1995

Teacher resource guides for the San Bernardino County Museum

Cindy Louise Fullwiler

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TEACHER RESOURCE GUIDES
FOR THE SAN BERNARDINO COUNTY MUSEUM

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Masters of Arts
in
Education: Environmental

by
Cindy Louise Fullwiler
September 1995
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Approved by:

Dr. Darleen Stoner, First Reader 8/31/95
Dr. Iris Riggs, Second Reader
Abstract

The Teacher Resource Guides for the San Bernardino County Museum were designed to help teachers prepare or extend units presented by a museum outreach representative to students in classroom settings. The guides supplement four presentations: birds, insects, rain forest, and whales and sharks. Each guide consists of recommended videos, children's literature, and cross-curricular activities.
Acknowledgements

Many thanks to Dr. Darleen Stoner for her support and motivation during this process. Much appreciation to Dr. Iris Riggs for taking the time to be a second reader on my project. Special thanks to Nancy Manning for the opportunity to work with her, without which, this project would not have been conceived. I am especially grateful to my special friends, Helen and Al Hull, for their love and support, which kept me grounded and gave me the courage to continue when times were tough. Finally, a proud thank you to my students who donated their art work for this project.
Dedication

To my daughter and the women in my family: follow your dreams and have the courage to preserve in spite of the odds.
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INTRODUCTION

The health of our environment has been a major concern for the past 25 years. Yet nationally, environmental education is not typically part of our school curriculum. Some of the reasons given for the lack of environmental education are: lack of funds, an already overcrowded curriculum, lack of teacher preparation time, inadequate resources and materials (Stone, 1989). One strategy some schools use to address the problems is through museum outreach programs (Shepard, 1989).

Museum outreach programs assist teachers in meeting environmental education needs by taking the museum programs to the schools. The problem of a lack of preparation time is address with the outreach programs going directly to the schools. To help teachers reduce their preparation time and deal with the lack of materials, some outreach programs have materials that teachers can use to reinforce or extend the outreach lessons.

The Teacher Resource Guides for the San Bernardino County Museum were designed to help teachers prepare students for or to extend environmental lessons presented by an outreach specialists. Teachers will find that the activities in the guides are simple and easy to implement. The literature guides will save teachers time because they won't have to spend hours looking for books to support
their program. Components of environmental education can be taught within the existing school program (Stone, 1990). Activities in science, mathematics, art, language arts, and social studies are presented in this project to help bridge the gap in environmental education.

The guides supplement four museum outreach presentations: birds, insects, rain forest, and whales and sharks. Each unit consist of three parts. First, a list of videos that are available for check-out at the museum is provided. Second, a recommended list of children's literature is included to help teachers prepare for the outreach presentations or extend the lessons. Finally, cross-curricular activities are suggested which allow development of the units beyond the science content area.

This project is the culmination of one-year's work, including fieldwork at the San Bernardino County Museum. While completing the fieldwork, the outreach specialist expressed a need to provide teachers with literature and activities that correlate with the outreach programs. The outreach programs were presented to 70,000 children last year. Teachers had often requested additional materials to extend their students' experience. But, with only one presenter, there was little time to develop curriculum. Once a need for the units was established, development of the units became the focus of this project.
Goal and Objective

Goal

It is the goal of this project to reinforce and extend environmental concepts presented by a museum representative, which will ultimately result in informed decision making and responsible behavior toward our environment by students.

Objective

To develop four units on birds, insects, rain forests, and whales and sharks. Each unit will include a list of videos that are available for check-out at the museum, a recommended list of children's literature to help teachers prepare for the outreach presentations or extend the lessons, and cross-curricular activities which allow development of units beyond the science content area.
Literature Review

The literature review includes a definition and goals of environmental education. It also establishes a need for environmental education in our schools. Since children's literature and cross curricular activities are the focus of this project, two sections of the review support using children's literature and an interdisciplinary approach to teaching environmental education.

Definition and Goals of Environmental Education

The term "environmental education" is not a new term. It has been around since the 1960s (Ramsey, Hungerford & Volk, 1992). O'Brian and Stoner (1987) described environmental education as, "the development of citizens who are knowledgeable about the world around them and involved in working toward a more livable place." Teaching people to become more aware of global problems and giving them the opportunity to make educated responsible decisions is the thrust of an environmental program as suggested in Project WILD's (1983, p. vii) curriculum goal:

The goal...is to assist learners of any age in developing awareness, knowledge, skills, and commitment to result in informed decisions, responsible behavior, and constructive actions concerning wildlife and the environment upon which all life depends.
Need for Environmental Education

With an already over-crowded curriculum, teachers may ask, "Why teach environmental education?" Ramsey et. al. (1992) described our world as changing rapidly technologically, politically, culturally, and aesthetically and that environmental education is needed to prepare individuals to be responsive to these changes.

According to Stoner and Overbey (1989), students enjoy active participation in environmental science. They develop a positive self-image by making their own lifestyle decisions. Fostering positive self-esteem, responsible character, and cooperative learning are additional benefits to environmental education.

Some nonformal educational programs such as museums, Scouts, Future Farmers of America, and 4-H have been actively involved in environmental education for many years. The success and growth of these groups suggests that society values environmental education (Shepard, 1989).

Another compelling reason for teaching environmental education is to help students make a connection with nature. Children have a difficult time connecting with nature because they often live in environments devoid of nature. Estes (1993) found that students who had not been exposed to nature were afraid of little things such as insects. According to Estes, our biggest challenge is to reconnect.
children to their natural environment.

