A thematic guide involving students in literature-based activities utilizing animals

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A THEMATIC GUIDE INVOLVING STUDENTS IN LITERATURE-BASED ACTIVITIES UTILIZING ANIMALS

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

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

by
Carole Anne Mattera and Patricia Anne Atherton

June 1994
A THEMATIC GUIDE INVOLVING STUDENTS IN LITERATURE-BASED ACTIVITIES UTILIZING ANIMALS

A Project
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Approved by:

Darleen Stoner, First Reader

Gary Negin, Second Reader
ABSTRACT

Regardless of age or grade level the most typical way of learning about animals in school has been watching movies, looking at pictures, or reading. All are relatively passive learning activities. This guide was developed to provide an activity-based curriculum for kindergarten through sixth grade students to enable them to learn about animals utilizing an interdisciplinary approach. It is a resource for teachers incorporating environmental education through the use of animals in the classroom and emphasizing related children's literature. The animals featured are: snails, spiders, frogs, turtles and tortoises, chickens, and snakes. Suggested activities for each literature book provide a hands-on, multi-disciplinary, literature-based, and animal-centered approach to enhancing children's appreciation of the natural world.
ACKNOWLEDGMENTS

We would like to thank our friends and families for their support and cooperation. Without their understanding this project would never have become a reality. A very special thanks to Dr. Darleen Stoner for the expertise and direction that she so generously bestowed.
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INTRODUCTION

The natural world piques children's curiosity and provides an excellent place for learning to begin. Most children have a natural affection for animals and are born with a sense of curiosity and a fascination about animal life. Curiosity and affection can provide a springboard to teach environmental concepts. Teaching environmental education through the use of animals may contribute to humility, a sense of wonder, and a connectedness to nature (Schicker, 1987). Schicker stated, "Day-to-day contact with the natural world, combined with participatory hands-on educational experiences, are the greatest and most effective methods for ensuring wildlife awareness and appreciation" (p. 14).

The teaching of environmental concepts can be done directly or indirectly using literature. It's Elementary (1992), a California State Department of Education document, stated that the curriculum should be organized around compelling literary works. Through literature other curricular areas can be addressed.

The Science Framework for California Public Schools: Kindergarten Through Grade Twelve (1990) stated that students should be "doing" science, not merely reading about it. Forty percent of the time spent on science should be activity-based and that these activities should be centered around a science theme.

This project is a resource for teachers, kindergarten through sixth grade, incorporating environmental education into the curriculum through the use of classroom animals. All activities in the
project provide a hands-on, multi-disciplinary, literature-based, and animal-centered approach to enhancing children's appreciation of the natural world.
REVIEW OF LITERATURE

This project focuses on using animals, children's literature and activity-based learning in the classroom as an excellent avenue for environmental education. The literature reviewed here provides a rationale for this approach. The literature is reviewed in terms of the following: definition of environmental education, children's attitudes toward animals, activity-based learning, the use of literature, and barriers to teaching environmental education.

Definition of Environmental Education

The Earth has often been compared to a spaceship whose inhabitants depend upon each other for survival. If this is true, then every action one takes must be done with consideration of the potential consequences both locally and globally (Engleson, 1985). Visualizing the Earth as a spaceship with a finite set of interdependent resources impresses upon one the need and importance of environmental education. Environmental education helps students become knowledgeable, skilled, and dedicated citizens, willing to work, individually and collectively, toward achieving and maintaining a dynamic equilibrium between the quality of life and the quality of the environment (Hungerford & Peyton, 1976).

The World's First Intergovernmental Conferences on Environmental Education convened in October of 1977 in Tbilisi, Georgia, USSR. Sixty-six nations and various nongovernmental agencies were represented. The participants at the conference
adopted a declaration addressing the need for environmental education. The Tbilisi Declaration (Engleson, 1985) established 5 recognized objectives of environmental education: awareness, knowledge, attitudes, skill, and participation. These objectives are interrelated, but are intended to be incorporated into the curriculum in a sequential manner (Engleson, 1985) as follows:

- Grades K-3 - awareness and attitudes
- Grades 3-6 - knowledge and attitudes
- Grades 6-9 - knowledge, skills and attitudes
- Grades 9-12 - skills, participation and attitudes

It is important to note that attitudes should be reinforced at every grade level. The attitudes developed in children carry over and influence their later actions as adults (Eagles & Muffitt, 1989).

