

WECAN: YOUTH TEACH YOUTH. ENVIRONMENTAL SCIENCE HANDBOOK FOR ENVIRONMENTAL EDUCATION AND AWARENESS IN SCHOOLS

CASE STUDY JACK'S HILL ALL AGE SCHOOL



Table of Contents

[ACKNOWLEDGEMENTS](#)

[SUMMARY](#)

[I.INTRODUCTION](#)

[II.ENVIRONMENTAL SCIENCE CURRICULUM](#)

Week 1 - Environmental Terms

- Grade 4
- Grades 5 and 6
- Grades 7 to 9

Week 2 - Reasons for Preserving the Environment

- Grade 4
- Grades 5 and 6
- Grades 7 to 9

Week 3 - Endangered Endemic Animals of Jamaica

- Grade 4
- Grades 5 and 6
- Grades 7 to 9

Week 4 - Mammals

- Grade 4
- Grades 5 and 6
- Grades 7 to 9

Week 5 - Insects

- Grade 4
- Grades 5 and 6
- Grades 7 to 9

Week 6 - Amphibians and Reptiles

- Grade 4
- Grades 5 and 6
- Grades 7 to 9

Week 7 - Birds

- Grade 4
- Grades 5 and 6
- Grades 7 to 9

Week 8 - Plants

- Grade 4
- Grades 5 and 6
- Grades 7 to 9

Week 9 - Things we can do

- Grade 4

- Grades 5 and 6
- Grades 7 to 9

III.CONCLUSIONS AND RECOMMENDATIONS

IV.TEACHER'S NOTE (GLOSSARIES)

- Box 1 - Environmental Terms - Grade 4
- Box 2 - Environmental Terms - Grades 5 and 6
- Box 3 - Environmental Terms - Grades 7 to 9
- Box 4 - Reasons for Preserving the Environment - Grade 4
- Box 5 - Reasons for Preserving the Environment - Grades 5 and 6
- Box 6 - Reasons for Preserving the Environment - Grades 7 to 9
- Box 7 - Endangered Endemic Animals of Jamaica - Grade 4
- Box 8 - Endangered Endemic Animals of Jamaica - Grades 5 and 6
- Box 9 - Endangered Endemic Animals of Jamaica - Grades 7 to 9
- Box 10 - Mammals - Grade 4
- Box 11 - Mammals - Grades 5 and 6
- Box 12 - Mammals - Grades 7 to 9
- Box 13 - Insects - Grade 4
- Box 14 - Insects - Grades 5 and 6
- Box 15 - Insects - Grades 7 to 9
- Box 16 - Amphibians and Reptiles - Grade 4
- Box 17 - Amphibians and Reptiles - Grades 5 and 6
- Box 18 - Amphibians and Reptiles - Grades 7 to 9
- Box 19 - Birds - Grade 4
- Box 20 - Birds - Grades 5 and 6
- Box 21 - Birds - Grades 7 to 9
- Box 22 - Plants - Grade 4
- Box 23 - Plants - Grades 5 and 6
- Box 24 - Plants - Grades 7 to 9
- Box 25 - Things WE can do - Grade 4
- Box 26 - Things WE can do - Grades 5 and 6
- Box 27 - Things WE can do - Grades 7 to 9

[Annex I](#)

[Annex II](#)

[Annex III](#)

[Annex IV](#)

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Environmental Education and Awareness in Schools - Case study Jack's Hill All Age School

CEP Technical Report No. 30 1994

ACKNOWLEDGEMENTS

This handbook has benefitted from the support, advice and experience of many people. In particular we would like to thank Mrs. Catherine Levy (Gosse Bird Club) who pointed us to unlimited sources of information and shared her knowledge and valuable experience; Mr. Peter Bentley and Ms. Ann Adams who gave us the opportunity of working with the children in the Jacks Hill community; Mr. and Mrs. Barry Wignall for their support and assistance; Mr. and Mrs. Jacob Degia for their valuable support and input.

The assistance of the following organizations is gratefully acknowledged: Wildlife and Environmental Conservation Action Now (WECAN), the Gosse Bird Club, the Hope Zoo and the Conservation Data Centre - Jamaica.

Finally, we would like to thank the staff of the Regional Co-ordinating Unit of UNEP's Caribbean Environment Programme, in particular Mr. Jan Voordouw, for the assistance and for making this publication possible.

This publication is dedicated to the formal and informal teachers of Jamaica who mould and shape the minds of generations. We hope this publication will help to instill an environmental moral that will restore Jamaica to its former claim - "Land of Wood and Water".

SUMMARY

Ask the average Jamaican how many birds are found **only** in Jamaica. You will notice a puzzled look on their faces as they ask, "In Jamaica?". The word "Environment" has been a catch-all word used loosely in the last two years. Most Jamaicans speak of an "environmental crisis" often without realizing that they contribute suicidally to this problem. It is in short a trend - a fad to talk about "the environment".

In our work at Jacks Hill we asked our students to raise their hands if they knew what tigers and bears were. Every hand went up in the class. When we asked about coneys and other Jamaican animals, only one student, if any, would raise his hand. Africa and even North America promote their indigenous and endemic plants and animals so much that they are known worldwide. Jamaica, however, spends little time promoting her natural history, and rarely stops to make her people aware of her high rate of endemism and beauty in her indigenous flora and fauna. We need to find out more about our natural history. It is just as important as our political history and culture, yet it often goes unnoticed. We have met so many tourists and scientists who have come from half way around the globe just to photograph an endemic fern or an endangered bird.

Working at Jacks hill All Age School gave us the wonderful opportunity of laying the foundation for an appreciation of Jamaican Natural History in youth who are future leaders of society.

Several persons and groups have recognized that in order to find out where Jamaica stands in "the Environmental Crisis", they need to know where Jamaica stood - possibly as early as up to the time when Columbus chanced upon the shores of Jamaica. They recognise that extinction has occurred since the beginning of time but know that man's development has sped this process up, dangerously. Going beyond merely analyzing and presenting statistics, several of these groups have recognised the importance of public education. Simply, if people don't even know what is out there to protect then telling them to protect "the environment" is a totally abstract concept which they cannot relate to. Getting them to take action is therefore virtually impossible.

The informal motto of the Wildlife and Environmental Conservation Action Now (WECAN) Youth Club is "educate then activate". This group is involved in a two-part ongoing education programme: (1) Educating their club members through field trips, slide shows, discussion, and various other methods; and (2) Educating the public, target group 10 - 12 years old, through a magazine published by the club members. The club is run by youth and aims to educate other youth. This makes the club one of the great number of "self-governing" environmental youth organisations in the world. WECAN members believe that adults are more likely to listen to children than other adults and that children relate better to their peers. Children are thus effective in relaying a message that will affect their generation and generations to come.

The Gosse Bird Club, is another group that has become very active in public awareness programmes in Jamaica. This organisation has targeted primary and secondary schools and Teacher's Colleges to present slide shows and to lead bird watches. The Club employs various other methods for children and their teachers to

open their eyes to the beauty and value of the many birds found in Jamaica. The Gosse Bird Club realises that in order to save the endemic birds of Jamaica, people need to learn about them so that they can protect them. The Gosse Bird Club has been traveling island-wide giving free slide shows to schools, Environmental Non-Governmental Organisation (ENGO'S) and other special interest groups.

There are a number of other groups recognising the importance of public awareness of the environment who have been implementing youth activities independent of government. In addition to these groups, teachers in the formal education system have, from time to time expressed their interest in teaching the natural history of Jamaica. Their efforts were often thwarted by the hours of research that are often necessary to compile adequate information to use in a class period. Because of the tremendous time needed to prepare such a lesson, many interested teachers have given up until a formal science curriculum has been put in place by the Ministry of Education. Waiting for such a programme to be put in place may be too late for some species and jeopardise the status of others. The time for action is NOW! This handbook is offered as a guide to implementing an environmental ethic in children until an appropriate syllabus is put in place by the Ministry of Education.

The handbook is structured to give students an appreciation of Jamaican wildlife over a nine-week period, using the same topics, procedure and culminating activities that were used at Jacks Hill All Age School. The first week covers terms and concepts which are important in understanding the topics covered during the following weeks. These terms lay the basis for the weeks to come and give the teacher an idea of his or her student's understanding of and attitudes towards wildlife. Each week, a different area is covered moving from general concepts to specific groups of animals to methods students can employ daily to help preserve Jamaican wildlife.

We hope that the benefits gained by your organisation as a result of these teaching methods will be just as successful as it was at Jacks Hill in instilling a basic knowledge and understanding of Jamaica's Natural History.

I. INTRODUCTION

Chandra Degia and Garfield Brown were born in 1975 and 1967 respectively. Chandra went to St. Hugh's High School and Garfield went to Kingston College, after which he went on to the College of Arts, Science and Technology to study Mechanical Engineering. They are both presently pursuing degrees in Wildlife Biology at Grambling State University. They have both been active members of several environmental organizations. Chandra has been the President of Wildlife and

Environmental Conservation Action Now (WECAN), an environmental youth club for two consecutive years and has been instrumental on the Education Committee of the Gosse Bird Club in training slide show presenters, organizing and doing slide shows herself and leading bird watches. Garfield Brown has been on the executive committee of both the Gosse Bird Club and WECAN, and has been key in building the strong foundation on which WECAN now stands.

In September of 1992 they decided to take up the challenge of teaching Environmental Science to youngsters (ages 9 to 15) at the Jack's Hill All Age School with a strong emphasis on Jamaican wildlife and how it relates to the students. Both Chandra and Garfield felt that this was important as they realized the general lack of environmental awareness among the youth of Jamaica. The programme lasted for one term, ending in November. Some topics focussed on plants, birds and reptiles.

In general it was difficult to access information as there was relatively little information on endemic plants and animals. If such information was available it was restricted to one or two sources; or it was so heavily embedded in scientific jargon that reading was agonizing and slow.

The above factors led them to developing and implementing an environmental science syllabus in the school with the aims of: raising the children's level of awareness and knowledge of their environment; helping them to understand their environment; helping them commit themselves to preserving their environment; promoting cooperation; developing patriotism and national pride among the children; and making environmental education a life-long process, out of which an environmental ethic develops. (*Adapted from the Gosse Bird Club Education Committee aims and goals.*)

This document is being published as a result of the work done at the Jack's Hill All-Age School, so that the information may be accessible to other teachers and interested parties wishing to implement an environmental curriculum in their school. The document is set out in the form of actual lesson plans. Each lesson is divided into two parts, covering both the theoretical and practical aspects.

At the end of the handbook, there are glossaries which provide useful background information for the teacher.

II. ENVIRONMENTAL SCIENCE CURRICULUM

WEEK 1 - Environmental Terms

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GRADE 4

Topic: Environmental Terms

Source: (1) Project Wild by W.R.E.C.C.

Aim: To increase students' familiarity with terms that are important in understanding wildlife and ecological systems.

Objectives: Students will be able to interpret and identify ecological concepts.

Materials: Chalkboard, wordlist (see Teacher's Note), small pieces of paper with environmental terms printed on them, container.

Skills: Observation, reading, visualisation, synthesis, application, invention, problem solving, small group work.

Procedure: (a) Define words together in class orally.

(b) List words and definitions on chalkboard. This encourages students to think and remember.

(c) Leave the room or erase the board to review words. This provides a challenge and encourages good memory retention.

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Culminating Activity:

Students review vocabulary through use of pantomime. Go outside for this activity where noise level is less of a problem, and the environment is conducive.

Method:

(1) Divide students into groups of four. Each group receives a hand-out with environmental terms and their definitions on them. The words selected encompass a

broad variety of ecological concepts and are also easily portrayable by a small group of students.

2) List all the words on small pieces of paper and put them in a container.

(3) Each group draws one word from the container, looks up the definition using the handout, and decides how to pantomime that word. Give the groups approximately five minutes to prepare their mimes.

(4) The groups of students then take turns miming their words to the class. Teachers can set a time limit of one minute per group.

(5) The rest of the class may use the handouts as a guideline for guessing the word being mimed.

(6) Groups gain one point for a successful mime (having their word guessed within the one-minute time limit), and one point for guessing another group's mime correctly.

(7) Repeat the activity several times by letting each group choose different words then, act them out; or have "star mimers" assist students who have muddled their mime.

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NB Notebooks may be used instead of handouts.

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GRADES 5 and 6

See "Topic" through "Procedure" as discussed above under Grade 4.

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Culminating Activity:

Students review vocabulary through use of pantomime. Go outside for this activity where noise level is less of a problem, and the environment is conducive.

Method:

- (1) Students form groups of four. Each group receives a hand-out with the environmental terms and their definitions on them. The words selected encompass a broad variety of ecological concepts and are also easily portrayable by a small group of students.
- (2) List all the words on small pieces of paper and put them in a container.
- (3) Each group draws one word from the container, looks up the definition using the hand-out, and decides how to pantomime that word. Allow approximately 5 minutes for the groups to prepare their mimes.
- (4) Groups of students then take turns miming their words to the class. Set a time limit of one minute per group.
- (5) The rest of the class may use the handouts as a guideline for guessing the word being mimed.
- (6) Groups gain one point for a successful mime (having their word guessed within the one-minute time limit) and one point for guessing another group's mime correctly.
- (7) Repeat the activity using different words but keep the groups intact; or have "star mimers" assist students who have muddled their mime. The group with the most points at the end is the winner.

NB Definitions of words in exercise books may be used instead of handouts.

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GRADES 7 to 9

Topic: Environmental Terms

Source: (1) Project Wild by W.R.E.C.C.

Aim: To increase students' familiarity with terms that are important in understanding wildlife and ecological systems.

Objectives: Students will be able to interpret and identify ecological concepts.

Materials: Chalkboard, wordlist, paper, pens/pencils.

Skills: Reasoning, observation, reading, visualisation, synthesis, application, invention, small group work.

Procedure: (a) Define words together in class orally.

(b) List words, definitions and examples on chalkboard.

(c) Promote discussion.

-

Culminating Activity:

To review definitions of the words taught.

(1) Group students in threes.