Using Children's Literature to Teach Environmental Education

One of the ways children can connect with the environment is through children's literature. O'Brien and Stoner (1987) recommended the use of children's literature as a way of providing vicarious experiences. In addition to being fun, literature can help explain important concepts and stimulate interest in the environment. With the exploration of environmental concepts from their readings, children are able to make sense of their world (O'Brien & Stoner, 1987).

Another advantage of using children's literature is that it can be integrated with other content areas (Webre, 1995). After reading a story about whales, teachers may conduct related lessons in mathematics, mapping, poetry writing, music, and art to continue the learning experience.

Using an Interdisciplinary Approach

Teachers who would like to teach environmental education may wonder how they are going to fit yet another subject into their tight schedule. One of the ways to ease that dilemma is to integrate science concepts into other content areas. Rather than teach a new course, it may be more feasible to integrate environmental components into existing curricular areas (Stone, 1990).

English-Language Arts is an integral part of the
Regardless of the subject taught, effective teachers are aware that language arts is used in all areas of the curriculum (English Language Arts Model Curriculum Guide, 1988). Reading and writing need not be restricted to English textbooks. Language arts skills can be applied to social studies, science, and environmental content areas. According to the It's Elementary-Elementary Grades Task Force Report (1992), good elementary programs help students develop thinking skills across the curriculum.

To create an environment in which students are excited about learning, teachers need to recognize that subjects such as language arts is not a subject in itself so much as a tool of discovery that students can use to enter new worlds. Skills in language arts are acquired and perfected by practicing it across the curriculum... (It's Elementary, 1992, p. 6).

The History-Social Science Framework for California Public Schools Kindergarten through Grade Twelve (1988) also supported teaching across the curriculum. "Teachers are expected to integrate content from other fields, such as language arts, science, and the visual and performing arts, in order to achieve correlation across subjects" (History Social Science Framework, 1988, p.4.).

Mathematics is important because it helps students develop thinking skills, order their thoughts, develop logical arguments, and make valid inferences (Mathematics Framework for California Public Schools Kindergarten Through
In order that students become responsible citizens who make informed decisions about their world, they need to possess many of these skills. Teaching math skills and concepts can involve more than textbook, pencil, and paper computational activities. "In addition to its intrinsic value, a knowledge of mathematics is essential to many other diciplines" (Mathematics Framework for California Public Schools Kindergarten Through Grade Twelve, 1985, p. 1).

The California State Science Framework for California Public Schools Kindergarten Through Grade Twelve (1990) encouraged an integrated approach to teaching science because, although progress has been made in science instruction by making it more engaging for students, "the general trend has been to reduce and compartmentalize science content and focus on isolated facts and concepts" (California State Science Framework, 1990, p.7). To counteract this problem the California State Science Framework for California Public Schools Kindergarten Through Grade Twelve (1990) emphasized a thematic approach to teaching science to enable students to make connections among the various disciplines and to understand the rapidly changing world.
Program Design

The teacher resource guides were designed to correlate with four Outreach programs from the San Bernardino County Museum. Units available at the museum are: birds, insects, rain forest, sharks and whales. Previously, there had been little or no supplemental materials that teachers could use to extend and reinforce museum presentations.

Each unit begins with a list of videos that teachers may check out from the museum before or after a presentation given by a museum representative. Video titles include a summary and a grade level recommendation. Titles of children's literature with summaries and grade level recommendations are the second part of the unit. Teachers may use the literature to help prepare students in concepts to be taught, in conjunction with the lessons, or as a follow up activity. The children's literature provides information that is needed for some of the activities in the units.

Cross-curricular activities complete the unit and include content areas in science, math, language arts, social studies, and art. Activities in this section do not have grade level recommendations because they may be adjusted to either primary (K-3) or intermediate (4-6) levels. Student ability should be considered when selecting the activities.
Cross-curricular activities in this project were designed to be a springboard of ideas. Teachers may expand on these ideas and implement them in their own creative way. In the introduction to each unit, teachers are encouraged to collect the literature titles first. Some of the titles in this project are available at the public library. Individual school libraries may have some of the titles. Teachers may want to ask their school principal to purchase the literature for their school library.

Once the books are collected, they can be put in a special area of the classroom so that students have access to them. When an activity requires specific information, students will be able to find the facts that they need in their own classroom.

Most of the activities in these units were used successfully by students in my class. However, actual field testing of these units by teachers was beyond the scope of this project.

The distribution of the units has been discussed. Distribution will not occur immediately because funding for copies needs to be addressed.
Implications for Education

Units developed for the San Bernardino County museum help teachers extend and reinforce museum presentations. Children need to be taught these environmental education concepts so that they may keep up with our ever changing world. Environmental education helps students understand the relationship between themselves and their environment. Environmental education also fosters a positive self-esteem through decision making.

Using children's literature is a way of extending environmental science lessons. Children make connections with nature through reading literature. Literature provides children with vicarious experiences and explains important concepts which stimulates interest in the environment.

With cross-curricular activities children are able to develop thinking skills across the curriculum while allowing them to explore their values, feelings, meaning, and their relationship of self to others.

Rather than compartmentalize content areas, these units assist teachers in recognizing that each subject is not just a subject in itself, but, also a tool to explore and discover connections in our world.
APPENDIX

A

BIRDS
Birds

A Resource Guide to be used in conjunction with Educational Outreach Programs on Birds presented by the San Bernardino County Museum

by

Cindy Fullwiler
Dear Educator:

The Teacher Resource Guides for the San Bernardino County Museum were designed to help you prepare or extend units presented by a museum outreach representative to students in classroom settings.