**Children's Attitudes Toward Animals**

Little research has focused on children's relationships with animals. However, the studies that have been done focused on how attitudes toward animals develop and identifying the factors that influence these attitudes while people are young (Westervelt, 1983; Eagles & Muffitt, 1989).

The attitudes identified in a study by Westervelt (1983) were: humanistic (an interest and affection for individual animals, mainly pets), naturalistic (an interest and affection for wildlife), negativistic (a dislike or fear of animals), moralistic (a concern for the right and wrong treatment of animals), utilitarian (a concern for the practical and material value of animals), dominionistic (an interest in the
mastery and control of animals), and ecologistic (a concern for the interrelationships between wildlife and natural habitats). The most common attitude children held toward animals was found to be humanistic. The naturalistic attitude was the second most common attitude in children, being particularly strong in eleventh-graders. A general dislike and fear of animals were as common as the naturalistic attitude, suggesting some degree of conflict within and among young people about their feelings for animals.

Westervelt's study (1983) also concluded that children find domesticated, soft, or attractive animals more appealing. The most favorable animal was the dog. Invertebrate animals and animals perceived as unattractive and/or dangerous were the least preferred. There were several factors that influenced the development of attitudes toward wildlife from childhood to adulthood. Some of these influences were: age, sex, areas of residence, and ethnic background.

Young children have very strong negativistic feelings, dislike, or fear of animals, but the attitude begins to disappear as the children get older. On the utilitarian scale, Westervelt (1983) found that second-graders scored higher, indicating their relatively strong approval of practical and material uses of animals. However, second-graders had the least developed appreciation for ecological concepts. Fifty-one percent of the second-graders favored drilling for oil in an area where wildlife could be harmed. Regarding foxes that prey on farmers' chickens, 46% of the second-graders approved of killing the foxes.
Differences in attitudes toward animals were found to exist between males and females (Westervelt, 1983). Female children tended to be more humanistic, to have more concern for animal welfare problems, and to be more anthropomorphic and aesthetically oriented toward animals.

Animal preference also differed between the sexes (Kellert & Westervelt, 1985). Mammals and birds were popular with both sexes, but in grades 1-12 girls ranked fish, reptiles, and biting and stinging invertebrates much lower than did boys. Boys and girls between the ages of 4-10 years disliked spiders equally as much. However, by their teens there was a dramatic increase in the girls' negative attitudes toward spiders.

Children raised in rural areas expressed stronger utilitarian feelings toward animals (Westervelt, 1983). Those children from urban areas were more likely to express negativistic attitudes. The inner city children were the least concerned for animal welfare problems where by the children from the suburbs expressed the most concern.

Schicker (1987) stated that by the year 2000 over 90% of all Americans will live in urban areas. Westervelt (1983) concurred with this trend towards urbanization, and stressed that it will become more and more important to concentrate on these groups of children. Programs need to be developed that expand the understanding of the animal's world and provide opportunities for direct exposure to wildlife.
Westervelt (1983) stressed that it is time for our society to come to terms with the tendency for "emotional attachments to lovable and attractive animals and that a knowledgeable appreciation for animals as part of a natural system is relatively rare" (p. 25). If young people are to be prepared for dealing with serious environmental issues, then anthropomorphic orientations to animals will need to be redirected toward an educated concern for all life forms. Westervelt proposed that the strong humanistic and naturalistic attitudes found in young children will make the transition easier. The love for a soft, cuddly puppy can be turned into respect for it. The respect can then be redirected towards gaining an appreciation for the needs of all living things. Thus, focus in grades K-6 should be on identifying and dispelling fears about animals while increasing knowledge.

Children learn about living things by becoming involved with them. Children can learn a variety of concepts and attitudes by involvement with living things. Having animals in the classroom can teach children about animal's eating habits and responsiveness, and about gentleness, caring and nurturing (Wilson, 1993).