(2) Ask each group to draw a food chain that can be observed in Jamaica.

(3) Ask each group to write a paragraph or two using at least five words on the wordlist.

(4) Each group reads their work to the class, to stimulate discussion.

WEEK 2 - Reasons for Preserving the Environment

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GRADE 4

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Topic: Reasons for preserving the environment.

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Source: (1) Sharing Nature with Children by Joseph Cornell.

(2) Extinction by Paul Ehrlich.

Aim: To teach students four (4) basic reasons for preserving the environment.

Objectives: (a) Students will be able to appreciate why they should protect and conserve the environment.

(b) They will become more aware of "The Balance of Nature" and begin to understand that practising environmentally unfriendly habits, leading to the extinction of other species, will inevitably lead to the destruction of mankind.

Materials: Chalkboard, ball of string, pencils, index cards, sheets of paper, postage stamps, pencils.

Skills: Observation, reading, visualisation, synthesis, application, invention, problem solving.

Procedure: (a) List words and brief explanations on chalkboard.

(b) The students copy these into their notebooks. This serves as a reference for later topics.

(c) Promote discussion using pictures, posters, postage stamps and actual plant and animal specimens.

-

Culminating Activity:

Activity A -

(1) The students stand in a circle outdoors.

(2) Questions concerning various plants and animals linked to each other are asked. For example: "Who can name a tree found in this area?... a coconut tree, good. Now who can name an animal that lives in dead coconut trees?... A Jamaican woodpecker, good, etc."

(3) Students that answer correctly take hold of a ball of string. Questions are asked until all students are holding the string and a web is formed.

(4) To demonstrate the inter-dependence of all organisms, one is removed. For example: "There is a fire to make space for farming, so you Mr. Tree burn to the ground."

(5) "Mr. Tree" then tugs on the string. All who feel the tug, tug in return until everyone feels the tug. This demonstrates the importance of each and every organism and how far-reaching the effects of their destruction are.

Activity B

- (1) Each child will be given an imaginary title to a large area of land.
- (2) On this plot they will be free to create their own dream forest, completed with as many trees, mountains and rivers as they desire.
- (3) To encourage creativity suggestions should be made such as "To make your forest beautiful, you can add waterfalls or rainbows, etc."
- (4) Let students list the "ingredients" of their forest and afterwards draw a picture of it.
- (5) End by discussing with them whether their forests are able to maintain themselves year after year. For instance, see if they have chosen representatives of the food cycle: plants, herbivores, carnivores, and decomposers (ants, bacteria).

Both activities are geared at emphasising the fourth reason, Ecosystems, (see Teacher's Note), for preserving the environment. The concepts, attitudes and qualities which both activities teach include aesthetic appreciation, the balance of nature, adaptation, habitat and inter-dependence.

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GRADES 5 and 6

See "Topic" through "Procedure" as discussed above for Grade 4.

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Culminating Activity:

Activity A

- (1) The students stand in a circle outdoors.
- (2) Questions concerning various plants and animals linked to each other are asked. For example: "Who can name a plant found in this area?... old man's beard (Bromeliad), good. Now who can name an animal that stores food in the old man's beard?...an American kestrel (a bird of prey), good, etc."
- (3) Students that answer correctly take hold of a ball of string. Questions are asked until all students are holding the string and a web is formed.
- (4) To demonstrate the inter-dependence of all organisms, one is removed.

For example: "There is a fire to make space for farming, so you Mr. Tree burn to the ground."

(5) "Mr. Tree" then tugs on the string. All who feel the tug, tug in return until everyone feels the tug. This demonstrates the importance of each and every organism and how far-reaching the effects of their destruction are.

Activity B

(1) Each child will be given an imaginary deed to a large area of land.

(2) On this plot they will be free to create their own dream forest, completed with as many trees, mountains and rivers as they desire.

(3) To encourage creativity suggestions should be made such as "To make your forest beautiful, you can add waterfalls or rainbows, etc."

(4) Students will be required to list the "ingredients" of their forest and afterwards to draw a picture of it.

(5) End by discussing with them whether their forests are able to maintain themselves year after year. For instance, see if they have chosen representatives of the food cycle: plants, herbivores, carnivores, and decomposers (ants, bacteria).

Both activities are geared at emphasising the fourth reason Ecosystems, (see Teacher's Notes). The concepts, attitudes and qualities which both activities teach are aesthetic appreciation, the balance of nature, adaptation, habitat and inter-dependence.

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GRADES 7 to 9

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Topic: Reasons for preserving the environment.

-

Source: (1) Project Wild by W.R.E.C.C.

(2) Extinction by Paul Ehrlich.

Aim: To teach students four (4) basic reasons for preserving the environment.

Objectives: (a) Students will be able to appreciate and understand why they should protect and conserve the environment.

(b) They will become more aware of "The Balance of Nature" and begin to understand that practicing environmentally unfriendly habits, leading to the extinction of other species, will inevitably lead to the destruction of Homo sapiens (humans).

Materials: Chalkboard, writing materials, three (3) 1' x 1' x 1' containers, earth, compost material, earthworms, seeds.

Skills: Reading, visualisation, synthesis, application, problem solving.

Procedure: (a) List words and brief explanations on chalkboard.

(b) The students copy these into their notebooks. This serves as a reference for later topics.

(c) Promote discussion using pictures and actual plant and animal specimens.

-

Culminating Activity:

This is an on-going activity that may take several weeks. The objective of this exercise is to help the students recognise that wildlife in many forms contribute to the diversity and balance of ecological systems.

(1) From the same source, collect enough soil to fill the three 1' x 1' x 1' containers.

(2) With students, do simple tests to determine the quality of the soil.

For example: (a) Look for plant or animal matter in the soil.

(b) Count the number of species you can identify.

(c) Check porosity of soil by determining how fast water will run through it.

(d) Conduct a settling test to see what general proportions of soil components are present (eg. sand, silt, pebbles, clay, organic materials).

(3) After tests have been completed, and recorded, fill the three containers with the soil.

(4) One container is the "control" container in which nothing is added to the soil. The second is for soil and compost, and the third is for soil, compost and earthworms.

(5) Since the earthworms in container number three are in a limited environment, the students will need to keep adding the food and other compost material (eg. table scraps, leaves, grass) to container 2 and 3. Plan on adding materials once a week for three weeks, and watering once a week. You may also water boxes one and two **but do nothing else to box one.**

(6) Encourage the students to watch for changes in any of the boxes.

(7) At the end of the three-week period conduct the same set of experiments you originally did, on the three boxes.

(8) Discuss findings. What differences are there in the three soil samples?

(9) Now plant seeds in all three of the boxes. Plant the same number of seeds in each of the boxes. Record the date of planting and all watering.

(10) Record all changes in the boxes as the plants begin to grow.

(11) After three weeks compare and discuss the results.

(12) Describe the importance of plant and animal matter as contributors to soil. Talk about earthworms as one example of the role of wildlife in contributing to healthy environments!

WEEK 3

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GRADE 4

Topic: Endangered Endemic Animals of Jamaica

Source: 1. Brochures from the Conservation Data Centre, Jamaica.

2. Jamaica Naturalist, Volumes 1 and 2 by The Natural History Society of Jamaica.

3. Project Wild by W.R.E.C.C.

Aim: To make children aware of several endangered endemic animals in Jamaican.

Objectives: At the end of the week students should be able to:

- i) give the names of at least *four* endangered Jamaican animals.
- ii) give at least *two* reasons as to why each one is endangered.

Materials: Posters, chalkboard, scorecards, pictures, pamphlets, question papers.

Skills: Analysis, application, description, discussion, evaluation, small group work, observation, reporting.

Procedure: a) Review the meanings of the words "endangered", "extinct" and "endemic".

b) Using posters/pictures show students at least four endemic endangered animals found in Jamaica.

c) For each animal, the children will be given at least two reasons why it is endangered.

d) Students copy the names and reasons to their books for future reference.

-

Culminating Activity:

1) Students will be asked to go home after school and look for "animals and actions" in their communities that appear to help or harm wildlife.

2) The next day each student will be required to share at least one example with the class.

3) Students will be encouraged to explain why they decided whether the action was helpful or harmful.

4) Students will then be asked to work in small groups of three. They then share what they identified as "animals" and "actions" and whether the action was helpful or harmful.

5) Each group will then pool their ideas, eliminating duplicates, and put their animals and actions on one list to represent the group's ideas. One person will be asked to report for each group and turn in the group's list.

Fig. 1

<u>COMMUNITY WILDLIFE REPORT</u>			
ACTION	EFFECT	HELPS	HURTS
Someone beating a frog.	No frogs mean a lot more harmful insects.		*
Cats eating lizards	Lizards eat flies and other insects that spread diseases. No lizards, more disease.		*

6) The teacher will then pool the ideas from all the groups, putting together one master "Community Wildlife Chart".

7) Students will also be given a similar chart to complete as homework (see Figure 2).

Fig 2.

<u>COMMUNITY WILDLIFE CHART</u>				
ACTION	EFFECT	HELPS	HURTS	NEITHER

WEEKS 3

-

GRADES 5 and 6

Topic: Endangered Endemic Animals of Jamaican

Source: 1. Brochures from the Conservation Data Centre, Jamaica.

2. Jamaica Naturalist, Volumes 1 and 2 by The Natural History Society of Jamaica

3. Project Wild by W.R.E.E.C.

Aim: To teach the students about several endangered endemic animals of Jamaica.

-

Objectives: At the end of the week students should be able to:

i) give the name of at least *five* endangered Jamaican animals.

ii) give at least *three* reasons as to why each one is endangered.

Materials: Posters, poster making materials, writing materials, and information about endemic Jamaican animals and their status (eg. endangered, rare, threatened).

Skills: Analysis, classification, listing, discussion and synthesis, small group work.

Procedure: a) Review orally the meaning of the word "endangered", "extinct" and "endemic".

b) Ask the students if they know any endemic animals that are endangered and list correct answers on the board.

c) For each correct answer, the children will be given at least three reasons why they are endangered.

d) If there are no correct answers or too few, the teacher will give examples and reasons.

e) Students will be required to copy the names and reasons into their books for future reference.

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Culminating Activity:

- 1) Students will be asked to go home after school and look for "animals and actions" in their community that appear to help or harm wild-life.
- 2) The next day each student will be required to share at least one example with the class.
- 3) Students will be encouraged to explain why they decided that the action was helpful or harmful.
- 4) Students will then be asked to work in small groups of three. They then share what they identified as "animals and actions" and decide whether the action was helpful or harmful.
- 5) Each group will then pool its ideas, eliminate duplicates, and put their animals and actions on one list (see Fig. 1). One person will be asked to report for each group and turn in the group's list.

Fig 1.

<u>COMMUNITY WILDLIFE REPORT</u>			
ACTION	EFFECT	HELPS	HURTS
Shooting a parrot.	Endangered bird; less parrots to spread seeds for trees to grow.		*
Cats eating lizards	Lizards eat flies and other insects that spread diseases. No lizards, more disease.		*

- 6) The teacher will then pool the ideas from all the groups, putting together one master "Community Wildlife Chart".
- 7) Students will also be given a similar chart to do as their homework (see Fig 2.).

Fig 2.

<u>COMMUNITY WILDLIFE CHART</u>
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ACTION	EFFECT	HELPS	HURTS	NEITHER

WEEK 3

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GRADES 7 to 9.

Topic: Endangered Endemic Animals of Jamaica.

Source: 1. Brochures from the Conservation Data Centre, Jamaica.

2. Jamaica Naturalist, Volumes 1 and 2 by The Naturalist History Society of Jamaica.

Aim: To teach the students about several endangered endemic animals of Jamaica.

Objectives: At the end of the week students should be able to:

- i) give the name of at least *six* endangered Jamaican animals
- ii) give at least *three* reasons as to why each one is endangered.

Materials: Chalkboard, pamphlets, magazines with pictures, posters, questionnaire.

Skills: Analysis, observation, writing, application, classification, reporting.

Procedure: a) Review orally the meanings of the word "endangered", "extinct" and "endemic".

b) Ask the students if they know any endemic animals that are endangered and list correct answers on the board.

c) If students do not give a correct answer, the children will be given at least three reasons why they are endangered.

5) They should then put a tick in the appropriate column identifying the animal's status (whether endangered, extinct or not endangered).

6) If they indicate that an animal is endangered, they should choose factors that have caused the particular species to become endangered, from the list placed on the board. The students then write the correct response in the column titled "Factors Affecting Endangered".

7) After students are finished and their work is collected, the teacher will then discuss each animal listed, give its status and, if it is endangered, state what the factors affecting it are.

WEEK 4

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GRADE 4

Topic: Mammals

Source: 1. Conservation Data Centre, Jamaica

2. Bush Dwellers of Australia by Australia Information Service

Aim: To refine the students' understanding of mammals, and to sensitise them to the status of Jamaica's Endemic mammals.

Objectives: At the end of the week, students should be able to:

- i) identify the characteristics of mammals,
- ii) name at least three mammals in Jamaica, including one that is endemic to Jamaica,
- iii) identify some of the services these animals provide to people.

Materials: Pictures of mammals, posters, books, chart, animal cards.

Skills: Analysis, application, description, discussion, evaluation, small group work, observation.

Procedure: a) Ask students to describe a mammal.

b) If no one knows, describe a typical mammal for students.

c) Ask students if they know any mammals, particularly mammals living in Jamaica.

d) Show students pictures of mammals, ask if they know them, then and give them the name of the mammal.

e) Teacher will point out the ones found in Jamaica.

f) Teacher will point out the ones found only in Jamaica.

g) Point out some of the benefits of mammals found in Jamaica.

-

Culminating Activity:

Activity A

1) The aim of this activity is for each student to find members of the same species on Noah's Ark.

2) The class will be divided into four groups, each representing a mammal that was previously discussed.

3) The name of each animal will be written on one quarter of all the cards. The cards will be shuffled and then passed out to the students, one card per student.

4) Each student will read his/her card and become the animal whose name is on the card, keeping his identity a secret.

5) The teacher will then collect the cards from the students.