Each unit consists of three parts. First, a list of videos that are available for check-out at the museum is provided. Second, a recommended list of children's literature is included. Finally, cross-curricular activities are suggested which allow development of units beyond the science content.

One effective way to begin teaching these units is to collect the literature titles first. You should check your local libraries for the titles. Your may also want to ask your principal to purchase the literature. Once the books are collected, they can be put in a special area of the classroom library so that students have access to them.

You are encouraged to try the units and use them in your own creative way.
BIRD VIDEOS

Grade Key
Primary (K-3)
Intermediate (4-6)

Baby Birds
Sierra Club Childrens' Series
30 minutes
Primary, Intermediate
Different types of baby birds look very different at birth. The differences are beautifully photographed.

Hummingbirds Up Close
National Audubon Society
55 minutes
Intermediate
In a comprehensive look at hummingbirds, you'll see 15 species found north of the Rio Grande river, male hummingbirds in courtship flight, females tending the nest, and slow motion sequences of hummingbirds catching insect. Information for attracting these jewels of the sky to your backyard is provided.

Eagles
Escape tapes
40 minutes
Primary, Intermediate
A pair of bald eagles return to the traditional nest site, renew their bond, protect the egg and chick, and coax the chick into its first flight.

Owls Up Close
National Audubon Society
55 minutes
Primary, Intermediate
Owls and their behavior are filmed in their natural habitat.
Grade Key
Primary (K-3)  Intermediate (4-6)

AVI. The Bird, the Frog, and the Light
Orchard Books, 1994
Primary
Picture Fable
A frog learns the truth about his self-importance when he meets a bird whose song brings the sun's rays to the Earth.

Baker, Jannie. Home in the Sky
Scholastic, 1984
Primary
Picture
A pigeon flies away from its owner to explore. After becoming trapped in a train, a young boy takes care of it.

Baylor, Byrd. Hawk, I'm Your Brother
Aladdin Books, 1986
Primary
Historical Fiction
A boy who wants to fly catches a hawk hoping that their kinship will bring him closer to his goal of flying.

Carlstrom, Nancy White. Goodbye Geese
Scholastic, 1992
Primary
Picture
When geese fly honking south it's a sign that winter is coming.

Little Red Hen, The. No Author
Houghton Mifflin, 1989
Primary
Picture
The Little Red Hen finds some wheat and asks her friends to help her plant, cut and grind the wheat to make bread. The friends only want to help with eating the bread. Sharing, helping and food supplies are key issues in this story.
George, Jean Craighead. The Moon of the Winter Bird
Harper Collins, 1992
Intermediate
Contemporary Realistic Fiction
During a cold spell in December, a song sparrow that has not migrated south must adjust to the changes that winter brings.

Guiberson, Brenda Z. Spoonbill Swamp
Henry Holt & Co. 1992
Primary
Picture
The day-to-day activities of the spoonbills and alligators in a swamp are depicted.

Hutchins, Pat. Rose's Walk
Macmillan Publishing Co., 1968
Primary
Picture
Rose's walk takes her all over the farm as a fox watches closely. Natural habitats and the food chain are issues to discuss after reading the story.

Johnston, Tony. The Old Lady and the Birds
Harcourt Brace & Co. 1994
Primary
Picture Fiction
In her garden in Mexico, an old lady enjoys watching the birds in their natural habitat, warning the cat to leave them alone.

McCloskey, Robert. Make Way For Ducklings
Viking Press, 1941
Primary
Picture
A police officer helps a family of ducks cross the streets to reach the pond. Natural habitat and its components are depicted.

Oppenheim, Joanne. Have You Seen Birds?
Scholastic, 1986
Primary
Picture
A cat is sitting inside the house looking out the window. The cat sees different types of birds. Students are introduced to many species of birds and their physical characteristics.
Politi, Leo. *Song of the Swallow*
Macmillan Publishing Co., 1948
Primary, Intermediate
Nonfiction-Informational
A little boy watches the swallows fly to San Juan Capistrano every year. He plants a garden to attract the swallows to his house.

Tafuri, Nancy. *Have You Seen My Duckling?*
Greenwillow Books, 1984
Primary
Picture
A mother duck leads her ducklings around the pond as she searches for one missing duckling.

Tejima, Keizaburo. *Owl Lake*
Philomel Books, 1982
Primary
Picture Fiction
As the sun slipped down behind the lake and the sky darkened, father owl came out to hunt for fish to feed his family.
CROSS-CURRICULAR ACTIVITIES

BIRDS

Science

Bird Attributes

List and discuss the attributes of birds. Take students outside to observe birds. Have them draw a picture of their observations.

Birds have feathers.
Birds have beaks.
They have two wings. Most can fly.
Birds have keen hearing and eye sight.
Birds are vertebrates (they have backbones).

Beaks

Compare bird beaks and discuss how each type is related to food eaten.

Some birds have long hollow beaks that are used to probe flowers for nectar.

Birds, such as kiwis and snipes, use their long beaks to probe for worms and crustaceans in the water and mud.

Sparrows use their short conical shaped beak to break open seeds.

Pelicans have a long beak, shaped like a pouch to scoop up fish.

A flamingo's long, conical-shaped beak is used to filter plants and animals from the water.

Whip-poor-wills have a fairly small beak, but a very large mouth with which to catch.