Activity-Based Learning

It's Elementary (1992) described the traditional approach to education, focusing on the acquisition of discrete academic skills by feeding children a diet of teacher recitations, drills, and rote exercises. Missing from the curriculum has been the opportunities for children to solve problems and creatively express ideas and
concepts. Brooks (1990) wrote that if the ultimate goal of educators is to help students build a foundation of skills and information while they simultaneously use their creative and intellectual abilities to solve problems, then a change in the approach to education is needed. The Science Framework for California Public Schools, Kindergarten through Grade Twelve (1990) and It's Elementary (1992) advocated a change to the traditional approach to education. The California guides stated that a model elementary school curriculum should include hands-on, student-centered, experiential based activities. In this type of instruction, the learning of content and skills is still the educational goal. However, students need to make discoveries and experiment with knowledge (Brooks, 1990).

Participation in animal-oriented activities impact children's attitudes. Kellert & Westervelt (1985) reported, that if one were to change attitudes, education without an experiential component may not be effective.

Use of Literature

Wilson (1993) found that children's literature can be a valuable resource in fostering positive attitudes about the environment. O'Brien and Stoner (1987) stated that a careful selection of literature can help students understand environmental concepts and arouse interest in the natural environment. The teaching of environmental concepts can be done directly or indirectly using literature. It's Elementary (1992) stated that the curriculum should be organized around compelling literary works. The English-Language Arts
Framework for California Public Schools, Kindergarten Through Grade Twelve (1987) also recommended a literature-based approach to reading and learning. Recommended was: (1) using quality children's literature as the core of the curriculum; (2) using the whole language approach; and (3) teachers select the reading books. Through literature other curricular areas can be addressed.

Barriers to Teaching Environmental Education

The celebration of the first Earth Day in the early 1970's brought the beginnings of the environmental movement. The general consensus was that the teaching about the environment should fall on the shoulders of educators. A look in the classrooms today tells us that although teachers believe in the importance of environmental education, it is not being taught (Ham & Sewing, 1987).

Several studies have been made to determine why environmental education is not being taught (Ham & Sewing, 1987; Ramsey, 1992; Simmons, 1989). Barriers to environmental education tended to be lack of a science background, not enough time in the school day, and lack of suitable materials.

Environmental education can be incorporated in every curricular area at every grade level. According to Simmons (1989) the infusion of environmental education into the curriculum is beneficial in that environmental education does not become another add-on subject in an already overburdened schedule. It just takes a little extra time to teach the concepts, issues, and concerns.
Unfortunately, environmental education has been taught as an enrichment subject in the science program. Simmons (1989) found that by emphasizing the sciences in environmental curriculum materials, many teachers who are fearful of science may be scared away. Teachers need to be shown that a strong science background is not needed to teach environmental education. Current materials rely heavily on science and social studies, necessitating the development of new materials with activities in mathematics, art, music, and health.
GOALS AND OBJECTIVES

The overall goal of this project is to facilitate the instruction of environmental education through an activity-based approach using classroom animals and children’s literature for grades kindergarten through sixth grade.

In order to achieve this goal, the following objectives were:

1. Develop a teacher's guide for six types of animals, select outstanding children's literature for each, and select or develop activities.

2. Field test these activities with students in our classes. Have other teachers also field test these activities.
DESIGN OF PROJECT

The guide's curriculum consists of 6 units involving students in literature-based activities utilizing animals. The units of study are: (1) snails; (2) spiders; (3) frogs; (4) turtles and tortoises; (5) chickens; and (6) snakes.

Each unit has 3 parts. First, a fact sheet provides the teacher with valuable information about the animal of study. Next, the unit is separated into primary and intermediate grades, each including a suggested fiction literature book, discussion questions, environmental topics and concepts, and a wealth of activities in all subject areas. Finally, a list of related literature books is provided. All activities in the guide are original or adapted from those found in an extensive search of curricular guides. The activities were field tested with our own students and students of four other teachers to assure their success.
IMPLICATIONS FOR EDUCATION

This project's curriculum is not only adaptable to environmental education, children's literature, and study of animals, but to all subjects being taught in elementary schools today. This project provides educators with numerous activities that can be used in an already existing curriculum to enable an integrated approach to teaching about animals.