6) The teacher will then signal the students, and they will begin acting out the sounds, shapes and typical movements with the intention of attracting others, that are the same mammals as themselves.

7) Students can make all the noise they want but talking is prohibited.

8) Each mammal must attract others of the same species solely by the authenticity of his behaviour.

9) The game ends when every mammal has found its group.

10) The game can be repeated to reinforce the ideas.

Activity B

A test may be given but is not required, to evaluate what the students have learned in the three previous weeks. See Annex 1.

WEEK 4

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GRADES 5 and 6.

Topic: Mammals

Source: 1. Conservation Data Centre, Jamaica

2. Bush Dwellers of Australia by Australia Information Service

3. Marine Mammals by UNEP, UN

4. Sharing Nature with Children by Joseph Cornell

Aim: To refine the students' understanding of what mammals are; to make them aware of Jamaica's Endemic mammals.

Objectives: At the end of the week, students should be able to:

- i) identify the features of a mammal,
- ii) name at least four mammals found in Jamaica, of which one is endemic to Jamaica,
- iii) identify some of the services that some of these animals provide to people.

Materials: Pictures of animals, posters, safety pins.

Skills: Analysis, application, description, discussion, evaluation, small group work, observation, animal classification, animal ecology.

Procedure: a) Ask students if they know what a mammal is and describe one.

b) If no one knows, describe a mammal for students.

c) Ask students if they know any mammals, particularly those found in Jamaica.

d) Show students pictures of mammals, ask if they know them, if not, give them the name of the mammal.

e) Teacher will point out the species found in Jamaica.

f) Teacher will point out the species found only in Jamaica.

g) Point out some of the benefits of mammals found in Jamaica.

-

Culminating Activity: A

1) Pin a picture (or drawing) of an animal (preferably an endemic one) on the back of one of the children in the group.

2) Don't show him the picture.

3) Have him turn around so that all the other children can see what he has become.

4) He then asks question to discover his own identity.

5) The other children can only answer yes, no and maybe to the questions.

-

Culminating Activity: B

A test may be given but not required, to evaluate what the students have learned in the three previous weeks. See Annex II.

WEEK 4

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GRADES 7 to 9.

Topic: Mammals

Source: 1. Conservation Data Centre, Jamaica

2. Bush Dwellers of Australia by Australia Information Service

3. Marine Mammals by UNEP, UN

4. Sharing Nature with Children by Joseph Cornell

Aim: To widen the students' knowledge of mammals and to make them aware of Jamaica's Endemic mammals.

Objectives: At the end of the week, students should be able to:

i) say what a mammal is,

ii) name at least five mammals indigenous to Jamaica of which one is endemic to Jamaica,

iii) say what are some of the benefits, that these animals provide to people.

Materials: Pictures of animals, posters, safety pins.

Skills: Analysis, application, description, discussion, evaluation, small group work, observation, animal classification, animal ecology.

Procedure: a) Ask students if they know what a mammal is.

b) If no one knows, give the characteristics of a mammal.

c) Ask students if they know any mammals, particularly those found in Jamaica.

d) Show students pictures of mammals. Ask if they know them, then give them the name of the mammal.

e) Teacher will point out the species found in Jamaica.

f) Teacher will point out the ones endemic to Jamaica.

g) Point out some of the benefits of mammals in Jamaica.

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Culminating Activity:

Activity A

- 1) Pin a picture of an animal on the back of one of the children in the group.
- 2) Don't show him the picture.
- 3) Have him turn around so that all the other children can see what he has become.
- 4) He then asks question to discover his own identity.
- 5) The other children can only answer yes, no and maybe to the questions asked.

Activity B

A test may be given but is not required, to evaluate what the students have learned in the three previous weeks. See Annex III.

WEEK 5

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GRADE 4.

Topic: Insects

Source: 1. An Introduction to the Study of Insects by Donald Borror

2. Project Wild by W.R.E.C.C.

Aim: To develop an appreciation of insects.

Objectives: i) For students to identify the main features of insects.

ii) To recognise insects as useful animals.

Materials: Plastic container, live grasshopper or cricket for every two students, chalkboard.

Skills: Aesthetic appreciation, analysis, classification, comparing similarities and differences, computation, description, discussion, generalisation, listing, observing, reading and writing.

Procedure: a) Differentiate vertebrates from invertebrates.

b) Discuss the main characteristics of insects.

c) Relate points of interest to endemic insects.

d) Discuss the benefits of insects.

-

Culminating Activity:

1) Divide students into groups of twos.

2) Send each pair of students outside to collect only one grasshopper.

3) Caution the students not to harm the grasshoppers.

4) Tell students they are going to act like scientists, carefully observing wildlife, with as little impact as possible on wild species.

5) Write out questions for students to use in observing their grasshopper.

For example, a) What are some of the most outstanding features of the grasshopper?

b) How many legs does it have?

c) Which legs are the jumping legs?

d) Do you see a mouth?

e) Does the grasshopper have lips?

f) Does the grasshopper always walk?

g) Do grasshoppers make noise?

- h) Does it make the sound with its mouth or with some other part of its body?
 - i) Is it the same all over?
 - j) Where does the grasshopper live?
 - k) What does it eat?
- 6) Ask some concluding questions.

For example, a) Did you think there were so many interesting things about a grasshopper?

- b) Do you think other insects might be as interesting?
 - c) What other insects or small animals might be interesting to look at and learn about?
- 7) Remind students that a grasshopper is only one kind of animal, and that animals, including grasshoppers are all shapes and sizes.
- 8) Ask students to take their grasshopper outside and let it go.
- 9) Point out some contributions grasshoppers make to the ecological systems, for example, food for birds.

WEEK 5

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GRADES 5 AND 6

Topic: Insects

Source: 1. An Introduction to the Study of Insects by Donald Borror

2. Project Wild by W.R.E.C.C.

Aim: To develop an appreciation of insects.

Objectives: i) To develop students' ability to make scientific deductions from observation.

ii) For students to identify the main features of insects.

iii) To recognise insects as useful animals.

Materials: Plastic container, live grasshopper or cricket for every two students, chalkboard.

Skills: Aesthetic appreciation, analysis, classification, comparing similarities and differences, computation, description, discussion, generalisation, listing, observing, reading and writing.

Procedure: a) Differentiate vertebrates from invertebrates.

b) Discuss the main characteristics of insects.

c) Relate points of interest to endemic insects.

d) Discuss the benefits of insects.

-

Culminating Activity:

1) Send pairs of students outside to collect grasshoppers.

2) Caution the students not to harm the grasshoppers.

3) Tell students they are going to be like some scientists, carefully observing wildlife, with as little impact as possible on it.

4) Write out questions for students to use in observing their grasshopper.

Eg. a) What are some of the most outstanding features of the grasshopper?

b) How many legs does it have?

c) Which legs are the jumping legs?

d) Where are the legs attached to the body?

e) Do you see a mouth?

f) Where are the antennae?

g) Are the antennae long, string-like, single appendage, or are they made of many parts?

h) Does the grasshopper have lips?

i) Does the grasshopper always walk?

j) Does the grasshopper have wings? (Adults have wings, immature show pads or stumps).

k) Do grasshoppers make noise?

l) Does it make the sound with its mouth or with some other part of its body?

m) Is it the same all over?

n) Where does the grasshopper live?

o) What does it eat?

5) Ask some concluding questions.

Eg. a) Did you think there were so many interesting things about a grasshopper?

b) Do you think other insects might be interesting?

c) What other insects or small animals might be interesting to look at and learn about?

6) Remind students that a grasshopper is only one kind of animal, and that animals, including other forms of wildlife are all shapes and sizes.

7) Ask students to take their grasshoppers outside and let them go.

8) Point out some contributions grasshopper make to the ecological system, eg. food for birds.

WEEK 5

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GRADES 7 TO 9

Topic: Insects

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Source: 1. An Introduction to the Study of Insects by Donald Borror

2. Project Wild by W.R.E.C.C.

Aim: For students to develop an appreciation of insects.

Objectives: 1) To develop students' ability to make scientific deductions from observation.

2) For students to identify the main features of insects.

3) To recognise insects as useful animals.

Materials: Ants, notebook.

Skills: Aesthetic appreciation, analysis, classification, comparing similarities and differences, computation, description, discussion, generalisation, listing, observing, reading and writing.

Procedure: a) Differentiate vertebrates from invertebrates.

b) Discuss the main characteristics of insects.

c) Tell points of interest about endemic insects.

d) Discuss the benefits of insects.

-

Culminating Activity:

The objectives of this exercise are to identify similarities and differences in basic needs of ants and humans, and generalise that humans and wildlife have similar basic needs.

1) Go outside and find some ants. Check sidewalks, near kitchens, on trees, in flower beds, in vacant spots, around windows, etc.

2) Working in teams of three (3) ask the students to observe the ants' behaviours.

- 3) One student in each group should act as recorder, noting the students' observations. Included in their observations should be: evidence of how ants take care of their basic needs; what their basic needs are; and description of ants' behaviour, including how ants walk in a line.
- 4) Remind the students to make their observations without harming the ants.
- 5) After approximately 15 minutes of observation time, gather the groups and ask them to report their findings. Close the discussion with the sharing of a description of an ant's behaviour.
- 6) To demonstrate ant behaviour, get the students into two lines of equal length facing each other in a narrow area. For example, between two lines drawn with chalk on a sidewalk, or on top of a fallen log.
- 7) The object is for the two lines of students to pass each other without falling off.
- 8) The students should simulate ant behaviour based on their earlier observations.

WEEK 6

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GRADE 4.

Topic: Amphibians and Reptiles

Source: 1. Simon and Schuster's Guide to Reptiles

2. Amphibians of the World by Massimo Capulo

3. Reptiles and Amphibians of the Virgin Islands by William McLeai

4. Reptiles and Amphibians Colouring Book by Thomas C. Quirk Jr.

Aim: To remove the unnecessary fear and repugnance of amphibians and reptiles and to replace it with a knowledge of their usefulness to man.

Objective: To make students sympathetic to the loss of habitat of these creatures due to people's ignorance of their importance and beauty.

Materials: Books and magazines showing photos of reptiles and amphibians, writing materials, pencils, live specimen of endemic Jamaican Boa (courtesy of the Hope Zoo), charts.

Skills: Writing, reading, classification, comparing similarities and differences, discussion, invention, description, visualisation, synthesis.

Procedure: 1) Go over the characteristics of Reptiles.

2) Using a chart, point out and write the four main types of reptiles.

3) Discuss and write how they are helpful to man.

4) Discuss why people kill them stressing ignorance and fear; mention their habit of "Reptile Abuse" (eg. our students tried to stab lizards).

5) Give the main features of amphibians, after asking if frogs fit the definition of reptiles.

6) Explain and show pictures of different types of amphibians.

7) Discuss and write how they help us, i.e. their importance in the ecosystem.

8) Discuss reasons for their being endangered, mentioning collection, loss of habitat, fear and their "Amphibian Abuse" (some of our students were reportedly beating a frog to death).

-

Culminating Activity:

1) Go outside. Ask everyone to choose a reptile or an amphibian to think about. Ask everyone to close their eyes for a few minutes and imagine that they are that animal, living in its natural environment. With their eyes closed you can guide their imagination process with a few words - or simply leave this process to the students on their own.

2) Give everyone 5 minutes to find a spot to "become" that animal. Imagine how long it lives, where it travels, how other plants and animals look from its perspective.

When the students return, ask everyone to write a short poem about their animal. Poems can be free verse or rhyming.

3) The completed poems can be typed or printed neatly and then displayed with a photograph or drawing of the animal.

WEEK 6

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GRADES 5 and 6.

Topic: Amphibians and Reptiles

Source: 1. Simon and Schuster's Guide to Reptiles

2. Amphibians of the World by Massimo Capulo

3. Reptiles and Amphibians of the Virgin Islands by William McLeai

4. Reptiles and Amphibians Colouring Book by Thomas C. Quirk Jr.

Aim: To remove the unnecessary fear and repugnance of amphibians and reptiles and to replace it with a knowledge of their usefulness to man.

Objective: To make students sympathetic to the loss of habitats of these creatures due to people's ignorance of their importance and beauty.

Materials: Books and magazines showing photos of reptiles and amphibians, writing materials, live specimen of endemic Jamaican Boa (courtesy of the Hope Zoo), charts.

Skills: Writing, reading, classification, comparing similarities and differences, discussion, invention, description, visualisation, synthesis.

Procedure: 1) Tell students the main features of Reptiles.

2) Using a chart, point out and write the four main types of reptiles.

3) Discuss and write how they are helpful to man.

- 4) Discuss why people kill them, stressing ignorance and fear; mention their "Reptile Abuse" practices, (for example, our students were observed trying to kill lizards).
- 5) Define amphibians after asking if frogs fit the definition of reptiles.
- 6) Explain and show pictures of different types of amphibians.
- 7) Discuss and write how they help man, i.e. their importance in the ecosystem.
- 8) Discuss factors that contribute to their being endangered, mentioning collection, loss of habitat, fear and their "Amphibian Abuse" (for example, our students have been said to beat frogs to death).

-

Culminating Activity:

- 1) Go outside. Ask everyone to choose a reptile or amphibian to think about. Ask everyone to close their eyes for a few minutes and imagine they are the animals, living in its natural environment. With their eyes closed you can guide their imagining process with a few words - or simply leave this process to the students on their own.
- 2) Give everyone five (5) minutes to find a spot to "become" that animal. Imagine how long it lives, where it travels, how other plants and animals look from its perspective. When the students return, ask everyone to write a short poem or song about their animal. Poem *or* song can be free verse or rhyming.
- 3) The completed poems and songs can be typed or printed neatly and then displayed with a photograph or drawing of the animal.

WEEK 6

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GRADES 7 to 9.

Topic: Amphibians and Reptiles

Source: 1. Simon and Schuster's Guide to Reptiles

2. Amphibians of the World by Massimo Capulo

3. Reptiles and Amphibians of the Virgin Island by William McLeai

4. Reptiles and Amphibians Colouring Book by Thomas C. Quirk Jr.

Aim: To remove the unnecessary fear and repugnance of amphibians and reptiles and to replace it with a knowledge of their usefulness to man.