Small birds, such as warblers, have a sharp pointed beak for picking insects off of plants.

Toucans have a long strong beak which is useful in picking fruit off the trees.

A Ranger Rick's Copycat Page is included so that students may see the differences in bird beaks. For additional activities on bird beaks see Ranger Rick's NatureScope.

Feet

Compare feet of different birds and discuss how each type relates to its habitat and feeding. Using the pictures at the end of this unit, have students make a model of the feet of one of the birds with clay.

Birds use their feet for climbing, running, perching, swimming, scratching, and grabbing.

Perchers have three toes that face forward and one long hind toe.

Graspers have long curved claws, called talons, which are used to grab their prey and help them hold onto it while flying.

Climbers have two toes in front and two toes in back so that they can climb up and down trees.

Runners have two and three toes all facing forward for fast running.

Scratchers have rake-like toes for scratching in the soil for their food.

Swimmers have webbed feet which are like paddles to help them swim.

Some good magazines for pictures of birds are: Birder's World, ZooBook, Ranger Rick, and Your Big Backyard.

Math

Compare the wing span of a hummingbird to that of a California condor. The wing span is measured from the tip of one wing to the other including the body width. A hummingbird's wing span is about 5 inches while the condor's is about 10 feet. With a ruler and some chalk, draw the two wing spans on the chalkboard or outside on the cement.

Have students try to flap their arms to the wing beat of a hummingbird. Have students watch a clock that shows
seconds. Tell them that they need to stretch their arms out by their side. When the teacher says go, students will flap their arms 700 times in 10 seconds. Ask students to figure out how many times a hummingbird would flap its wings in one minute.

Language Arts

Read the story, The Little Red Hen. Discuss the story, the characters, how they behaved, and the setting. Have students work in small groups to practice and act out the story. After each group has presented their version of the story, have each child draw a picture of the story and write about it. Share the art and stories if time allows. This activity can be stretched over several days.

Take students outside to observe birds such as English Sparrows. Develop a word bank based on their observations. Using the word bank, students may write a bird poem.

Cinquains are easiest for primary grades. A cinquain is made up of the following lines:

Line 1-One word which names the subject.
Line 2-Two words which define or describe the subject.
Line 3-Three words which express action associated with the subject.
Line 4-A four word phrase about the subject.
Line 5-One word which sums up, restates, or provides a synonym for the subject.

If students are learning this form for the first time, it might be helpful to do a few poems as a whole group.

Social Studies

Discuss how human habitat and actions affect birds. To begin, discuss competing demands for land. List the ways in which the land in your community is used: parks, houses, roads, shopping centers, and office buildings. Discuss the natural habitats in your community such as a forest, streams, oceans, deserts, and lakes. Discuss how birds might be affected when part or all of their habitat is developed for human use. Have students look for similar issues in newspapers and magazines.

For more information and advance discussion ideas refer to Ranger Rick's NatureScope Birds, Birds, Birds.
Art

Do a first-hand observation of local birds or of a pet bird. Students may do a drawing based on the observation.
<table>
<thead>
<tr>
<th>COPYCAT PAGE</th>
<th>FILL THE BILL</th>
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</thead>
<tbody>
<tr>
<td>1 NECTAR</td>
<td>4 FISH AND OTHER WATER ANIMALS</td>
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<tr>
<td>2 WORMS IN THE MUD</td>
<td>5 TINY WATER PLANTS AND WATER ANIMALS</td>
</tr>
<tr>
<td>3 SEEDS</td>
<td>6 FLYING INSECTS</td>
</tr>
<tr>
<td>8 FRUIT</td>
<td>7 CATERPILLARS AND OTHER INSECTS</td>
</tr>
</tbody>
</table>

- Whip Pooch Will
- Snipe
- Toucan
- Warbler
- Pelican
- Hummingbird
- Grosbeak
- Flamingo
<table>
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<tr>
<th>Copycat Page</th>
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<tr>
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<td>Tiny Water Plants and Water Animals</td>
</tr>
<tr>
<td>Seeds</td>
<td>Flying Insects</td>
</tr>
<tr>
<td>FRUIT</td>
<td>Caterpillars and other insects</td>
</tr>
</tbody>
</table>

Answer key:

- Pelican: 4
- Hummingbird: 1
- Grosbeak: 3
- Warbler: 7
- Toucan: 8
- Whip-poor-will: 6
- Snipe: 2
- Flamingo: 5
BIRD FEET are adapted for food-getting, defense weapons and locomotion, and sometimes for building nests. Birds usually have three or four toes on each foot. They NEVER have five.

Wading birds (herons, etc.) have long legs and long, slender toes.

Feet of perching birds (robin, sparrows, warblers, etc.) have tendons that automatically lock the bird to its perch while sleeping.

Swimming birds (ducks, geese, swans, etc.) have large webbed feet.

Climbers (woodpeckers, etc.) have spreading toes with strong, curved claws.

Birds of prey (hawks, owls, eagles, etc.) have powerful legs and strong feet with sharp, hooked talons for grasping and carrying their prey.

Ground-feeders (quail, chickens, etc.) scratch for food with their three forward-pointing toes. The small hind toe is raised above the level of the front toes.
APPENDIX

B

INSECTS
Insects

A Resource Guide to be used in conjunction with Educational Outreach Programs on Insects presented by the San Bernardino County Museum

by

Cindy Fullwiler
Introductory Note

Dear Educator:

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You are encouraged to try the units and use them in your own creative way.
INSECT VIDEOS

Grade Key
Primary (K-3)
Intermediate (4-6)

Bugs Don't Bug Us
Bo Peep Productions
35 minutes
Primary
Meet many of the most common insects which share our world and see children interact comfortably with them. See close up how insects move and eat. Watch a caterpillar turn into a butterfly.

