drive, P.O. Box 470, Kingston 13
Tel: 923-8811-3
Fax: 923-7172
Email: fish_div@cwjamaica.com

Forestry Department
173 Constant Spring Road, Kingston 8
Tel: 924-2667/8, 931-4136
Fax: 924-2627
Email: forestrydepartment@forestry.gov.jm
Website: www.forestry.gov.jm

Ministry of Agriculture
Hope Gardens, Kingston 6
Tel: 927-1731-50
Email: psoffice@moa.gov.jm
Website: www.moa.gov.jm

Ministry of Education, Youth & Culture
2 National Heroes Circle, Kingston 4
Tel: 922-1400-19
Fax: 967-1837
Website: www.moec.gov.jm

Ministry of Health
2-4 King Street, Kingston
Tel: 967-1100 / 967-1092
Email: administrator@moh.gov.jm
Website: www.moh.gov.jm

Ministry of Land & the Environment
16a Half Way Tree Road, Kingston 10
Tel: 920-4081/3273/9117
Fax: 929-6005
Email: mle@cwjamaica.com

Ministry of Local Government & Community Development
85 Hagley Park Road, Kingston 10
Tel: 754-0992-9
Website: www.mlgcd.gov.jm

Ministry of Water & Housing
6 St. Lucia Avenue, Kingston 5
Toll Free: 1-888-754-0000 or 1-888-468-7464
Tel: 754-0973
Fax: 754-0975
Email: prumow@cwjamaica.com

National Solid Waste Management Authority
61 Half Way Tree Road, Kingston 10
Tel: 926-8559 / 5170 or 920-7939
Fax: 920-1415 / 754-5955
Email: phadro_s@mpm.gov.jm

National Water Commission
28-48 Barbados Avenue, Kingston 5
Tel: 929-5430
Fax: 926-1329
Email: cbuchnan@nwc.com.jm
Website: www.nwcjamaica.com

National Environment & Planning Agency (NEPA)
(Formerly NRCA)
10 Caledonia Avenue, Kingston 5
Tel: 754-7550/1
Fax: 754-7595
Email: pubed@nepa.gov.jm
Website: www.nepa.gov.jm
National Environmental Education Committee  
C/o NEPA, 10 Caledonia Avenue, Kingston 5  
Tel: 754-7578  
Fax: 754-7597  
Email: neec@nepa.gov.jm  
Website: www.nepa.gov.jm

National Resources Conservation Authority  
10 Caledonia Avenue, Kingston 10  
Tel: 754-7550/1  
Website: www.nepa.gov.jm

Pesticides Control Authority  
Ministry of Health  
2-4 King Street  
Tel: 967-1100 or 967-1092  
Email: administrator@moh.gov.jm  
Website: www.moh.gov.jm

Public Health Authority  
1 Marescaux Road  
Kingston 5  
Tel: 926-1550-2  
Email: ksahd@n5.com.jm  
Website: www.serha.gov.jm

Rural Agricultural Development Authority  
Hope Gardens, Kingston 6  
Tel: 977-1158-62  
Fax: 970-4660  
Email: rada@cwjamaica.com  
Website: www.radajamaica.com.jm

Water Resources Authority  
Hope Gardens, Kingston 7  
Tel: 977-3608/4194/7565  
Email: wra@colis.com  
Website: www.wra-ja.org

MARINE INFORMATION

Discovery Bay Marine Lab  
P.O. Box 35, Discovery Bay, St. Ann  
Tel: 973-2241  
Fax: 973-3091

Friends of The Sea  
Mahogany Beach, Ocho Rios  
Tel: 974-4428  
Fax: 974-7811  
Email: info@friendsofthesea.org  
Website: www.friendsofthesea.org

Montego Bay Marine Park  
Pier1, Howard Cooke Boulevard  
Montego Bay, St. James  
Tel: 979-5127/952-5619  
Fax: 940-0659  
Email: mbmp@n5.com.jm  
Website: www.montegobayjamaica.com/mbmp

Negril Coral Reef Protection Society  
P.O. Box 27, Norman Manley Boulevard  
Negril, Westmoreland  
Tel: 957-3735  
Fax: 957-4626  
Email: coralreef@cwjamaica.com
RECYCLING POSSIBILITIES

Note: Be sure to call ahead to see if the company will serve your school

**Plastic bottles**
Recycle for Life  
Southern Region/Kingston  
Tel: 960-1138/926-2043  
Fax: 929-0540  
Email: rflkgn@cwjamaica.com  
Northern Region (Portland-Trelawny)  
Tel: 974-2578  
Email: rflocho@cwjamaica.com  
Western Region (Manchester-St.James)  
Tel: 974-2578 / 831-0156