Objectives: To make students sympathetic to the loss of habitat of these creatures due to people's ignorance of their importance and beauty.

Materials: Books and magazines showing photos of reptiles and amphibians, writing materials, pencils, live specimen of endemic Jamaican Boa (courtesy of the Hope Zoo), charts.

Skills: Writing, reading, classification, comparing similarities and differences, discussion.

Procedure: 1) Define reptiles.

2) Using a chart point out and write the four main types of reptiles (lizards, snakes, crocodiles, turtles).

3) Discuss and write how they are beneficial to mankind.

4) Discuss why people kill them stressing ignorance and fear; mention their "Reptile Abuse" - Our students were once seen trying to stab a lizard.

5) Define amphibians after asking if frogs fit the definition of reptiles.

6) Explain and show pictures of different types of amphibians.

7) Discuss and write how they help man, and their importance in the ecosystem.

8) Discuss factors that contribute to them being endangered mentioning collection, loss of habitat, fear and their "frog beating".

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Culminating Activity:

1) Go outside. Ask everyone to choose a reptile or amphibian to think about. Ask everyone to close their eyes for a few minutes and imagine they are the animals, living

in their natural environment. With their eyes closed you can guide their process of imagination with a few words - or simply leave this process to the students.

2) Give everyone five (5) minutes to find a spot to "become" that animal. Imagine how long it lives, where it travels, how other plants and animals look from its perspective. When the students return, ask everyone to write a song or story about their animal. The song or story can be free verse or rhyming.

3) The completed songs or stories can be typed or printed neatly and then displayed with a photograph or drawing of the animal.

WEEK 7

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GRADE 4.

Topic: Birds

Source: 1. W.E.C.A.N. Magazine # 2 by W.E.C.A.N. Youth Club

2. Birds of Jamaica by Audrey Downer and Robert Sutton.

3. Birds of the West Indies by James Bond.

Aims: To increase students' knowledge of the birds around them. To teach them about the importance of birds.

Objectives: i) Students will be able to identify some of the birds in their surroundings.

ii) Students will be able to say how birds help us.

Materials: Books, binoculars, slide projector and slides (courtesy of the Gosse Bird Club).

Skills: Observation, description, discussion, evaluation, animal classification.

Procedure: 1) Ask students if they know the main features of birds.

2) Ask them if bats are birds.

- 3) Ask them why bats are not birds.
- 4) Give students the main features of a bird.
- 5) Give the benefits of birds, for example, birds control insect populations.
- 6) Discuss and point out the benefits of certain birds in their communities.
- 7) List examples of benefits that birds provide and examples of birds that provide these benefits.

-

Culminating Activity:

Activity A

- 1) Give students a slide show on birds. You can attempt this yourself or contact the Gosse Bird Club for a show.
- 2) Birds will be grouped according to some of the benefits they provide to humans. For example, one group would be birds that eat insects, and another would be birds that eat rodents.

-

Culminating Activity:

Activity B

Take students on a bird watch. The Gosse Bid Club may be contacted if teacher is unfamiliar or uncomfortable with bird identification.

WEEK 7

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GRADES 5 and 6.

Topic: Birds

Source: 1. W.E.C.A.N. Magazine # 2 by W.E.C.A.N. Youth Club

2. Birds of Jamaica by Audrey Downer and Robert Sutton.

3. Birds of the West Indies by James Bond.

Aims: To increase students' knowledge of the birds around them. To teach them about the importance of birds.

Objectives: i) Students will be able to identify some of the birds in their surroundings.

ii) Students will be able to say how birds help humans.

Materials: Books, binoculars, slide projector and slides (courtesy of the Gosse Bird Club).

Skills: Observation, description, discussion, evaluation, animal classification.

Procedure: 1) Ask students if they know what a bird is.

2) Ask them if a butterfly is a bird.

3) Ask them why a butterfly is not a bird.

4) Give students the characteristics of a bird.

5) Give benefits of birds, for example, birds control rodent populations.

6) Discuss and point out the benefits of certain birds in their communities.

7) List examples of benefits that birds provide and examples of birds that provides these benefits.

-

Culminating Activity:

Activity A

1) A slide show on birds. If the teacher is uncomfortable with this, a slide show can be given by the Gosse Bird Club.

2) Birds will be grouped according to some of the benefits they provide to humans. For example, one group will be birds that pollinate flowers, and another would be birds that eat insects.

-

Culminating Activity:

Activity B

A bird watch either early in the morning or late in the evening, when the birds are feeding. (Contact the Gosse Bird Club if you are uncomfortable or unfamiliar with the identification of the birds in your area).

WEEK 7

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GRADES 7 to 9.

Topic: Birds

Source: 1. W.E.C.A.N. Magazine # 2 by W.E.C.A.N. Youth Club

2. Birds of Jamaica by Audrey Downer, Robert Sutton.

3. Birds of the West Indies by James Bond.

Aims: To increase students' knowledge of the birds around them. To teach them about the importance of birds.

Objectives: i) Students will be able to identify some of the birds in their environment.

ii) Students will be able to say how birds help people.

Materials: Books, binoculars, slide projector and slides (with the kind courtesy of the Gosse Bird Club).

Skills: Observation, description, discussion, evaluation, animal classification.

Procedure: a) Ask students if they know what a bird is.

- b) Ask them if a particular animal (not a bird) is a bird.
- c) Ask them why is it not a bird.
- d) Tell students the main features of a bird.
- e) Give some of the benefits of birds, for example, birds pollinate flowers.
- f) Discuss and point out the benefits of different birds in the community.
- g) Different types of benefits and birds that provide those benefits are listed for students.

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Culminating Activity:

Activity A

- 1) A slide presentation on birds (contact the Gosse Bird Club for a presentation).
- 2) Birds will be grouped according to some of the benefits they provide to humans. For example, one group will be birds that eat insects and another would be birds that improve fish stock.

-

Culminating Activity:

Activity B

Take students on an early morning or late afternoon bird watch, when the birds are feeding the most. Contact the Gosse Bird Club if you are uncomfortable or unfamiliar with the identification of birds in your area.

WEEK 8

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GRADE 4.

Topic: Plants

Source: 1. Sharing Nature with Children by Joseph Cornell

Aim: To teach students that plants are vital living organisms that are key to the existence of all living things.

Objectives: i) Students will learn the usefulness of plants.

ii) Students will recognise that plants are direct and indirect sources of energy for man.

iii) Students will be able to identify some plants in their surroundings.

Materials: Plant specimens, writing materials.

Skills: Plant identification, aesthetic appreciation, problem solving, observation, synthesis.

Procedure: i) Point out the main features of plants, highlighting photosynthesis as the process that all animals rely on, either directly or indirectly for food.

ii) In promoting discussion, point out the vital role plants play in the ecosystem.

-

Culminating Activity:

1) Collect small samples of leaves, flowers and seeds from trees and bushes - you will need about 7-10 specimens in all.

2) Form two equal teams and line them up facing each other, 30 ft. apart.

3) Put the plant specimens in a row on the ground between the two teams.

4) The teams count off separately, so that each player has a number, therefore players are numbered one, two, three, etc., on each team.

5) Call out the name of a plant represented by one of the specimen lying between the teams, then call out a number. (To add surprise, call the number out of sequence). For example, "The next plant is a yacca tree, and the number is six!"

6) As soon as the "sixes" hear their number called, they race to the specimens, trying to be the first to find the Yacca twig. Every successful player earns two points for his team. Picking up the wrong specimen results in a loss of two points.

WEEK 8

-

GRADES 5 and 6.

Topic: Plants

Source: 1. Sharing Nature with Children by Joseph Cornell

Aim: To teach students that plants are vital living organisms that are key to the existence of all living things.

Objectives: i) Students will learn the usefulness of plants.

ii) Students will recognise that plants are direct and indirect sources of energy for man.

iii) Students will be able to identify some plants in their surroundings.

Materials: Plant specimens, writing materials.

Skills: Plant identification, aesthetic appreciation, problem solving, observation, synthesis.

Procedure: i) State the main features of plants, highlighting photosynthesis as the process that all animals rely on, either directly or indirectly to live.

ii) Promoting discussion, point out the vital role plants play in the ecosystem.

-

Culminating Activity:

1) Collect small samples of leaves, flowers and seeds from trees and bushes - you will need about 7-10 specimens in all.

- 2) Form two equal teams and line them up facing each other, 30 feet apart.
- 3) Put the plant specimens in a row on the ground between the two teams.
- 4) The teams count off separately, so that each player has a number, so that on each team there are players numbered one, two, three, etc.
- 5) Call out the name of a plant represented by one of the specimens lying between the teams, then call out a number. (To add surprise, call the number out of sequence).
"The next plant is mango and the number is six!"
- 6) As soon as the "sixes" hear their number called, they race to the specimens, trying to be the first to find the mango leaves. Every successful player earns two points for his team. If he can name one use of the plant, one additional point is earned. Picking up the wrong specimen results in a loss of two points.

WEEK 8

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GRADES 7 to 9.

Topic: Plants

Source: 1. Sharing Nature with Children by Joseph Cornell

Aim: To teach students that plants are vital living organisms that are key to the existence of all living things.

Objectives: i) Students will learn the usefulness of plants.

ii) Students will recognize that plants are direct and indirect sources of energy for man.

iii) Students will be able to identify some plants in their surroundings.

Materials: Plant specimens, writing materials.

Skills: Plant identification, aesthetic appreciation, problem solving, observation, synthesis.

Procedure: i) Point out the main features of plants, highlighting photosynthesis as the process that all animals rely on, either directly or indirectly for all living processes.

ii) Promoting discussion, point out the vital role plants play in the ecosystem.

-

Culminating Activity:

1) Students are asked to list the foods that they had for dinner the previous day.

2) They trace each item of food back to a plant source. This activity is to reinforce reason four (Ecosystems), see below.

3) They then draw these "traces".

4) They can then generalize that:

a) All animals, including people and wildlife, need food.

b) All animals, including people and wildlife, have plants as a direct or indirect source of food.

WEEK 9

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GRADES 4.

Topic: Things WE can do

Source: 1. W.E.C.A.N. Magazine # 1 by W.E.C.A.N. Youth Club.

2. W.E.C.A.N. Magazine # 2 by W.E.C.A.N. Youth Club.

3. What we can do for our Environment by Environment Canada

Aim: To teach students different ways of preserving the environment, by applying what they have learned over the previous eight weeks.

Objectives: At the end of the week students should be able to:

- i) Give four examples of methods of preserving the environment.
- ii) Say how each of these methods affects the environment.

Materials: Posters, books, charts, juice boxes.

Skills: Analysis, discussion, observation, visualisation, problem solving, synthesis.

Procedure: 1) Review briefly some of the topics already taught in class, for example, Birds, Mammals, Reptiles and Amphibians.

2) Discuss with students ways they think they can help to preserve the environment.

3) Point out other ways they can preserve the environment, for example, not littering and not killing wildlife.

-

Culminating Activity:

Making bird feeders.

- 1) Rinse empty juice box.
- 2) Decorate your feeder, be creative.
- 3) Cut a square hole (3cm x 3cm) in one side of the box.
- 4) Cut another hole opposite to the first one so the bird can see other animals coming who may harm it.
- 5) Cut a 50cm piece of string or wire.
- 6) Tie one end of the string through the top of the box, tie the other end around a branch or clothesline out of the way of cats and other predators.
- 7) Fill the feeder with seeds.
- 8) Be patient, it may take the birds a while to get used to the feeders.
- 9) Encourage students not to try to capture or shoot the birds that feed, reminding them of their importance in the Ecosystem.

10) Be sure that children clean or change the feeders on a regular basis.

WEEK 9

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GRADES 5 and 6

Topic: Things WE can do

Source: 1. W.E.C.A.N. Magazine # 1 by W.E.C.A.N. Youth Club.

2. W.E.C.A.N. Magazine # 2 by W.E.C.A.N. Youth Club.

3. What we can do for our Environment by Environment Canada

Aim: To teach students different ways of preserving their environment, by applying what they have learned over the previous eight weeks.

Objectives: At the end of the week students should be able to:

- i) Give six examples of methods of preserving the environment.
- ii) Say how each of these methods affects the environment.

Materials: Posters, books, charts, seedlings, digging implements.

Skills: Analysis, discussion, observation, visualisation, problem solving, synthesis.

Procedure: 1) Review briefly some of the topics already taught in class. For example, Birds, Mammals, Reptiles and Amphibians.

2) Discuss with students, ways they think they can help to preserve the environment.

3) Point out other ways they can preserve the environment, for example, not littering and not killing wildlife.

-

Culminating Activity:

Tree Planting

1. Plant native trees in the school yard or community. Seedlings can be had from the Forestry Department.
2. Be sure children continue to water and care for plants, reminding them of the importance of plants.

WEEK 9

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GRADES 7 to 9.

Topic: Things WE can do

Source: 1. W.E.C.A.N. Magazine # 1 and 2 by W.E.C.A.N. Youth Club.

2. What we can do for our Environment by Environment Canada

Aim: To teach students different ways of preserving their environment, by applying what they have learned over the previous eight weeks.

Objectives: At the end of the week students should be able to:

- i) State eight methods of preserving the environment.
- ii) Say how each of these methods affects the environment.

Materials: Posters, books, charts, waste material.

Skills: Analysis, discussion, observation, visualisation, problem solving.

Procedure: 1) Review briefly some of the topics already taught in class, for example, Birds, Mammals, Reptiles and Amphibians.

- 2) Discuss with students ways they think they can help to preserve the environment.

- 3) Point out other ways they can preserve the environment, for example, not littering and not killing wildlife.

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Culminating Activity:

Activity A: Garbage Separation and Composting

- 1) Put the following in separate garbage containers: plastic, paper, tin, glass and organic matter.
- 2) Dig a hole.
- 3) Place organic material in this hole adding adequate water and soil and mixing them together whenever new organic matter is put in.
- 4) In a few weeks the material in the compost heap can be used as plant fertilizer.