The Benefits of Insects
National Geographic Society
15 minutes
Primary, Intermediate
Meet Bobby, an insect enthusiast, learns how insects help our soil, how insects are important in the food chain and discover the process of pollination.
INSECT LITERATURE

Grade Key
Primary (K-3)
Intermediate (4-6)

Aardema, Verna. Why Mosquitoes Buzz in People's Ears
Scholastic, 1975
Primary, Intermediate
Folktale
This African tale tells of a mosquito who causes a chain reaction of events. Students enjoy reading along with the repetitive parts of the story.

Carle; Eric. The Very Hungry Caterpillar
Philomel Book, 1981
Primary
Picture book
Students watch a hungry young caterpillar eat its way through the book until it's time to make a cocoon

Carlstrom, Nancy. Wild, Wild, Sunflower Child Anna
Macmillin, 1987
Primary
Picture book
Anna explores what nature has to offer in the grass and flowers.

Cooke, John. The Butterfly Cycle
Putnam, 1997
Primary, Intermediate
Informational
The lifecycle of a butterfly is explained.

Fowler, Richard. Ladybug on the Move
Gulliver Books
Primary
Picture book
Follow a ladybug and find out what it does all day.

Johnson, Sylvia. Chirping Insects
Lermer Publications, 1986
Primary, Intermediate
Informational
Learn about different insects and what makes an insect an insect.
Mound, Laurence. Insect Knopf, 1990
Primary
Informational
Information on insects are highlighted by interesting pictures.

Pallotta, Jerry. The Icky Bug Alphabet Book
Charlesbridge, 1986
Primary
Picture book
This is a fun book for teaching the alphabet to kindergarten students.

Sabin, Louis. Amazing World of Butterflies and Moths
Troll Associates, 1982
Primary, Intermediate
Informational
Information and pictures on moths and butterflies make this book a good classroom resource.

Selden, George. Cricket in Times Square
Dell, 1970
Intermediate
Modern Fantasy
Older students will enjoy the cricket's adventures while learning about crickets.

Soutter-Perrot, Andrienne. Ant
Creative Editions, 1993
Primary
Picture book
Children enjoy watching ants at work.

Taylor, Kim. Butterfly, See How They Grow
Dorling Kindersley, Inc., 1992
Primary
Informational
Butterflies complete their lifecycle.

Van Allsburg, Chris. Two Bad Ants
Houghton Mifflin Co., 1988
Primary
Modern Fantasy
Two ants want to take a crystal back to their queen ant.
CROSS-CURRICULAR ACTIVITIES
INSECTS

Science

Discuss three insect body parts: head, thorax, abdomen. Insects often have antennae, and four wings. To help students remember the body parts, have them construct an insect out of gumdrops.

Materials per child: 1 large gumdrop
2 small gumdrops
8 pieces of licorice whips
2 red hots
1 toothpick

Pass out all the materials to the students. Begin assembling the insect with the head. Push a toothpick through one of the small gumdrops. The toothpick should extend out the back of the head. Attach the second small gumdrop by pushing it onto the toothpick for the insect thorax. The large gumdrop is attached in the same manner for the abdomen. All the body parts should fit against each other. Next, push three licorice whips into each side of the middle section or thorax. The remaining licorice whips may be used as the antennae. Have students push them into the top of the head. The red hots may be pushed into the front of the head for the insect's eyes. Students should name the insect parts before they eat them. Remember to remove the toothpicks!

Observe An Insect (from Ranger Rick's Copycat Page). Take the students outside to look for insects. When each student has found an insect, have them record their findings on the Copycat Page. It's best to have students complete the page outside while observing the insect rather than capturing insects and removing them from their natural habitat. Let the students share their findings.

Math and Art

Have students complete a symmetry drawing of a butterfly picture. Students can use an insect guide to help them color in the final drawing. See activity.
Math

Give students a bar graph with pictures of different insects at the bottom. You could use the ones suggested or have the list based on insects found. Go on an insect hunt. Have students color in a block for each time they see a particular insect. After returning to class, total the insects observed the most and the least. See graph activity at the end of this unit.

Language Arts

After watching the video The Benefits of Insects, make a list of how insects are helpful. Then make a list of reasons why people don't like insects. Discuss both lists. Some possible answers follow.

Benefits- Plant pollinators
- Provide honey, wax, and silk
- Help control pests
- Are food for other animals and people
- Are fun to watch
- Indicators of water pollution

Disadvantages- Eat farmers crops
- Transmit diseases to people and animals
- Are household pests
- Bites and stings hurt
- Require the use of pesticides to control

So that students will remember the names of some insects, play insect bingo. See the game cards at the end of this unit.

Social Studies

Have a bee keeper visit the classroom to talk about bees and how honey is made, what to do if stung by a bee, and how to avoid being stung.