Ham and Sewing (1987) found that, although educators feel that environmental education is an important subject, they do not teach it due to perceived barriers. Some of the barriers are: environmental education is another add-on subject in an all ready full day, the lack of materials, and the need to be knowledgeable in science. This project is a useful tool in overcoming these barriers.

The activities were field tested in six classrooms, including our own. The teachers who worked with this project felt that this was an effective curriculum utilizing hands-on, multi-disciplinary, literature-based, and animal-centered activities. The students were enthusiastic, and enjoyed learning.
APPENDIX: ANIMAL UNITS
SNAIL FACTS

* SNAILS ARE ANIMALS THAT ARE KNOWN AS MOLLUSKS.

* SNAILS HAVE SOFT BODIES THAT ARE PROTECTED BY A COILED SHELL CALLED A WHORL.

* SNAILS CRAWL ALONG ON A MUSCLE CALLED A FOOT WHICH IS PROTECTED BY A LAYER OF SLIME.

* THERE ARE TWO SETS OF TENTACLES LOCATED ON THE SNAIL'S HEAD. THE SNAIL'S EYES ARE LOCATED ON THE TIPS OF THE LONGER PAIR OF TENTACLES. THE TWO SHORTER TENTACLES ARE USED TO FEEL OBJECTS IN ITS PATH.

* THE SNAIL'S MOUTH IS LOCATED ON THE FRONT OF ITS HEAD. THE MOUTH HAS TINY TEETH WHICH ARE ATTACHED TO THEIR TONGUES (RADULA).

* THEY USE THEIR TONGUE TO SHRED THEIR FOOD INTO SMALL PIECES.

* THERE ARE 80,000 DIFFERENT KINDS OF SNAILS.

* SNAILS LIVE 2-20 YEARS.

* SNAILS ARE FOUND IN FRESH WATER, SALT WATER, AND ON LAND.

* THE COMMON GARDEN SNAIL (HELIX) IS EATEN AS ESCARGOT.

* MOST SNAILS HAVE LUNGS.
* Snails are hermaphrodites which means that each snail has both male and female reproductive organs.

* If the environment becomes unfriendly to the snail, it will form a seal over its opening and remain dormant for up to two years or until the environment becomes more favorable.
THE SNAIL'S SPELL (PRIMARY)

Ryder, Joanne and Cherry, Lynne
Scholastic Inc., 1991
Primary
Picture Book

A young child imagines that he shrinks in order to experience the world of a snail. The Snail's Spell is a good book for establishing empathy with snails. It is beautifully illustrated.

Environmental Topics: natural habitat, agriculture

Environmental Concepts:
1. In any environment, living things have similar needs.
2. Animals need green plants and other animals for food.
3. An animal's habitat is composed of food, water, shelter, and space.
4. Living things return matter to the environment.

Discussion Questions:
1. How do some things look different when you are as small as a snail?
2. What are some of the advantages and disadvantages of being small?
3. How do snails get around in their environment if they have such terrible eyesight?
4. How would you feel if something much larger approached you?

INTEGRATING INTO THE CURRICULUM:

MATH
WEIGHING:
1. Weigh the snails using arbitrary units of weight such as washers, blocks, or marbles.
SNAIL RACES:
1. Measure the distance a snail travels by having snail races.
2. Predict which snail will travel the farthest in a set amount of time.
3. When the race is completed use a string to measure the distance each snail traveled. Do this by laying the string along the slime trail.
4. Cut the strings and compare the distances.

NUMERAL RECOGNITION:
1. Snails can be kept in a large classroom aquarium.
2. So that each child can identify their own snail, place a number on them. Do this by placing a spot of correction fluid on each snail. When the correction fluid dries, write a number on it.
3. The children will eventually recognize their own snail by the number on its shell. They will also begin to recognize other children's snails by the numbers.

LANGUAGE ARTS
SNAIL BOOKS:
1. Ask children to dictate or write a sentence about a snail. Begin with "I am a snail and I..."
2. The children can illustrate their sentences.
3. A class book can be made and bound in a snail-shaped cover.