Activity B

Collect and return glass bottles for them to be reused.

Activity C

As no plastic and recycling plants are presently in operation, get students to write to the appropriate authorities (Ministers of Environment, Health, and Local Government) to implement recycling programmes.

Activity D

Students will be encouraged to be creative, turning "garbage" into useful objects or art work.

III. CONCLUSIONS AND RECOMMENDATIONS

The teacher's notes included are meant to aid the teacher in the initial phases of teaching Environmental Science. These are not **the only** information on the various topics. The amount of research done will depend mainly on the teacher's time and interest. The greater his interest and enthusiasm, the greater it will be for his students. Although accessing photographs of Jamaican endemic species, or easy-to-read documentation in **one** volume may be difficult, it is to be remembered that there is oftentimes sufficient information on endemic species to prepare interesting and

informative classes. Several organisations will be able to offer expertise, knowledge and practical skills and are of great help in providing additional information. They may be asked to make presentations or demonstrations, which can add extra interest to your lessons. Some of these organisations include:

The Gosse Bird Club

(Information on Jamaican Birds/slide show presentations)

2 Starlight Avenue

Kingston 6

809-927-8444

Wildlife and Environmental Conservation Action Now (W.E.C.A.N.) Youth Club

(Paper re-cycling demonstrations/children's environmental magazines)

c/o Hope Zoo

Hope Gardens

Kingston 6

809-927-1085

The Hope Zoo

(Information on Jamaican endemic species)

Hope Gardens

Kingston 6

809-927-1085

Conservation Data Centre

(Status of nearly **all** Jamaican flora and fauna)

University of the West Indies

Kingston 6

Botany Department

(Identification of plant specimens)

University of the West Indies

Kingston 6

809-927-2753

Many of these groups may be able to supply posters of some Jamaican animals. Poster production (by students and teachers) is encouraged. If pictures of certain Jamaican species cannot be had, try drawing or printing, pictures of those in books and magazines. Some good sources of information include:

"The Jamaica Naturalist", Volumes 1 & 2 - The Natural History Society of Jamaica

"The Conservation Strategy For the Jamaican Iguana" - Dr. Peter Vogel

"Birds of Jamaica" - Audrey Downer, Robert Sutton

"Familiar Jamaican Birds", Parts 1 & 2 - Anna Black

Materials listed in the lesson plans, that are not available, should be improvised.

Teachers may want to experiment with lessons by trying them out on different grades, for example, using a lesson prepared for a grade 4 on grades 5 and 6 or vice versa, as lessons in this manual were taught based on the groups (number of grades) of students we were assigned to teach at a given time, at Jack's Hill All Age. Very few changes have been made to the original lesson plans used there, so results should all be positive. If you cannot experiment with all the grades represented, try to work with younger children, as they tend to be more keen, interested and are influenced easier than the older children. You will find too, that the lesson plans for each grade follows a very similar pattern, however you will discover that you will end up teaching the younger children much less than you had set out to, but as long as the conservation message is clear, this should not be a problem. You will also discover that different age groups will produce different responses to the same material - the older they get the more complex and synthesised the response. The following is a report of the first week of lessons (21-22 September 1992) by topic and grade:

Report on the first week of lessons

1. Environmental Terms - Grade 4: In general the students were enthusiastic. They seemed to be aware and excited about the things around them, for example, someone gave a good description of a "Petchary attacking a Chicken Hawk". The students got practice writing and familiarising themselves with the spellings of the words. They were excited by the game which tested their pronunciation and understanding of the words. Their dramatisation was limited to all members of each group flapping their arms as wings and running in circles. Other groups had each person doing the same action for the 60 second period. Many groups did very similar actions to display different words. They did not always organise themselves well enough so that **all** members of the group could participate and help bring out the meaning of the word. They could not conceptualise the difference between "wild" and "domestic".

2. Environmental Terms - Grades 5 and 6: They seem quicker than the grade 4 class. They were enthusiastic and excited, so much that people often raised their hands and made comments irrelevant to the discussion. They enjoyed the game very much. Their mimes were by far more imaginative than the grade 4's. They showed better organisation and understanding of the words they were portraying. One very good mime was "pollution". However, they seemed only to be guessing words they had learned instead of trying to judge what the mimers were portraying. They did not seem as in tuned with nature as the grade fours.

3. Environmental Terms - Grades 7 - 9: They were relatively unresponsive, very much unlike the grades 4 -6. Two students showed a previous knowledge of some of the words taught.

So similar lesson plans (input) does not mean similar response (output).

You should consider keeping groups small, if it is any at all possible, as much more is accomplished with smaller groups.

Activities done in groups, were used to develop and facilitate team work, which we feel is of vital importance, not only in environmental conservation but for the general progress of Jamaica. When bringing in living specimens collect only what is necessary. Release animals in the exact area of capture after use. Do not collect endangered species.

Some of the environmental programmes presently being run in Jamaica employ various methods of sending the message across to their audience in the ways they find most effective. Some profess that environmental education in the classroom is a definite "no-no". In a North American setting, where the educational system is different, this may be perfect. We believe that many of the techniques used may be so

"foreign" to the students, that they become so fascinated with the technique that they miss the message.

The lessons in the manual have included a theoretical part, which includes writing and discussion, and a culminating activity, which usually involves a game or various media of creative expression. Teachers should not be afraid to use the chalkboard as an aid to teach environmental science, but as with all other subjects it should not be the **sole** method used. Take books, drawings, charts and, as much as possible, specimens to class to illustrate your points.

We found that the older children felt uncomfortable playing games as they thought it was "childish". For this reason the manual does not include many games for the grades 7-9. We tended to do a lot of discussion and writing exercises with them. Other teachers may not receive this response from their older students and may use games as part of their culminating activities.

Teachers should aim at spending at least one hour on each part of the lesson per week making up their own games and taking children outdoors for lessons, especially the culminating activity, which should be done as often as possible.

In the lesson plans we have incorporated BOTH: (1) traditional methods in Jamaica, which is generally a notebook/chalkboard situation; and (2) un-orthodox Jamaican methods of teaching which includes games and the use of art and mimes as teaching aids. We justify the use of the notebook by the following :

- (i) students use notes as references in later lessons
- (ii) Students will not take the subject as a free period but will take it just as seriously as his other classes, even though it is more fun.

Games were found to promote the learning process as students became eager to absorb the information, as they knew they would need it in their games in order for their teams to win.

Teachers may find that time goes quickly during the class periods and after his first week, may need to reduce the amount of material to be covered - this is especially true in the younger groups.

Should you realise that your class has difficulty differentiating between domestic and wild animals, as ours did, you may need to take a few minutes to explain the difference, or schedule this as a complete class period. The following definitions may prove helpful:

domestic - kept by or living with man; as a source of products or pets

tame - make gentle or domesticate

wild - not kept by or living with man; shy; easily startled; hard to get near; it is free, provides food, shelter and other needs in an environment that serves as a suitable habitat (home): not domesticated or tame.

feral - in a wild state after escape from captivity

Teacher's may need to get a general overview of waste management (recycling, reusing).

If you ever decide to give your class a written test, do not be led to believe that this is a true indication of your students' progress - it may just be an indicator of your student's literacy level. We found students who did not do well in games and discussions, do well on their tests, because they had better reading and writing skills than the sharpest students.

Often in the middle of explaining certain things to our students they would sometimes say that they would stop doing certain things that lead to environmental destruction. Soon, they began to name their classmates who were "guilty" of certain practices.

One evening, we were as usual walking home with one of our grade 6 students who started giving us a graphical description of how he tried to kill a parakeet. On hearing this, Garfield asked him if he knew the importance of the bird and why it shouldn't be harmed. The young man quickly rattled off all the reasons we had given in class, then continued to tell his gruesome story. For a few minutes we were stupefied, as this child was generally quiet in class and had not received any of the top test scores - but it made us feel good. I wondered if he went home and shared what he learned in class with his parents and wondered if the length of the programme was extended, would it be successful enough to convert even this boy, to move from knowledge to positive action. Maybe he does not understand the FULL implications now, but with a basis like this, maybe in four or five years he will sit in his room and remember his environmental classes and it may suddenly hit him as he thinks, "So that's what they meant ...". It doesn't take a miracle to bring a change in attitude - all it takes is a little education, it DOES go a long way.

IV. TEACHER'S NOTES (GLOSSARIES)

Actual words taught are listed in the top sections of the vocabulary. The remainder may be done if time allows or may be taught or introduced in other lessons, as we did.

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GRADE 4 - Environmental Terms

Herbivore - a plant eater, eg. cow.

Carnivore - a meat eater, eg. lion.

Omnivore - an animal that eats both plants and meat, eg. man.

Extinct - no longer exists, eg. Black Racer (Jamaican endemic snake).

Predator - an animal that catches and eats living animals, eg. Jamaican Boa.

Prey - animals that are killed and eaten by other animals, eg. rats.

Range - area where animal is found.

Endemic - found *only* in a specific area.

Endangered - there are so few that they may become extinct.

Nocturnal - active at night.

.....

Pollution - harmful substances put in the air, water or land, leading to a state of dirtiness or sickness; for example, garbage in gullies and empty lots, smoke rising from factories, rubbish dumps.

Habitat - natural home of animal that provides it with its needs (food, water, shelter, light, space) eg. pond.

Shelter - cover

Indigenous - found naturally in a particular place; not introduced.

Threatened - numbers are getting low enough that the animal could become endangered.

Environment - the physical, chemical and biological conditions of the region in which the organism lives; the sum total of all the conditions in which an organism exists i.e. the organic (of living things) and the inorganic (light, physical temperature, rainfall, etc).

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GRADES 5 AND 6 - Environmental Terms

Herbivore - a plant eater, eg. cow.

Carnivore - a meat eater, eg. lion.

Omnivore - an animal that eats both plants and meat, eg. man.

Extinct - no longer exists, eg. Giant Yellow Galliwasp (Jamaican endemic amphibian).

Pollution - harmful substances put in the air, water or land, leading to a state of dirtiness or sickness for example, garbage in gullies and empty lots, smoke rising from factories, rubbish dumps.

Habitat - natural home of animal that provides it with its needs (food, water, shelter, light, space) for example, pond.

Range - area where animal is found.

Endemic - found only in a specific area.

Endangered - there are so few that they may become extinct.

Nocturnal - active at night.

Environment - the physical, chemical and biological conditions of the region in which the organism lives; the sum total of all the conditions in which an organism exists ie. the organic (biotic) and the inorganic (abiotic).

.....

Predator - an animal that catches and eats living animals, for example, Chicken Hawk.

Prey - animals that are killed and eaten by other animals, for example, rats.

Shelter - cover

Indigenous - found naturally in a particular place, not introduced.

Threatened - numbers are getting low enough that the animal could become endangered.

Words taught are listed in the top section of the vocabulary. The remainder may be done if time allows or may be taught or introduced in other lessons.

TEACHER'S NOTES

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GRADES 7 TO 9 - Environmental Terms

Food Chain - is a sequence of organisms through which the energy in food passes from plants to animals and then to other animals in series, for example, Cabbage ----> caterpillar ----> pechary.

Species - a group of individuals that are more or less alike, and that are able to breed and produce fertile offspring under natural conditions.

Deforestation - removal of vegetative cover (trees) from an area. Deforestation is usually carried out to provide materials for the lumber and charcoal industries, as well as land for subsistence or exotic crops, eg. coffee.

Extinct - no longer exists, eg. Jamaican Pauraque (Jamaican endemic bird).

Pollution - harmful substances put in the air, water or land, leading to a state of dirtiness or sickness, for example, garbage in gullies and empty lots, smoke rising from factories, rubbish dumps.

Habitat - natural home of animal that provides it with its needs (food, water, shelter, light, space) eg. pond.

Range - area where animal is found.

Endemic - found only in a specific area.

Endangered - there are so few that they may become extinct.

Nocturnal - active at night.

Environment - the physical, chemical and biological conditions of the region in which the organism lives.

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Commensalism - a relationship between two organisms where one derives benefits from the other. The other organism neither benefits nor is harmed in any way by the association.

Mutualism - a close relationship between two different organisms where both benefit from the relationship (eg. cow and gaulin).

Parasitism - a relationship in which an organism (the parasite) feeds on the living body of another organism (the host). A successful parasite is able to live with the host without causing it any real harm, thereby ensuring its own future, eg. tapeworm in the gut of man.

Ecosystem - a community of living organisms, the region in which they occupy (their habitat), their interactions with each other, with the physical environment and the flow of energy and matter through the system.

Threatened - numbers are getting low enough that the animal could become endangered.

Words taught are listed in the top section of the vocabulary. The remainder may be done if time allows or can be taught or introduced in other lessons.

TEACHER'S NOTES

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GRADE 4 - Reasons for preserving the environment

1. Compassion - other species also have a right to exist, that the needs and desires of human beings are not the only basis for ethical decisions.
2. Aesthetics - species should be preserved because of their beauty, symbolic value or intrinsic interest.

Many animals are used to symbolise qualities eg. Dove - peace. Plants and animals are inspiration for drawings, poems, stamps, etc., for example, birds, butterflies, flowers, and fishes.

3. Economics - other species provide direct benefits to man and should be saved for that reason, for example, plants.

a) Periwinkle - contains vincristine, which has been proven to be effective in treating Hodgkin's disease, a leukemia-like disorder. Total sale of vincristine worldwide in 1979 was US \$35 million.

b) Cinchona - contains quinine, which was once the main treatment for malaria.

c) Rauwolfia - contains reserpine which is used in the control of high blood pressure.

d) Opium Poppy - contains morphine, codeine and heroin used in painkillers.

In 1980 total sales for plant derived medicines was US \$6 billion. Banana, plantain, vegetables, root crops and grain are some of the most frequently eaten foods. Additional products from plants include: dyes, cotton, rubber, spices, perfume and wood for lumber and fuel.

e) Animal flesh is the main contributor of protein in most people's diet. The main sources being cattle, pigs, goats, sheep, chicken and fish.

f) Cytarabine derived from a sponge is used for the treatment of leukemia.