Visit a local citrus farm. Discuss with the farmer methods of pest control and how insects may help the fruit grow. Some farms do not spray pesticides as much as they use to. These farmers are able to use a biological method of pest control. For example, if a fruit farm is having a problem with a little white insects called aphids, the farmer may release a natural predator to eat the aphids. The natural predators of aphids are ladybugs. This method of pest control doesn't eliminate all the pests, but reduces the population to a reasonable amount.
Create an insect out of recyclable materials. Have students collect materials for several weeks. Once enough material has been collected, let students use their imagination to create an insect. Possible materials needed are scissors, glue, paint, markers, pipe cleaners, scrap construction paper, and other materials collected by the students. Allow students time to discuss their insect with the class.
Insect graph
* Color a box each time an insect is observed.
1. Draw a picture of your insect.

2. Describe where you found it.

3. What kind of insect do you think you have?

4. Why do you think it’s an insect?

5. How does it move?

6. What do you think your insect eats?

7. Make up a name for your insect based on how it looks.

8. Watch your insect for a few minutes. Make up a name for it based on how it behaves.

9. Name three things about your insect that help it to live where you found it.
<table>
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<td>bee</td>
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<td>Student Bingo Game</td>
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<td>Fly</td>
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APPENDIX

RAIN FOREST

APPENDIX
RAIN FOREST

A Resource Guide to be used in conjunction with Educational Outreach Programs on Rain Forest presented by the San Bernardino County Museum

by

Cindy Fullwiler
Introductory Note

Dear Educator:

The Teacher Resource Guides for the San Bernardino County Museum were designed to help you prepare or extend units presented by a museum outreach representative to students in classroom settings.

Each unit consists of three parts. First, a list of videos that are available for check-out at the museum is provided. Second, a recommended list of children's literature is included. Finally, cross-curricular activities are suggested which allow development of units beyond the science content.

One effective way to begin teaching these units is to collect the literature titles first. You should check your local libraries for the titles. Your may also want to ask your principal to purchase the literature. Once the books are collected, they can be put in a special area of the classroom library so that students have access to them.

You are encouraged to try the units and use them in your own creative way.
RAIN FOREST VIDEOS

Grade Key
Primary (K-3)
Intermediate (4-6)

El Gorila (Spanish)
National Geographic
60 minutes
Primary, Intermediate
Gorillas in their natural habitat are portrayed.

Saving the Gorilla
National Geographic
22 minutes
Senior
International effort aimed at the saving of gorillas in captivity is highlighted in this tape. Viewers become familiar with the problems associated with keeping and raising gorillas in captivity: boredom, inadequate maternal behavior, and neuroses.

Rain Forest Rap
World Wildlife Fund
6:26 minutes
Primary
This is a fun video for primary kids. You'll find your students singing the song long after the tape is over.

Rain Forest Voices
Nature Science Network
48 minutes
Primary, Intermediate
Filmed in Costa Rica, Rain Forest Voices blends recordings of the rain forest's sounds with an original score of new age music played on strings, keyboard, and ethnic instruments.

You Can't Grow Home Again
Children's Television Workshop
60 minutes
Primary, Intermediate
Filmed in Costa Rica, this video explains why rain forests are in the news, the effect rain forest destruction has on each of us, and what can be done to help rain forests survive.
Grade Key
Primary (K-3)
Intermediate (4-6)

Baker, Jeanine. Where the Forest Meets the Sea
Greenwillow, 1987
Primary, Intermediate
Picture book
A boy and his father marvel at the animal and plant life in the rain forest. As the boy describes the animals and plant life, he wonders if the rain forest will exist in the future.

Baptistia, Lynne Hardie. Rain Forest
Publications International, Ltd. 1992
Intermediate
Informational
This beautiful book with photographs shows exotic life forms, animals struggling to survive, and the layers of a rain forest.

Cherry, Lynne. The Great Kapok Tree
Harcourt Brace Javanovich, 1990
Primary, Intermediate
Picture book
As a woodcutter sleeps, the rain forest animals plead with him to stop chopping down their homes.

Cottenwell, Thelma. Aldita and the Forest
Houghton Mifflin, 1989
Primary, Intermediate
Fiction
A butterfly takes a journey through the rain forest.

Cowcher, Helen. Rain Forest
Farrar, Straus and Giroux, 1988
Primary
Picture book
When machines cut down the rain forest, the animals escape to higher ground. The machines are washed away by a flood because the land has been clear cut.
Dorros, Arthur. Rain Forest Secrets
Scholastic, 1990
Primary, Intermediate
Informational
This informational book gives a close-up look of life in the rainforest.

Ganeri, Anita. Explore the World of Exotic Rainforests
Western, 1992
Primary, Intermediate
Informational
Information about the rain forest and the people who call the rain forest their home are discussed in this book.

Gelman, Rita Golden. A Monkey Grows Up
Scholastic, 1991
Primary
Picture book
A monkey grows up in the rain forest. Learn about its daily routine and how it avoids natural predators.

George, Jean Craighead. One Day in the Tropical Rain Forest
Harper Collins, 1991
Intermediate
Fiction
A young boy discovers that rain forest land will be saved if rare animals inhabit the land. His story takes the reader on a journey to find a rare butterfly in order to save the forest.

Gibbons, Gail. Nature's Green Umbrella
Morrow, 1992
Primary, Intermediate
Informational
Facts about the rain forest are highlighted by beautiful illustrations.

Lewin, Ted. Tiger Trek
Macmillin, 1990
Primary
Picture book
Readers will experience a trip through the rain forest with a tiger and observe the forest as a tiger would.

Lewington, Anna. What Do We Know About the Amazonian Indians?
Peter Bredrick, 1993
Intermediate
Information
The life and culture of natives who live along the Amazon river are detailed.
Robins, Howard F. *Wonders of the Jungle*
National Wildlife Federation, 1986
All ages
Informational
Young children will love the pictures in this reference book. The text has diagrams as well as facts about animals and plants.