REQUESTS FOR SEEDS

Coconut Industry Board  
18 Waterloo Road, Kingston 10  
Tel: 926-1770  
Fax: 968-1360  
Email: cocindbrd@cwjamaica.com

Forestry Department  
173 Constant Spring Road, Kingston 8  
Tel: 924-2667/8, 931-4136  
Fax: 924-2626  
Email: forestrydepartment@forestry.gov.jm  
Website: www.forestry.gov.jm

Rural Agricultural Development Authority  
Hope Gardens, Kingston 6  
Tel: 977-1158-62  
Fax: 970-4660  
Email: rada@cwjamaica.com  
Website: www.radajamaica.com.jm

TALKS AND PRESENTATIONS

Public Education Department, NEPA  
10 Caledonia Avenue, Kingston 5  
Tel: 906-1394, 929-7481  
Email: pubed@nepa.gov.jm  
Website: www.nepa.gov.jm

Birdlife Jamaica  
2 Starlight Avenue, Kingston 6  
Tel/Fax: 927-1864  
Email: birdlifeja@yahoo.com  
Website: www.birdlifejamaica.com

National Water Commission Public Relations  
28-48 Barbados Avenue, Kingston 5  
Tel: 929-5430  
Fax: 926-1329  
Email: cbuchnan@nwc.com.jm  
Website: www.nwcjamaica.com

Trees for Tomorrow  
Forestry Department  
173 Constant Spring Road, Kingston 8  
Tel: 924-2667/8, 931-4136  
Fax: 924-2626  
Email: forestrydepartment@forestry.gov.jm  
Website: www.forestry.gov.jm

Jamaica Environment Trust  
11 Waterloo Road, Kingston 10  
Tel: 960-3693  
Fax: 926-0212  
Email: jet@infochan.com  
Website: www.jamentrust.org
TRIPS AND PROGRAMMES

Cranbrook Flower Forest
St. Ann's Bay
Tel: 995-3097

Hollywell Park, Oatley Nature Trail and Blue Mountains
Blue and John Crow Mountain National Park
Jamaica Conservation & Development Trust
29 Dumbarton Avenue, Kingston 10
Tel: 960-2848-9, 920-8278-9
Fax: 960-2850
Email: jcdt@kasnet.com
Website: www.greenjamaica.com

Hope Zoo and Botanical Gardens
Hope Gardens, Kingston 6
Tel: 927-1085
Fax: 970-2459
Email: nwfhopezoo@yahoo.com

Institute of Jamaica
10-16 East Street, Kingston
Tel: 922-0620-6
Fax: 922-1147
Email: ioj.jam@mail.infochan.com
Website: www.instituteofjamaica.org.jm

Guanaboa Vale Community Tour
C/o Guanaboa Vale All Age School Community
Management Group
Tel: 943-0141
Email: sewell@infochan.com

Moneague Arboretum
Moneague, St. Ann
Tel/Fax: 973-0190

Montego Bay Marine Park
Pier1, Howard Cooke Boulevard
Montego Bay, St. James
Tel: 979-5127/952-5619
Fax: 940-0659
Email: mbmp@n5.com.jm
Website: www.montegobayjamaica.com/mbmp

Serenity Farms, Guardsman Serenity
Bushy Park P.O., Spring Village, St. Catherine
Tel: 983-8758

Highgate Park
Sligoville, St. Catherine
Tel: 749-1845
Fax: 982-8758

Cockpit Country Tours
Southern Trelawny Environmental Agency
#3 Grants Office Complex
Albert Town P.O., Trelawny
Tel: 610-0818
Fax: 610-0819
Email: stea@cwjamaica.com

Knox Educational Study Tours (KEST)
C/o Knox Community College
P.O. Box 52, Spauldings, Clarendon
Tel: 791-0854, 987-8047/9 ext. 2145
Fax: 987-8048

Valley Hikes
Portland
Tel: 993-3881
VERMICOMPOSTING

Decton Hylton
International School of Jamaica
P.O. Box 36, Oracabessa, St. Mary
Tel: 725-0933
Fax: 725-0060
Email: isja1@yahoo.com

Jamaica 4H Clubs
95 Old Hope Road, Kingston 6
Tel: 927-4050-2
Fax: 978-3209
Email: jamaica.4h@cwj.com
Website: www.jamaica4h.com

WILDLIFE INFORMATION

Birdlife Jamaica
2 Starlight Avenue, Kingston 6
Tel/Fax: 927-1864
Email: birdlifeja@yahoo.com
Website: www.birdlifejamaica.com
Serenity Farms, Guardsman Serenity
Bushy Park P.O., Spring Village, St. Catherine
Tel: 983-8758

Natural History Society of Jamaica
C/o Dept. of Life Sciences,
UWI, Mona, Kingston 7
Tel: 977-6938
Fax: 977-1075