4. Ecosystems - other species are living components of vital ecological systems which provide humans with indispensable free services. This is the most important reason, for whatever befalls other species, eventually befalls man, for example:

a) Birds help in the control of insect populations, control of rodents, removal of carcasses, seed dispersal, etc.

b) Snakes help to control rodent, and some bird populations.

c) Crocodiles help to maintain a healthy fish stock by eating sick and weak fishes.

TEACHER'S NOTES

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GRADES 5 AND 6 - Reasons for preserving the environment

1. Compassion - other products of evolution also have a right to exist, that the needs and desires of human beings are not the only basis for ethical decisions.
2. Aesthetics - species should be preserved because of their beauty, symbolic value or intrinsic interest.

Many animals are used to symbolise qualities eg. the owl - wisdom. Plants and animals are inspiration for paintings, literature, dance, etc., for example, birds, flowers, fishes and insects.

3. Economics - other species provide direct benefits to man and should be saved for that reason.

Economical benefits of plants.

- a) Periwinkle - contains vincristine, which has been proven to be effective in treating Hodgkin's disease, a leukemia-like disorder. Total sale of vincristine worldwide in 1979 was US \$35 million.
- b) Cinchona - contains quinine, which was once the main treatment for malaria.
- c) Rauwolfia - contains reserpine which is used in the control of high blood pressure.
- d) Opium Poppy - contains morphine, codeine and heroin used in painkillers.

In 1980 total sales for plant derived medicines was US \$6 billion. Banana, plantain, vegetables, root crops and grain are some of the most frequently eaten foods. Additional products from plants include, dyes, cotton, rubber, spices, and wood for lumber and fuel.

Economical benefits of animals.

- a) Animal flesh is the main contributor of protein in most people's diets. The main sources being cattle, pigs, goats, sheep, chicken and fish.
 - b) Cytarabine derived from a sponge is used for the treatment of leukemia.
4. Ecosystems - other species are living components of vital ecological systems which provide humans with indispensable free services. This is the most important reason, for whatever befalls other species, eventually befalls man, for example:

- a) Bats help by way of seed dispersal, also their faeces is sometimes used as manure.
- b) Butterflies pollinate flowers, which develop into food.

TEACHER'S NOTES

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GRADES 7 TO 9 - Reasons for preserving the Environment

1. Compassion - other products of evolution also have a right to exist, that the needs and desires of human beings are not the only basis for ethical decisions.
2. Aesthetics - species should be preserved because of their beauty, symbolic value or intrinsic interest, for example, birds, mammals, flowers, fishes and insects. Some scientists find beauty in the markings on wings of disease-carrying mosquitoes. Plants and animals are inspirations for visual and performing arts. Tourists, who we earn most of our foreign exchange come to see our rare and beautiful plants, animals and their habitats.
3. Economics - other species provide direct benefits to man and should be saved for that reason.

Economic benefits of plants

- a) Periwinkle - contains vincristine, which has been proven to be effective in treating Hodgkin's disease, a leukemia-like disorder. Total sale of vincristine worldwide in 1979 was US \$35 million.
- b) Cinchona - contains quinine, which was once the main treatment for malaria.
- c) Rauwolfia - contains reserpine which is used in the control of high blood pressure.
- d) Opium Poppy contains morphine, codeine and heroin used in painkillers.

In 1980 total sales for plant derived medicines was US \$6 billion. Banana, plantain, vegetables, root crops and grain are some of the most frequently eaten foods. Additional products from plants include, dyes, cotton, rubber, spices, perfume and wood for lumber and fuel.

Economic benefits of animals

a) Animal flesh is the main contributor of protein in most people's diets. The main sources being cattle, pigs, goats, chicken and fish.

b) Cytarabine derived from a sponge is used for the treatment of leukemia.

4. Ecosystems - other species are living components of vital ecological systems which provide humans with indispensable free services. This is the most important reason, for whatever befalls other species, eventually befalls man, for example,

a) Birds help in the control of insect populations, control of rodents, removal of carcasses, seed dispersal, etc.

b) Snakes help to control rodent and some bird populations.

TEACHER'S NOTES

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GRADE 4 - Endangered Endemic Jamaican Animals

Jamaican endemics that have become extinct include, the Jamaica Rice Rat, Giant Yellow Galliwasp, Jamaican Pauraque and the Jamaican race of the Black-capped Petrel.

Factors that have contributed to their extinction include, feral cats, dogs and pigs, mongooses, and man.

<u>Jamaican Endemics</u>			
Group	Total	Endangered	% Endangered
Fish	4	4	100
Amphibians	21	16	76
Reptiles	23	19	83
Birds	25	18	72

Mammals	3	3	100
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Endangered Animals Reasons for their present status

Indian Coney Hunted for food, destruction of habitat, killed by mongooses.

Yellow Snake Killed out of fear, killed by mongoose, destruction of habitat.

Yellow-billed Parrot Collected for pet trade, shot for food, destruction of habitat, shot as pest.

Jamaican Iguana Charcoal burners destroy habitat, housing developments, killed by mongooses; wild dogs and pigs.

Giant Swallowtail Deforestation; caught and sold to collectors (US \$3,000).

Butterfly

TEACHER'S NOTES

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GRADES 5 AND 6 - Endemic Endangered Animals of Jamaica

Jamaican endemics that have become extinct include: the Jamaican Rice Rat, Giant Yellow Galliwasp, Jamaican Pauraque and the Jamaican race of the Black-capped Petrel.

Factors that have contributed to their extinction include: feral cats, dogs and pigs, mongooses, and man.

<u>Jamaican Endemics</u>			
Group	Total	Endangered	% Endangered
Fish	4	4	100

Amphibians	21	16	76
Reptiles	23	19	83
Birds	25	18	72
Mammals	3	3	100

Endangered Animals Reasons they are endangered

Indian Coney Hunted for food, destruction of habitat, and killed by mongooses.

Yellow Snake Killed out of fear, killed by mongoose, destruction of habitat.

Yellow-billed Parrot Collected for pet trade, shot for food, destruction of habitat, shot as pest.

Black-billed Parrot Collected for pet trade, shot for food, destruction of habitat, shot as pest.

Jamaican Iguana Charcoal burners destroy habitat, housing developments, killed by mongooses, wild dogs and pigs.

Giant Swallowtail Deforestation, caught and sold to collectors (US \$3,000).

Butterfly

Ring-tailed Pigeon Hunted by man for food, collected for pet trade, deforestation, replacing natural forest with exotic trees (eg. Caribbean Pine) that are not beneficial to this species.

TEACHER'S NOTES

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GRADES 7 TO 9 - Endemic Endangered Animals of Jamaica

Names of Animals given in culminating activity:

West Indian Manatee, Giant Swallowtail Butterfly, Jamaican Pauraque, Mongoose, Jamaican Iguana, Ring-tailed Pigeon, Doctor Bird, Crocodile, Cat and Jamaican Boa.

Factors given for culminating activity:

- cutting down of trees
- collecting for pets
- hunted by man for food
- replacing natural forest
- shot because they are considered pests
- over-collected
- killed out of fear
- housing developments
- killed by mongoose
- killed by wild pigs, cats and dogs.

Endemic Endangered Animals of Jamaica

Jamaican endemics that have become extinct include: the Jamaican Rice Rat, Giant Yellow Galliwasp, Jamaican Pauraque and the Jamaican race of the Black-capped Petrel.

Reasons that have contributed to their extinction include: feral cats, dogs and pigs, mongooses, rats and man.

Jamaican Endemics

Group	Total	Endangered	% Endangered
Fish	4	4	100
Amphibians	21	16	76
Reptiles	23	19	83
Birds	25	18	72
Mammals	3	3	100

Endangered Animals Reasons they are endangered

Indian Coney Hunted for food, destruction of habitat, killed by mongooses.

Jamaican Boa Killed out of fear, killed by mongoose for food, destruction of habitat.

Yellow-billed Parrot Collected for pet trade, shot for food, destruction of habitat; shot as pest.

Black-billed Parrot Collected for pet trade, shot for food, destruction of habitat, shot as pest.

Jamaican Iguana Charcoal burners destroy habitat, housing developments, killed by mongooses, wild dogs and pigs.

Giant Swallowtail Butterfly Deforestation, caught and sold to collectors (US \$3,000).

Ring-tailed Pigeon Hunted by man for food, collected for pet trade, deforestation, replacing natural forest with exotic trees (eg. Caribbean Pine) that are not beneficial to this species.

Jamaican Blackbird Deforestation, replacing natural forest with exotic trees (eg. Caribbean Pine) that are not beneficial to this species.

TEACHER'S NOTES

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GRADE 4 - Mammals

Characteristics: Mammals are warm-blooded animals that breast feed their young. Their bodies are usually covered with hair or fur. Sweat glands are usually present. Domesticated mammals found in Jamaica include: dogs, cats, goats, sheep and cows.

Mammals living in the wild include: the Indian Coney, Mongoose, Bats, Rats and Manatees.

Sample Notes:-

Man is a mammal.

Mongoose - found in Jamaica.

- not endemic.

- harmful because it eats chickens and wild animals that help us.

Fruit Bats - found in Jamaica.

- help us by spreading seeds that grow into trees.

- their droppings are used as fertilizers.

Indian Coney - endemic to Jamaica.

West Indian Manatees - not endemic.

- help us by keeping waterways clear of weeds.

TEACHER'S NOTES

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GRADES 5 AND 6 - Mammals

Characteristics: Mammals are warm-blooded animals that breast feed their young. Their bodies are usually covered with hair or fur. Sweat glands are usually present. Domesticated mammals found in Jamaica include: dogs, cats, goats, sheep, and cows.

Mammals living in the wild include: the Indian Coney, Mongoose, Bat, Rats and the West Indian Manatees.

Sample Notes:-

Man is a mammal.

Mongoose - found in Jamaica (introduced).

- not endemic.

- harmful because it eats chickens and wild animals that help us.

Fruit Bats - found in Jamaica.

- help us by spreading seeds that grow into trees.

- their droppings are used as fertilizers.

Indian Coney - endemic to Jamaica.

- endangered.

West Indian Manatee - not endemic.

-helps us by keeping water ways clear of weeds.

- endangered.

TEACHER'S NOTES

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GRADES 7 TO 9 - Mammals

Characteristics: Mammals are warm-blooded animals that breast-feed their young. Their bodies are usually covered with hair or fur. Sweat glands are usually present.

There are three types of mammals in the world, namely:-

(a) monotremes - lay eggs;

(b) marsupials - babies are half developed at birth, then they crawl into a pouch, to develop further;

(c) placental - babies are fully developed at birth.

Domesticated mammals found in Jamaica include: dogs, cats, goats, sheep, pigs, donkeys, horses, rabbits, guinea pigs and cows.

Mammals living in the wild include the Indian Coney, Mongoose, Fruit Bats, Rats and the West Indian Manatee.

Sample Notes:-

Man is a mammal.

Rats - not endemic to Jamaica.

- harm us by eating our food.
- harm us by spreading disease.

Mongoose - found in Jamaica (introduced).

- not endemic.
- harmful because it eats chickens and wild animals that help us.
- helps us by killing rats that spread disease.

Fruit Bats - found in Jamaica.

- help us by spreading seeds that grows into trees.
- their droppings are used as fertilizers.

Indian Coney - endemic to Jamaica.

- endangered.

West Indian Manatee - not endemic.

- helps us by keeping waterways clear of weeds by feeding on them.

TEACHER'S NOTES

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GRADE 4 - Insects

- a) Vertebrates are animals with backbones, for example, dogs, frogs, doctor birds, fishes.
- b) Invertebrates have no backbones, for example, crabs, earthworm, crickets, slugs, spiders.
- c) Insects are invertebrates.
- d) Main Features of Insects:
 - 1) Body divided into three main parts: Head, thorax, and abdomen.
 - 2) Six legs (Spider is not an insect).
 - 3) Two pairs of wings.
 - 4) Two feelers (antennae).
- e) Examples of insects: bees, grasshoppers, butterflies, moths, roaches.

There are several endemic insects in Jamaica, for example, Giant Swallowtail Butterfly and Fiddler Beetles. One of Jamaica's largest diving insects is the Giant Water beetle which feeds on other insects, tadpoles and even small fishes.

Giant Swallowtail Butterfly - endangered.

- largest butterfly in Western Hemisphere.

- found in Millbank, Portland and in the Cockpit Country, Trelawny.

- threatened by illegal collecting.

How insects help man:

- 1) Many useful commercial products (eg. honey and silk) are derived from insects.
- 2) Insects are the sole or major item of food of many birds, fishes and other animals (including man in some parts of the world).
- 3) Insects have been used in the treatment of certain diseases and in medicine and in surgery.
- 4) The study of insects has helped scientists solve problems in scientific research.
- 5) Insects have aesthetic value to artists and designers who have made use of their beauty.
- 6) Study of insects as a hobby.
- 7) Insects living in the soil cause aeration and enrichment of the soil.

TEACHER'S NOTES

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GRADES 5 AND 6 - Insects

- a) Vertebrates are animals with backbones, for example, cats, lizards, fish.
- b) Invertebrates have no backbones, for example, lobsters, earthworms, snails, grasshoppers, spiders.
- c) Insects are invertebrates.
- d) Main Features of Insects:
 - 1) Body divided into three main parts: Head, thorax, and abdomen.
 - 2) Six legs (Spider is not an insect).
 - 3) Two pairs of wings.
 - 4) Two feelers (antennae).

e) Examples of insects: bees, grasshoppers, flies, crickets, butterflies, moths, roaches, caterpillars.

There are several endemic insects in Jamaica, for example, Giant Swallowtail Butterfly and Fiddler Beetle. There are three (3) types of praying mantis in Jamaica. One of Jamaica's largest diving insects is the Giant Water beetle which feeds on other insects, tadpoles and even small fishes.

Giant Swallowtail Butterfly - endangered.

- largest butterfly in Western Hemisphere.

- found in Millbank, Portland and in the Cockpit Country, Trelawny.

- threatened by illegal collecting.

How insects help man:

1) Many useful commercial products (eg. honey and silk) are derived from insects.