Sterry, Paul, and M. Robinson. *Rain Forest Nature Search*
Reader's Digest, 1992
Primary
Informational
A magnifying glass is attached to this book so that children can search for the hidden pictures. Teachers may want to purchase one or two extra magnifying glasses so that students can work together to find the pictures.
CROSS-CURRICULAR ACTIVITIES
RAIN FOREST

Science and Art

To help students understand the layers of the rain forest, construct a classroom rain forest using butcher paper. The forest should be floor to ceiling. Label the layers of the forest after it is completed.

Layers of a rain forest in order from bottom to top: floor, understory, canopy, and emergent. For more information on characteristics of each layer of the rain forest refer to Nature's Green Umbrella by Gail Gibbons.

Divide the class into four groups. Assign each group a layer of the rain forest to research. Research should include: characteristics of the layer assigned and animals who make that layer their home. A report of the findings should be shared with the class. Each group can construct appropriate animals and small plants to be placed in each layer of the rain forest.

Math

Using a yardstick or measuring tape, draw the height of rain forest trees on the playground. Trees in the emergent layer can be up to 200 feet tall. Canopy trees are slightly shorter at 75-150 feet tall. The understory trees are 4-12 feet in height.

Track the rainfall and temperature in your area for several months and compare them to that of a rain forest. Have a thermometer hanging outside the classroom. Pick a student to read the thermometer daily. Write down the information on a chart. Assign another student to look for the rainfall average in the newspaper, report to the class and record on a chart. Tracking the weather will help the students understand the differences in our climate and the rain forest. It will also help them with the math skill of reading and understanding temperatures.

The average temperature in a rain forest is about 86 degrees and at least 80 inches of rain falls each year. Equatorial rain forest are the wettest receiving up to one inch in half an hour. This is forty times more rain than is dropped in the northeastern United States. These rain forest don't have a dry season. The temperature averages 80 degrees F.. The temperature varies little from day to day.
Language Arts

Read a rain forest story while a cassette tape is playing with rain forest sounds in the background to help children visualize being in a rain forest. A rain forest tape may be purchased at a local music store.

Sing the Rain Forest Rap song (see video list) and write a new verse to the rap.

Social Studies

Read What Do We Know About the Amazonian Indians? by Anna Lewington. Discuss the native culture, how they survive, and how they help each other.

Distribute a map of the world and have students color in the locations of all the rain forest. See the activity at the end of this unit.

Art

Create a rain forest poster and write a slogan about how to save the rain forest.

To help students understand the variety of foods and products we get from the rain forest, make a college using pictures from magazines. Have students collect and bring to class magazines with food pictures in them. Discuss the products that come from the rain forests and make a list on the board. Have students look for and cut out pictures of rain forest foods found in their magazine. Teachers may want to set a time limit on this activity. Call on students individually to glue their picture on a large piece of tagboard for a food college. If students have a hard time finding a magazine picture, they may draw one.

Forest crops— banana, chocolate, avocado, pineapple, lemon, lime, coffee

rice, corn, sugarcane, tea

As an extension have a rain forest food party. Share some of the foods from the activity above.
APPENDIX

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WHALES AND SHARKS
WHALES AND SHARKS

A Resource Guide to be used in conjunction with Educational Outreach Programs on Whales and Sharks presented by the San Bernardino County Museum

by

Cindy Fullwiler
Dear Educator:

The Teacher Resource Guides for the San Bernardino County Museum were designed to help you prepare or extend units presented by a museum outreach representative to students in classroom settings.

Each unit consists of three parts. First, a list of videos that are available for check-out at the museum is provided. Second, a recommended list of children's literature is included. Finally, cross-curricular activities are suggested which allow development of units beyond the science content.

One effective way to begin teaching these units is to collect the literature titles first. You should check your local libraries for the titles. You may also want to ask your principal to purchase the literature. Once the books are collected, they can be put in a special area of the classroom library so that students have access to them.

You are encouraged to try the units and use them in your own creative way.
WHALE AND SHARK VIDEOS

Grade Key
Primary (K-3)
Intermediate (4-6)

Sea of Cortez
Cousteau, 1987
Intermediate and up
50 minutes
Witness the underwater courtship of giant manta rays and the feeding of finback whales.

Pacific Northwest: Land of the Living Totems
Cousteau
48 minutes
Intermediate
Humpback whales in their breeding grounds and the exploration of underground environments were beautifully filmed.

Cries from the Deep
Cousteau, 1981
99 minutes
Intermediate
Cousteau explores the wreckage of a 16th century Spanish galleon and follows the patterns of the humpback whale.

The Magnificent Whales
Smithsonian Books and Marine Mammals Fund
60 minutes
Primary, Intermediate
Enjoy these intelligent and inquisitive animals who breathe air as we do, yet their lives and habits seem so strange.

The Sharks
National Geographic
60 minutes
Primary, Intermediate
Meet sharks face to face at close range. Photography was done from a specially designed cage.
WHALE LITERATURE

Grade Key
Primary (K-3)
Intermediate (4-6)

Amour, Richard. Sea Full of Whales
Scholastic, 1974
Primary
Non-fiction
Using rhymes, students learn about whales and their behaviors.

Behrens, June. Whale Watch
Childrens Press, 1978
Primary
Informational
Students will read about what to expect on a whale watch trip.