SNAIL TRAIL BOOK:
1. Create a book about a snail looking for food.
2. Help the children learn various prepositions having the snail travel:
   a. around a pond.
   b. over a hill.
   c. through grass.
   d. between rocks.
   e. in a cave.
3. Each page of the book depicts a preposition. Wet chalk is used to create the slime travel that show where the snail travels.

SNAIL WORDS:
1. Brainstorm descriptive snail words.
2. Write them down on a large, snail-shaped paper.
3. Use these words for vocabulary development, spelling words, or writing assignments.

SCIENCE
SNAIL OBSERVATION:
1. Give each child a clear, plastic cup in which to place own snail.
2. Observe various body parts:
   a. Find its mouth.
   b. Touch its antennas; what happens?
   c. Watch for the rippling of the muscles in the snail's foot as it moves.
   d. Is there a slime trail?

HUNGRY SNAILS:
1. Provide four to five food items such as: lettuce, corn meal, luncheon meat, or bananas.
2. Have the children predict which food the snails will prefer to eat.
3. Feed the snails each of the food items. Which food was preferred?
4. Graph the results and compare with the predictions

SNAIL COOKIES:
1. Make snail cookies using sugar cookie dough. It may be purchased in a store pre-made.
2. Give each child a one inch ball of cookie dough.
3. Have the child roll the dough into a long snake, then coil it into a snail.
4. Two raisins are used for the eyes; four almond slivers create the antennas.
5. Bake according to the directions on the package or recipe.

SNAIL CENTER:
1. Create a science center where the children can observe the snails during free time or as part of a learning center. Place an aquarium of snails at a table. Provide non-fiction books (see snail bibliography), magnifying glasses, art paper, markers, and journals for writing observations.

SOCIAL STUDIES
ANIMAL HOMES:
1. Discuss where animals live. Draw pictures of various animal homes and write (dictate) a story about them.

FEELINGS:
1. Empathy plays an important role in the development of a real understanding of nature. Reread the book *The Snail’s Spell*. Have the children become the little boy in the story. Discuss how they would feel if they were the child in the story. How did it feel to become a snail? How did the world look to them? Provide different situations and ask how they would feel if they were snails, i.e., a small child picks them up or a bird approaches.

FINE ARTS
SNAIL TRAIL:
   Materials: white art paper    marbles
              gift box         colored tempera paint

1. Place the paper in the gift box.
2. Dip the marbles into different colored tempera paint.
3. Place the wet marbles into the box and roll them around.
4. A trail will be created.
MORE SNAIL TRAILS:

Materials: snails  butcher paper  tempera paint

1. Pour 1/2 teaspoon of tempera paint on a large piece of butcher paper.
2. Place snails in the paint.
3. Trails will be created as they crawl away. Tempera paint is non-toxic so it will not harm the snails.

PAPER WEIGHTS:

Materials: plaster of paris  various mollusk shells
           strips of chart paper  red clay

1. Press the shell of a sea snail into a slab of red clay to form an impression.
2. Form a collar with chart paper, making it slightly larger than the snail shell impression.
3. Press the collar into the clay, around the impression. This will contain the plaster of paris when it is poured.
4. Fill with plaster.
5. Let dry; then remove.

SNAIL PUPPETS:

Materials: bakers clay  barbecue skewers
           beads  artificial flower stamens

1. Using baker's clay make a snake; then coil it into a snail-shaped.
2. Decorate the snail using two beads for eyes, artificial flower stamens for the antennas.
3. Insert a bamboo barbecue skewer in the bottom for the handle.
THE BIGGEST HOUSE IN THE WORLD:

construction paper scraps  scissors
pipe cleaners  glue
6 x 12 piece of paper

1. Read the book.
2. Give each student a piece of construction paper (6 x 12") as a snail base and a pipe cleaner for the antennas.
3. Place scrap paper of various colors and sizes in the center of the worktable. Students construct free standing, multi-dimensional snail shells on their bases.