2) Insects are destroyers of undesirable plants.

3) Insects clean up refuse, leaving the world a little more pleasant.

4) Insects are the sole or major item of food of many birds, fishes and other animals (including man in some parts of the world).

5) Insects have been used in the treatment of certain diseases and in medicine and in surgery.

6) The study of insects has helped scientists solve problems in scientific research.

7) Insects have aesthetic value to artists and designers who have made use of their beauty.

8) Study of insects as a hobby.

9) Insects living in the soil cause aeration and enrichment of the soil.

TEACHER'S NOTES

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GRADES 7 TO 9 - Insects

a) Vertebrates are animals with backbones, for example, goats, snakes, turtles, fish.

b) Invertebrates have no backbones, for example, shrimps, earthworms, crickets, mosquitoes, spiders.

c) Insects are invertebrates.

d) Main Features of Insects:

1) Body divided into three main parts: Head, thorax, and abdomen.

2) Six legs (Spider is not an insect).

3) Two pairs of wings.

4) Two feelers (antennae).

e) Examples of insects: bees, grasshoppers, flies, crickets, butterflies, moths, roaches, caterpillars, beetles, termites, dragonflies, damselflies, lice, fleas.

There are several endemic insects in Jamaica, for example, Giant Swallowtail Butterfly and Fiddler Beetle. There are three (3) types of praying mantis in Jamaica. There are five species of paper wasps in Jamaica. One of Jamaica's largest diving insects is the Giant Water beetle which feeds on other insects, tadpoles and even small fishes.

Giant Swallowtail Butterfly - endangered.

- largest butterfly in Western Hemisphere.

- found in Millbank, Portland and in the Cockpit Country, Trelawny.

- threatened by illegal collecting.

How insects help man:

- 1) Without insect pollinators, we would have few vegetables and fruit, therefore less beef and mutton; no coffee; few flowers which is integral to civilization and our domestic economy.
- 2) Many useful commercial products (eg. honey and silk) are derived from insects.
- 3) Some insects are predators or parasites of other insects. This is important in controlling certain (pest) populations.
- 4) Insects are destroyer of undesirable plants.
- 5) Insects clean up refuse, leaving the world a little more pleasant.
- 6) Insects are the sole or major item of food of many birds, fishes and other animals (including man in some parts of the world).
- 7) Insects have been used in the treatment of certain diseases and in medicine and in surgery.
- 8) The study of insects has helped scientists solve problems in scientific research.
- 9) Insects have aesthetic value to artists and designers who have made use of their beauty.
- 10) Study of insects as a hobby.
- 11) Insects living in the soil cause aeration and enrichment of the soil.

TEACHER'S NOTES

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GRADE 4 - Amphibians and Reptiles

Amphibian means "having two lives".

-

Characteristics of Amphibians:

- 1) They have no scales, feathers or fur on their bodies.
- 2) They spend much of their lives on land.
- 3) Body covered by a thin, flexible and usually naked, moist, slimy skin.

Examples of amphibians are frogs, salamanders, newts and toads.

-

Facts about amphibians:

- 1) Aquatic and fish-like when young but leave for land when they become adults.
- 2) When the surroundings are warm, so are they, which makes them very active. When cold, the temperature is low, which reduces them to a state of inactivity.
- 3) In Jamaica there are 18 endemic amphibians out of the 23 that are found here.

-

Amphibians are different from other vertebrates in the following ways:

- 1) Eggs must be laid in water.
- 2) Only partially adapted to terrestrial life.
- 3) Cold-blooded.

Factors that contribute to amphibians becoming endangered include, collection, habitat destruction, fear.

-

How amphibians are important:

- 1) They help us by eating worms (crop pests) and insects.
- 2) They are food for many birds, reptiles and mammals.

Toads - dry warty skin

Frogs - damp smooth skin

Salamanders - small weak limbs and tails that can regenerate. Newts - Newts - types of salamanders

Amphibians are found all over the world in ponds, streams, woods and caves but not in sea water (they cannot tolerate salt).

REPTILES

-

Characteristics of Reptiles:

- 1) Variable body temperature (cold blooded).
- 2) Land dwelling (completely adapted to terrestrial life).
- 3) Scaly bodies (skin covered with scales) or tough and bony hide, for example, Lizards, tortoises, snakes, crocodiles and turtles.
- 4) Gills never develop.

-

Facts about reptiles:

- 1) Size range from land turtles (tortoises) which weigh more than 500 lbs. to small lizards and worm-like snakes.
- 2) Some persons develop a fear of reptiles, especially snakes. This fear stems primarily from misunderstanding.
- 3) Reptiles, like most other animals, attack other living things mainly for food or out of fear. They try to hide or escape from trouble, but if the threat is sudden or close, they resort to other behaviour. Many hiss loudly or make other noises to frighten off an intruder.
- 4) If they become too warm in the sunlight, they move to shade or burrow under a rock. On cold days, they expose themselves to as much sunlight as they can get.
- 5) There are 39 reptiles in Jamaica, of which 26 are endemic.

6) Alligators are not found in Jamaica, only crocodiles.

7) Two (2) extinct endemic Jamaican reptiles are the Giant Galliwasp and the Black Racer.

There are over five (5) species of snakes in Jamaica. They are neither poisonous nor aggressive.

-

How reptiles are important:

1) Crocodiles eat sick and weak fish.

2) Alligators keep water bodies from stagnating by digging holes.

3) Snakes eat rats and mice, which are pests that aid in spreading disease.

4) Lizards eat injurious insects, and are the food of other animals (eg. Chicken Hawks).

-

Why some reptiles are endangered:

1) Increasing scarcity of many species of reptiles marked by widespread slaughter of crocodiles and snakes, mainly for their skins.

2) Filching of eggs and hunting of adult marine turtles.

3) Export of tortoises, lizards and snakes destined to a miserable existence in collectors' tanks.

4) The continuous insensate killing of venomous snakes which results in the murder of thousands of absolutely harmless species (eg. The Yellow Snake).

TEACHER'S NOTES

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GRADES 5 AND 6 - Amphibians and Reptiles

Amphibian means "having two lives".

-

Characteristics of Amphibians:

- 1) They have no scales, feathers or fur on their bodies.
- 2) They spend much of their lives on land.
- 3) Body covered by a thin, flexible and usually naked, moist, slimy skin.
- 4) Immature or Larval forms are herbivorous, adults are usually carnivorous.
- 5) Eggs are fertilized externally as soon as they are laid.

Examples of amphibians are frogs, salamanders, newts and toads.

-

Facts about amphibians.

- 1) Aquatic and fish-like when young but leave for land when they become adults.
- 2) When the surroundings are warm, so are they, which makes them very active. When cold, the temperature is low, which reduces them to a state of inactivity.
- 3) In Jamaica there are 18 endemic amphibians out of the 23 that are found here.

-

Amphibians are different from other vertebrates in the following ways:

- 1) Eggs must be laid in water.
- 2) Only partially adapted to terrestrial life.
- 3) Gills always present in larvae and may be retained in adults or be replaced by lungs.
- 4) Four limbs.

There are about 45 endangered amphibians in the world. Factors causing them to be endangered include: collection, collection for food, habitat destruction and fear.

-

How amphibians are important:

- 1) They help us by eating worms (crop pests) and insects.
- 2) They are food for many birds, reptiles and mammals.

Toads - dry warty skin

Frogs - damp smooth skin

Salamanders - small weak limbs and tails that can regenerate. Usually nocturnal. Most are terrestrial as adults, some are aquatic and a few arboreal.

Newts - types of salamanders.

Amphibians are found all over the world in ponds, streams, woods and caves but not in sea water (they cannot tolerate salt).

REPTILES

-

Characteristics of Reptiles:

- 1) Variable body temperature (cold blooded).
- 2) Land dwelling (completely adapted to terrestrial life).
- 3) Scaly bodies (skin covered with scales) or tough and bony hide.
- 4) Eggs protected by a shell and can be laid on land.
- 5) Gills never develop.
- 6) Heart usually 4-chambered.

7) Fertilized internally.

Example of Reptiles are lizards, tortoises, snakes, crocodiles and turtles.

-

Facts about reptiles:

1) Size range from land turtles (tortoises), which weigh more than 500 lbs. to small lizards and worm-like snakes.

2) Some persons develop a fear of reptiles, especially snakes. This fear stems primarily from misunderstanding.

3) Reptiles, like most other animals, attack other living things mainly for food or out of fear. They try to hide or escape from trouble, but if the threat is sudden or close, they resort to other behaviour. Many hiss loudly or make other noises to frighten off an intruder.

4) If they become too warm in the sunlight, they move to shade or burrow under a rock. On cold days, they expose themselves to as much sunlight as they can get.

5) There are 39 reptiles in Jamaica, of which 26 are endemic.

6) Alligators are not found in Jamaica, only crocodiles are.

7) Two (2) extinct endemic Jamaican reptiles are the Giant Yellow Galliwasp and the Black Racer.

-

How reptiles are important:

1) Crocodiles eat sick and weak fishes, thus keeping fish stock healthy.

2) Alligators keep water from stagnating by digging holes in the waterbed.

3) Snakes eat rats and mice, which carry and spread diseases.

4) Lizards eat injurious insects, and are the food of other animals (eg. Chicken Hawks).

About 100 species of reptiles are presently in danger of becoming extinct.

-

Why some reptiles are endangered

- 1) Increasing scarcity of many species of reptiles marked by widespread slaughter of crocodiles and snakes, mainly for their skins.
- 2) Filching of eggs and hunting of adult marine turtles.
- 3) Export of tortoises, lizards and snakes destined to a miserable existence in collectors' tanks.
- 4) The continuous insensate killing of venomous snakes which results in the murder of thousands of absolutely harmless species (eg. The Yellow Snake).

TEACHER'S NOTES

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GRADES 7 to 9 - Amphibians and Reptiles

Amphibian means "having two lives".

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Characteristics of Amphibians:

- 1) They have no scales, feathers or fur on their bodies.
- 2) They spend much of their lives on land.
- 3) Feet, if present, are webbed.
- 4) Toes are soft and lacking claws.
- 5) Body covered by a thin, flexible and usually naked, moist, slimy skin.
- 6) Immature or Larval forms are herbivorous, adults are usually carnivorous.

7) Eggs are fertilized externally as soon as they are laid.

8) Hearts are 2-chambered in larvae, but 3-chambered in adults.

Examples of amphibians are frogs, salamanders, newts and toads.

-

Facts about amphibians:

1) Aquatic and fish-like when young but leave for land when they become adults (e.g. tadpoles change into frogs).

2) When the surroundings are warm, so are they, which makes them very active. When cold, the temperature is low, which reduces them to a state of inactivity (cold blooded).

3) In Jamaica there are 18 endemic amphibians out of the 23 that are found here.

-

Amphibians are different from other vertebrates in the following ways:

1) Eggs must be laid in water.

2) Only partially adapted to terrestrial life.

3) Gills always present in larvae and may be retained in adults or be replaced by lungs.

4) Four limbs.

There are approximately 45 endangered amphibians in the world.

The poisoning and devastation of wetlands are not the only threats to several of these animals, there is also direct human persecution for commercial reasons (collection, food and drink, breeding) or simply from fear.

-

How amphibians help us:

1) They help us by eating worms and insects that are crop pests.

2) They are food for many birds, reptiles and mammals.

Amphibians are found mainly at night or in rainy weather.

Amphibians are found all over the world in ponds, streams, woods and caves but not in sea water (amphibians cannot tolerate salt).

REPTILES

-

Characteristics of Reptiles:

- 1) Variable body temperature (cold blooded).
- 2) Land dwelling (completely adapted to terrestrial life).
- 3) Scaly bodies (skin covered with scales) or tough and bony hide.
- 4) Eggs protected by a shell and can be laid on land.
- 5) Gills never develop.

The four main groups of reptiles are: lizards, turtles, snakes and crocodiles.

-

Facts about reptiles:

- 1) Size range from land turtles (tortoises), which weigh more than 500 lbs. to small lizards and worm-like snakes.
- 2) Some persons develop a fear of reptiles, especially snakes. This fear stems primarily from misunderstanding.
- 3) Reptiles, like most other animals, attack other living things mainly for food or out of fear. They try to hide or escape from trouble, but if the threat is sudden or close, they resort to other behaviour. Many hiss loudly or make other noises to frighten off an intruder.

4) If they become too warm in the sunlight, they move to shade or burrow under a rock. On cold days, they expose themselves to as much sunlight as they can get.

5) There are 39 reptiles in Jamaica, of which 26 are endemic.

6) Alligators are not found in Jamaica, only crocodiles are.

7) Two (2) extinct endemic Jamaican reptiles are the Giant Yellow Galliwasp and the Black Racer.

-

How reptiles are important:-

1) Crocodiles eat sick and weak fishes, thus keeping fish stock healthy.

2) Alligators keep water from stagnating by digging holes in the waterbed.

3) Snakes eat rats and mice, which carry and spread diseases.

4) Lizards eat injurious insects, and are the food of other animals (eg. Chicken Hawks).

About 100 species of reptiles are presently in danger of becoming extinct.

-

Why some reptiles are endangered

1) Increasing scarcity of many species of reptiles is marked by widespread slaughter of crocodiles and snakes, mainly for their skins.

2) Filching of eggs and hunting of adult marine turtles.

3) Export of tortoises, lizards and snakes destined to a miserable existence in collectors' tanks.

4) The continuous insensate killing of venomous snakes which results in the murder of thousands of absolutely harmless species (eg. The Jamaican Boa).

TEACHER'S NOTES

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GRADE 4 - Birds

A bird is a warm-blooded animal that usually has its body covered with feathers. It has two wings and two feet. It also lays eggs.

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Birds that help us:

1. Birds that eat rodents (rats and mice): Chicken Hawk, Jamaican Owl and Barn Owl.
2. Birds that spread seeds: Yellow-billed Parrot and Parakeet.
3. Birds that eat insects: Woodpecker, Loggerhead and Gaulin.
4. Birds that eat dead animals: John Crow.