Callenbach, Ernest. Humphrey the Wayward Whale
Heday Books, 1986
Intermediate
Non-fiction
This is a heart-warming story of a young humpback whale who accidentally entered the San Francisco Bay and swam 70 miles up the American River. Hundreds of people were involved in the effort to get Humphrey back to the sea.

Chapin, Tom. Sing a Whale Song
Random House, 1993
Primary
Fiction
When a boy's wish to become a whale comes true, he finds that all is not well in the ocean. A friend teaches him a song to sing to everyone so they would be more aware of how precious our Earth is. The cassette tape comes with the book.

Krulik, Nancy. Free Willy
Scholastic, 1993
Primary
Non-fiction
This is an emotional story of a troubled little boy who tries to rescue a whale in captivity. This book is also on video.
Lauber, Patricia. Great Whales: The Gentle Giants
Henry Holt, 1991
Primary, Intermediate
Informational
The characteristics of several different types of whales are discussed. Pictures show a size comparison of the largest to the smallest whales. There is a chapter devoted to why whales are a threatened species.

Mallory, Kenneth. The Search for the Right Whale
Crown Publishers, 1993
Primary, Intermediate
Non-fiction
This book describes what is so special about the Right Whale, why it's endangered, its migration patterns, and what scientists are doing to help them survive.

McNulty, Faith. Whales: Their Life in the Sea
Harper & Row, 1975
Intermediate
Informational
Detailed chapters on whales make this book a good resource for research.

Raffi. Baby Beluga
Crown Publishers, 1983
Primary
Picture Book
Students enjoy reading Baby Beluga, as well as singing the song. Raffi's Baby Beluga, the song, is also on cassette tape.

Simon, Seymour. Whales
Thomas Crowell, 1989
Primary, Intermediate
Informational
Beautiful photographs highlight information on various whales. This book explains where whales live, their needs, and physical characteristics.

Smyth, Karen C. Crystal: The Story of a Real Baby Whale
Down East Books, 1986
Intermediate
Non-fiction
Follow this baby whale through the seasons of its life. Find out what happens when it becomes caught in a fishing net.
SHARK LITERATURE

Grade Key
Primary (K-3)
Intermediate (4-6)

Bunting, Eve. The Sea World Book of Sharks
Harcourt Brace Jovanovich, 1979
Intermediate
Non-fiction
The shark's beginning in the dinosaur age to the present
day is the focus of this book. Close-up photographs show
different characteristics of sharks.

Carrick, Carol. Sand Tiger Shark
The Seabury Press, 1977
Primary
Non-fiction/picture
The life cycle of a mother sand tiger shark and her twin
pups are written in story form with pictures for young
children to enjoy.

Wheeler, Alwyne. Sharks
Gloucester Press, 1987
Primary, Intermediate
Non-fiction
The characteristics of sharks are described. A grid and
directions are provided at the end of the book for making
a life-size shark.

Zoelfeld, Kathleen W. Great White Shark: Ruler of the Sea
Smithsonian Oceanic Collection, 1995
Primary
Picture
A shark, two days old, tries to make her way in a vast
ocean. Her journey takes her through adulthood.
CROSS-CURRICULAR ACTIVITIES

WHALES and SHARKS

Science

Using the book Great Whales: The Gentle Giants by Patricia Lauber for information on whales, write characteristics of different types of whales on index cards for a guessing game. For example, all the characteristics of a humpback whale would be listed on an index card. Once the characteristics are listed, a student would be chosen to hold the card and answer yes or no to questions the class asks about the whale. Questions may be asked until someone can put all the clues together to guess the whale listed on the card. This game can be played with sharks too. A good resource for finding information on sharks is Sharks by Alwyne Wheeler. Both books are listed in the literature section of this resource guide.

Read the book Free Willy. After reading the book, have students identify the problem, people involved, possible solutions, and other possible outcomes from the story. This activity can be done as a whole class project or assigned individually.

Compare and contrast whales and sharks using facts from the first science activity listed in this section.

Math

Compare the sizes of whales. Have students work in groups to research the sizes of whales, using the books listed in the literature section of this resource guide. Some students may also want to go to the library to research.

Pilot whale-20 feet long
Beluga-18 feet long
Sperm whale-65 feet long
Killer whale-30 feet long
Pygmy Right whale-25 feet long
Sei whale-60 feet long
Right whale-55 feet long
Blue whale-100 feet long
Humpback whale-50 feet long

After students have gathered their information, have them find the difference between the smallest and largest whale. To help them understand a whale's
greatness in size, have them draw life-size replicas of the whales on the playground with chalk.

A blue whale eats about 4,400 pounds of krill a day. Blue whales weigh about 150 tons. Calculate the ratio of food a blue whale consumes daily compared to its body weight. Research the food consumption and body weight of other whales and make a ratio comparison. Do people have a similar food consumed to body weight ratio?

Language Arts

Write a whale poem in the shape of a whale or shark. See sample. Develop a word bank from reading, observing pictures, and watching videos.

Sing the Baby Beluga song and make up a new verse.

Baby Beluga
Raffi
Crown Publishers, 1983
The Baby Beluga book usually includes a cassette tape with the song. Check at a local book store to purchase the book.

Social Studies

Go on a whale watch trip. Contact the Whale Watchers at 1-310-831-0287.

Art

Using a 3x12 inch size paper, students can make a bookmark by drawing an ocean scene. Laminate them for long term use.
Whales big and heavy

Spashing, diving, feeding,

Takes care of its family, gentle giants

Whale shape poem
REFERENCES