PHYSICAL EDUCATION
SNAIL SPIRALS:
1. Form a circle, holding hands and facing each other. The leader (teacher) only will break the circle and begin walking around the inside of the circle, leading the student line as she/he goes to make a spiral.
2. When the spiral is complete and all the students are moving, the leader turns in the opposite direction to head out of the spiral.
3. When the student line is completely out of the spiral the leader again connects hand to form a circle. When the circle is connected again the student's back will be towards the center of the circle.
4. Chant to accompany movement:
   Snail, snail come out to be fed.
   First your antennas, then your head.
   Then your Papa and your Mama
   Will give you fried chicken.
SNAIL HOPSCOTCH:
1. Using chalk, sketch out a snail hopscotch on the black top.
2. Number the squares 1-20.
3. Have the students hop to the middle (home) in one continuous turn, and then back out again.
4. Bean bag games can be devised to help with numeral recognition and counting.
Many people feel snails are pests. However, there are many species of snails that are helpful. Snails are nature’s carpet sweepers. They help to recycle decaying plants, leaves, and fruit. This book provides information about habitat, body structure, and species variety. The text and illustrations are simple and well done.

Environmental topics: natural habitat, recycling, integrated pest management

Environmental Concepts:
1. Living things in the environment are in constant change.
2. Living things are interdependent with natural and physical environment.

Discussion Questions:
1. What is the broad muscle called that helps the snail move?
2. Why doesn’t the snail get cut on sharp objects as it travels?
3. The book mentions that the snail is a member of Nature’s Sanitation Corporation. What does this mean?
4. How many different kinds of snails are there in the world?
5. Since the snail’s shell is its only protection, what does it do in case of danger?
6. What are some of the snail’s predators?
7. If you moved as slow as a snail, what kind of dangers would you have?
INTERGRATING INTO THE CURRICULUM:

MATH
MEASURING:
1. Snails are excellent subjects for metric measurement. The upper tentacles will measure twenty millimeters in length. The lower tentacles are about ten millimeters long. Depending on the age of the snail, the foot will vary in length from thirty to seventy millimeters. Very young snails may be even smaller.
2. Distribute snails and metric rulers to the students. Explain that millimeters are the smallest unit of metric measurement in common use and show them that each line represents a millimeter. You may want to teach the students that ten millimeters equals one centimeter.
3. Have the students measure the features of the snail and answer the following:
   a. How many millimeters long is the snail’s upper tentacle?
   b. How many millimeters long is the lower tentacle?
   c. How many millimeters long is the foot of the snail?
4. Have the students compare a young snail and an adult snail. Use a ruler to compare the size of their features. Have the students answer the following:
   a. How many millimeters longer is the adult snail’s foot?
   b. How many millimeters longer is the adult snail’s upper tentacle?
   c. Compare the size of two other features of the snails using your ruler.

LANGUAGE ARTS
POETRY:
1. Fill the bottom of a pan with about 1/2 inch of colored water.
   (Use various food colors; they are nontoxic to the snails)
2. Put the snails on white paper and let them leave a colored trail. Put different snails down they will trail different colors for variety.

3. Have students compose snail poems and write them on the dry colored snail paper. For example:

   Sliding on my belly
   Nature's recyclers always working
   A bit blind and very slow
   In gardens and yards
   Lovable and helpful

SCIENCE

BODY PARTS:
1. Have students read about snail body parts. Have them draw a snail and label the different body parts.
2. Have students imagine that they are a slow moving snail. Have them create a "Snail's Pace" adventure story, and illustrate it.

OBSERVATION: SNAIL WATCHERS:

<table>
<thead>
<tr>
<th>Materials:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand lens</td>
</tr>
<tr>
<td>snails</td>
</tr>
<tr>
<td>cornmeal</td>
</tr>
<tr>
<td>clear acetate (optional)</td>
</tr>
<tr>
<td>centimeter rulers</td>
</tr>
<tr>
<td>a small scale</td>
</tr>
</tbody>
</table>

1. Secure at least one snail per child. Snails are easy to find at night in most gardens near ground cover and wet areas. They can be kept in a covered container (with air holes) and fed lettuce.
2. Tell the students that they will be observing their own snails.
3. Discuss the snail's body parts with the students using the sheet provided.
4. Using the hand lens, observe your snail carefully. Have the children locate these body parts:

   eyes   tentacles for feeling
   anus   edge of mantle
   mouth  body whorl
   foot   respiratory pore
   apex of shell
5. Sprinkle some cornmeal in front of your snail so you can observe it eating. How would you describe the snail's manner of eating? (optional) Place snail on clear acetate, lift the sheet and look beneath to see the radula working.