TEACHER'S NOTES

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GRADE 5 and 6 - Birds

A bird is a warm-blooded animal that usually has its body covered with feathers. It has two wings and two feet. It also lays eggs.

-

Birds that help us: Notes

1. Birds that eat rodents (rats and mice): Chicken Hawk, Jamaican Owl and Barn Owl.
2. Birds that spread seeds: Yellow-billed Parrot, Parakeet and Cling Cling (Grackle)
3. Birds that eat insects: Woodpecker, Loggerhead, Petchary and Gaulin.
4. Birds that eat dead animals: John Crow.
5. Birds that eat sick and weak fishes: Pelican, Sea Gulls and Fish Hawk.

6. Birds that pollinate flowers: Hummingbird and Beeny Bird.

TEACHER'S NOTES

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GRADE 7 to 9 - Birds

A bird is a warm-blooded animal that usually has its body covered with feathers. It has two wings and two feet. It also lays eggs.

-

Birds that help us: Notes

1. Birds that eat rodents (rats and mice): Chicken Hawk, Jamaican Owl, Lizard Hawk and Barn Owl.
2. Birds that spread seeds: Yellow-billed Parrot, Black-billed Parrot and Cling Cling (Grackle)
3. Birds that eat insects: Woodpecker, Loggerhead, Petchary, Gaulin, Mockingbird and Ani.
4. Birds that eat dead animals: John Crow.
5. Birds that eat sick and weak fishes: Pelican, Sea Gull and Fish Hawk.
6. Birds that pollinate flowers: Hummingbird and Beeny Bird.

TEACHER'S NOTES

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GRADE 4 - Plants

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Characteristics of Plants:

- 1) Plants usually have roots, stems and green leaves.
- 2) Plants do not stop growing.
- 3) All animals depend on plants for food as plants are the only living creatures that can create their own food, from the earth's ultimate source of energy - the sun.

-

How plants help us

- 1) Plants give us oxygen and they take away carbon dioxide.
- 2) Plants attract rain.
- 3) We sell plants to make money.
- 4) Many animals make their homes in plants.
- 5) Many types of medicines are derived from plants.

TEACHER'S NOTES

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GRADES 5 AND 6 - Plants

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Characteristics of Plants:

- 1) Plants usually have roots, stems and green leaves.
- 2) Plants do not stop growing.
- 3) All animals depend on plants for food as plants are the only living creatures that can create their own food.

All animals depend on plants for food either directly, eg. herbivores; or indirectly, eg. carnivores. Plants are the only living thing that can make use of the sun's energy.

-

How plants help us

- 1) Trees provide us with oxygen and they take away carbon dioxide.
- 2) Trees attract rain.
- 3) We sell fruits, vegetables and root crops to make money.
- 4) Many animals live in plants.
- 5) Many types of medicines are derived from plants.
- 6) Trees shade crops and prevent soil erosion.

Things that are made from plants include: furniture, paper, juice boxes, houses, coal, boats, carts and fences.

TEACHER'S NOTES

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GRADES 7 to 9 - Plants

All living things are either plants or animals.

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Characteristics of Plants:

- 1) Plants usually have roots, stems and green leaves.
- 2) Plants do not stop growing.
- 3) Plants are the only living creatures that can make their own food.

All animals depend on plants for food either directly, eg. herbivores; or indirectly, eg. carnivores.

-

How plants help us

- 1) Trees provide us with oxygen so that we can breathe, and they take away dangerous carbon dioxide.
- 2) Plants attract rain, by acting as a natural sponge.
- 3) We sell fruits, vegetables and root crops to make money.
- 4) Plants are the home of various other living things.
- 5) Almost all medicine comes from plants.
- 6) Trees prevent soil erosion and provide shade for crops.

-

Things that are made from plants include:

Furniture, paper, dyes, cotton, medicine, food, gum, rum, paint, fences, magazines, juice boxes, houses, coal, boats, carts and fences.

TEACHER'S NOTE

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GRADE 4 - How We can help preserve the environment

- 1) Not littering.
- 2) Not killing wildlife.
- 3) By planting trees.
- 4) Putting up bird feeders to attract birds.
- 5) Reusing things in our homes.
- 6) Repairing instead of throwing out things and buying new ones.
- 7) By composting.

- 8) Writing on both sides of paper.
- 9) Helping to save endangered animals by not buying or using objects made from fur, ivory, reptile skin, or tortoise shells.
- 10) Turning off lights, televisions and radios when leaving rooms.

TEACHER'S NOTE

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GRADES 5 AND 6 - How We can help preserve the environment

- 1) Not littering.
- 2) Not killing wildlife.
- 3) By planting trees.
- 4) Putting up bird feeders to attract birds.
- 5) Reusing things in my home.
- 6) Repairing instead of throwing out things and buying new ones.
- 7) By composting.
- 8) Writing on both sides of paper.
- 9) Helping to save endangered animals by not buying or using objects made from fur, ivory, reptile skin, or tortoise shells.
- 10) Turning off lights, televisions and radios when no one is in a room.
- 11) By starting re-cycling project in our communities.
- 12) Use a reusable cloth shopping bag.
- 13) Give a friend a plant.

TEACHER'S NOTES

GRADES 7 TO 9 - How We can help preserve the environment

- 1) Not littering.
- 2) Not killing wildlife.
- 3) By planting trees.
- 4) Putting up bird feeders to attract birds.
- 5) Reusing things in my home.
- 6) Repairing instead of throwing out things and buying new ones.
- 7) By composting.
- 8) Writing on both sides of sheets of paper.
- 9) Helping to save endangered animals by not buying or using objects made from fur, ivory, reptile skin, or tortoise shells.
- 10) Turning off lights, televisions and radios when you leave rooms.
- 11) By learning more about nature and sharing our knowledge with our friends.
- 12) By not keeping endangered animals as pets.
- 13) Learning to recycle and start projects in your community.
- 14) Turn off the water faucet while brushing your teeth.
- 15) Help clean up public places that have long been forgotten.

TEST 1

GRADE 4

NAME:

Circle the letter with the correct (best possible) answer.

1. An animal that eats only fruits is

(a) a carnivore (b) a prey

(c) a herbivore (d) an omnivore

2. Which of the following Jamaican animals is extinct?

(a) Jamaican Rice Rat (b) Yellow Snake

(c) Yellow-billed Parrot (d) Jamaican Iguana

3. Omnivores eat

(a) plants only (b) plants and animals

(c) meat only (d) fish only

4. One reason people protect the environment is because of the importance of

(a) being endangered (b) ecosystems

(c) being extinct (d) being endemic

TRUE or FALSE

1. Nocturnal means active at night. _____

2. Love and Money are two reasons for preserving the environment.

3. The Indian Coney is endemic to India. _____
4. The Jamaican Parakeet is an endangered Jamaican bird. _____

Fill in the blank spaces with the words provided.

nocturnal, predators, extinct, range,

1. The _____ of the Jamaican Iguana is in Hellshire in St. Catherine.
2. Yellow Snakes are active at night but the Jamaican Iguana is not _____.
3. Cats, dogs, wild pigs and mongooses are the _____ of the Jamaican Iguana.
4. Because all living things depend on each other to live, we should make sure that the Jamaican Iguana does not become _____.

Answer these questions.

1. What are prey?

2. What are the four main reasons for protecting the environment?

3. Name three endangered Jamaican animals.

4. Give one reason why each animal that you named in number three is endangered.

Annex II

TEST 1

GRADES 5 and 6

NAME:

Circle the letter with the correct (best possible) answer.

1. An animal that no longer exists is said to be

(a) endemic (b) extinct

(c) endangered (d) ecosystems

2. The Jamaican Swallowtail Butterfly is

(a) endangered (b) pollution

(c) extinct (d) habitat

3. Two reasons for protecting the environment are

(a) compassion and herbivores (b) omnivores and money

(c) ecosystems and beauty (d) range and carnivores

4. One Jamaican animal that is extinct is the

- (a) Black-billed Parrot (b) Giant Yellow Galliwasp
(c) Jamaican Swallowtail Butterfly (d) Jamaican Boa
5. The Indian Coney is a Jamaican animal that is
(a) a carnivore (b) an omnivore
(c) a herbivore (d) a habitat

TRUE or FALSE

1. A carnivore eats only plants. _____
2. The Jamaican Iguana is killed and eaten by wild pigs. _____
3. The Jamaican Boa is the same thing as the Yellow Snake. _____
4. People can make money from the environment. _____
5. Garbage in gullies is an example of pollution. _____

Fill in the blank spaces with the words provided.

environment, habitat, range, compassion, carnivore

1. The _____ of the Jamaican Swallowtail Butterfly is Millbank in Portland and the Cockpit Country in Trelawny.
2. Forests with Water Mahoe trees are the _____ of the Jamaican Swallowtail Butterfly.
3. The Jamaican Boa is a _____, it eats rats, mice and lizards.
4. We need to protect the _____ if we are to live safe and healthy lives.

5. Many people feel _____ for the Jamaican Boa because some people are fearful of them and kill them.

Answer these questions.

1. What are the four main reasons for protecting the environment?

2. Name four Jamaican animals that are endangered .

3. Give one reason why each animal that you named in question number two is endangered.

4. What is the meaning of "endemic"? Give an example of an endemic animal.

5. Name one Jamaican animal that is extinct.

Annex III

TEST 1

-

GRADES 7 to 9

NAME:

Circle the letter with the correct answer.

1. Removal of forests, trees and other types of plants is known as

- (a) habitat (b) pollution
(c) environment (d) deforestation

2. The Black-billed Parrot is an animal that is

- (a) endangered (b) pollution
(c) extinct (d) habitat

3. A Jamaican Bird that is now extinct is the

- (a) Black-billed Parrot (b) Jamaican Parakeet
(c) Jamaica Rice Rat (d) Ring-tailed Pigeon

4. The seas, ponds and forests are examples of

- (a) habitat (b) range
(c) food chains (d) pollution

5. Leaves ---> insects ---> lizards ---> kestrel

This is an example of,

- (a) a food web (b) a food chain
(c) an environment (d) a species

6. If we destroy plants and other animals we will eventually destroy ourselves. This fact stems from our

- (a) knowledge of ecosystems (b) feelings of love for them

(c) enjoyment of their beauty (d) ability to make money from them

TRUE or FALSE

1. The Indian Coney is endemic to Jamaica. _____
2. The Jamaican Iguana is extinct. _____
3. Some medicine comes from plants. _____
4. All food chains begin with plants. _____
5. All living things depend on each other. _____
6. People preserve plants and animals for their beauty. _____

Fill in the blank spaces with the words provided.

pollution, species, compassion, endemic,

Jamaican Iguana, Jamaican Boa

1. The Black-billed Parrot and the Yellow-billed Parrot are two different _____ of birds.
2. _____ of the Kingston Harbour is so bad, that scientists believe that nothing will be able to live in the water in the next 20 years.
3. The Giant Swallowtail Butterfly is an _____ Jamaican insect.
4. _____ is the love of plants and animals because they have a right to live.
5. The _____ is an endangered Jamaican animal killed out of fear.
6. Mongooses and wild pigs kill the endangered _____.

Short answer questions.

1. Write a food chain and state what the arrows mean.

2. Name four endangered Jamaican animals.

3. Give at least two reasons why each animal named in question two is endangered.

4. State the four main reasons for protecting the environment.

5. What is the meaning of the word "environment"?

6. Name two Jamaican animals that are extinct.

Annex IV

Local Name Common Name Scientific Name

Yellow Snake Jamaican Boa *Epicrates subflavus*

Black Racer

Giant Yellow -

Galliwasp

Crocodile American Crocodile

Yacca *Podocarpus urbanii*

Ackee *Blighia sapida*

Wild Pine Bromeliads *Tillandsia* ssp.

Hohenbergia ssp.

Guzmania ssp.

Water Mahoe

Jamaican Rice Rat

Indian Coney Jamaican Hutia *Geocapromys brownii*

Jamaican Iguana *Cyclura collei*

Sea cow;

West Indian Manatee *Trichechus manatus* Caribbean Manatte

Mongoose Small Indian Mongoose *Herpestes auropunctatus*

Giant Swallowtail -

Butterfly *Papilio homerus*

Fiddler Beetle

Bromeliad Crab *Metopaulias depressus*

Chicken Hawk Red-tailed Hawk *Buteo jamaicensis*

Brown Owl; Potoo Jamaican Owl *Pseudoscops grammicus*

Screech Owl;

Patoo; Common Barn Owl *Tyto alba*

Parakeet Olive-throated

Parakeet *Aratinga nana*

Woodpecker Jamaican Woodpecker *Melanerpes radiolatus*

Loggerhead Loggerhead Kingbird *Tryannus caudifasciatus*

Local Name Common Name Scientific Name

Gauling;

Tick Bird Cattle Egret *Bubulcus ibis*

John Crow Turkey Vulture *Cathartes aura*

Cling-Cling Greater Antillean

Grackle *Quiscalus niger*

Old Joe Brown Pelican *Pelican occidentalis*

Sea Gulls *Laridae* spp.

Fish Hawk;

Fish Eagle Osprey *Pandion haliaetus*

Been Bird Bananaquit *Coreba flaveola*

Tick Bird;

Savana Blackbird;

Ani Smooth-billed Ani *Crotophaga ani*

Nightingale Northern Mockingbird *Mimus polyglottos*

Petchary Gray Kingbird *Tyrannus dominicensis*

Lizard Hawk; American Kestrel *Falco sparveicus*

Sparrow Hawk Jamaican Pauraque *Siphonorhis americana*

Parrot Yellow-billed Parrot *Amazona collaria*

Parrot Black-billed Parrot *Amozona agilis*

Ringtail Ring-tailed Pigeon *Columba caribae*

Black-capped Petrel *Pterodroma hasitata caribea*

Doctor Bird Red-billed

Streamertail *Trochilus polytmus polytmus*

Doctor Bird Black-billed

Streamertail *Trochilus polytmus scitulus*

Doctor Bird Jamaican Mango *Anthracothorax mango*

Wildpine Sergant Jamaican Blackbird *Nesopsar niggerimus*