6. Arrange objects in an obstacle course for your snail to get over. Watch the layer of slime that it produces to slide on.

7. On a piece of paper have the children record the following:
   a. Gently touch the optic antenna and record the results.
   b. Touch one of the shorter antenna and record the results.
   c. Height of snail (to top of shell) ________________cm
   d. Weight of snail ________________
   e. Allow the snail to stretch out on your ruler. Take three different measurements of what you think its full body size is. Then average the numbers to get the length of your snail.
   First try_____________________
   Third try ___________________
   Average body length___________

8. Have the students make a bar graph of the length, height, and mass of each snail.

SOCIAL STUDIES

GEOGRAPHY:
1. Research snails and find out where they live around the world.
2. Each child will make a world map of where they would find their snail.
3. They will indicate the specific location on their map with a small picture of their snail.

INTEGRATED PEST MANAGEMENT: WHAT ABOUT PESTICIDES?:
1. Some people think snails are pests because they nibble on fresh garden plants and crops. What most people don't know is that there are many species that are helpful to us. They are nature's recyclers.
2. Discuss how people can be pests at one time or another in their lives.
3. Have children share their life experiences with the class to gain an understanding of the word "pest." How did others feel about you?
4. Discuss pest control with the class and ask the following:
   a. Are all insects you see pests?
   b. What benefits do some insects give to people?
   c. Why do some people use so much insecticide?
   d. Do you think people worry about insects going extinct?
5. Graph the results of the survey with the class.
6. Discuss alternative ways to keep snails out of your garden, e.g., put dishes of stale beer around your garden.

FINE ARTS
ART: YARN SNAIL ORNAMENTS:

Materials:  various colors of yarn  white glue
            picture of a snail  wax paper
            string

1. Give each child a simple picture of a snail and a piece of waxed paper the same size as the picture.
2. Place the waxed paper on top of the picture. You should be able to see through the waxed paper.
3. The children then trace the picture using the colorful yarn. (Do not glue anything yet)
4. Once the yarn is in place, cover the entire yarn snail with glue. Be sure to cover it entirely.
5. Set aside to dry for two days or until dry and stiff.
6. Peel the ornament off the waxed paper and add a string to hang in your favorite place.
ART/PHYSICAL EDUCATION

SNAIL IN THE MIDDLE:
1. You will be building a vision simulator to provide a simulation of a snail's limited vision.
   Materials: large grocery bags wax paper
              masking tape flashlight(s)
              pieces of rough cloth (burlap)

2. Cut a window in the grocery bag about 15 cm long by 10 cm wide. Place the window at eye level when the bag is placed over the child's head.
3. Tape a sheet of waxed paper over the window. You're done!
4. To start game:
   a. Play the game in a relatively shady area.
   b. Form a large circle and sit on the ground.
   c. One child goes to the center of the circle wearing vision simulator.
   d. A flashlight is quietly passed around the circle.
   e. At a signal, one child in the circle turns on the flashlight and shines it on the vision simulator (child in the center).
   f. The child in the middle tries to point in the direction of the light, if the child is successful, he/she switches places with the child holding the flashlight and the game continues!

SNAIL SOCCER:
1. This game should follow the same rules as soccer but has to be played on a court that is half the size of a soccer field.
2. All children are to be in the snail soccer position at all times. Each child has their two hands and feet on the ground with their bellies facing upward. Pushing themselves up off the ground they may scoot around the field but may not use their hands to touch the ball.
3. The rules of soccer, now apply.
The Body of a Snail

A - Eyes
B - Tentacles
C - Mouth
D - Nerve Centers
E - Stomach
F - Salivary Gland
G - Kidney
H - Heart
I - Shell
J - Intestine
K - Ducts of Digestive Gland
L - Digestive Gland
M - Tail
N - Foot
BIBLIOGRAPHY

Byars, Betsy Cromer. **The Lace Snail**
Viking Press, 1975
Primary
Modern Fiction
One day a snail is on her way to the pond when she began to leave a trail of silken white lace behind her. The animals she meets on the way beg snail for some of her lacy trail. She tries to oblige each with a gift appropriate to its nature.

Edwards, Hazel. **Snail Mail**
Collins Publisher, 1986
Primary, Intermediate
Modern Fiction
This is a story of a snail who enjoys a variety of foods. He moved from the vegetable garden to the mail box. He discusses his "read-eats" of the past week. The story ends as the snail moves to a car where he eats a map and perhaps travels to a farm for more adventures.

Giganti, Paul. **How Many Snails?**
Greenwillow Books, 1988
Primary
Picture
This is not only a counting book, but it encourages readers to search for details.
Hogner, Dorothy. *Snails*
Crowell, 1958
Intermediate
Informational
This book covers the parts of a snail, how it reproduces, its behavior, and its enemies. How to keep a snail as a pet it also presented.

Johnson, Sylvia. *Snails*
Lerner Publication Company, 1982
Intermediate
Informational
This book discusses numerous types of snails, with an emphasis on land snails. It also contains many colored photographs and an extensive glossary.

Lionni, Leo. *The Biggest House in the World*
Alfred A. Knopf, Incorporated, 1968
Primary
Modern Fiction
A little snail tells his father that when he grows up he wants the biggest house in the world. "Some things are better small," says his father. Father then tells a story of a snail who wanted the biggest, most beautiful house in the world. This snail found that by twisting and twitching and moving his tail swiftly from left to right he could get his wish. Eventually all of the food was eaten and the snails must move on if they were to survive. Unfortunately the snail with the biggest house in the world is too bulky to go anywhere. He is left behind. Without any food he slowly fades away.
O'Hagar, Caroline. *It's Easy to Have a Snail Visit You*  
Withrop, Lee and Shepard Books, 1980  
Primary  
Informational  
This book has excellent information on the collection and keeping of snails as pets.

Olsen, Jens. *Snails*  
Silver, Burdett Press, 1985  
Intermediate  
Informational  
This book examines the characteristics and behavior of the snail and follows the life cycle from mating to hatching to growth into adulthood.

Simon, Hilda. *Snails of Land and Sea*  
The Vanguard Press Inc., 1976  
Intermediate  
Informational  
A comprehensive book detailing all biological aspects of the snail's life. It contains numerous illustrations, is more advanced, and is a good reference.

Stadler, John. *Hooray for Snail!*  
Harper and Row, Publishers, 1985  
Primary  
Modern Fiction  
Snail hits the ball so hard during a baseball game that it goes to the moon and back again. Remember how slow a snail is. Will snail get a home run or will he be out?
Stadler, John. Snail Saves the Day
Harper and Row, Publishers, 1985
Primary
Modern Fiction
It is the day of the big football game, but snail oversleeps. As the game progresses, his teammates frantically wonder where snail is. Snail is awaking, brushing his teeth, and hurrying to the stadium. Will he make it in time to save the day?

Ungerer, Tomi. Snail. Where Are You?
Viking Press, 1966
Primary
Picture Book
There is no story, just pictures using a snail shell on each page. Can you find the snail?

Zim, Herbert S. and Krantz, Lucretia. Snail
William Morrow and Co., 1975
Intermediate
Informational
This book discusses land and sea snails. It has delightful illustrations.

TEACHER RESOURCES:
BOOKS:
AIMS. Critters
AIMS Educational Foundation, 1989

RECORDS:
"Just a Snail" Spin, Spider, Spin
Educational Activities, Inc.,
Henri L' Escargo. Look, Listen and Sing Series (Jack Miffleton)
World Library Publications
5040 N. Ravenwood
Chicago, Ill., 60640
SPIDER FACTS

* SPIDERS ARE ARACHNIDS. THEY HAVE EIGHT LEGS AND TWO BODY PARTS. SPIDERS DO NOT HAVE ANTENNAE OR WINGS.

* MOST SPIDERS HAVE EIGHT EYES BUT SOME HAVE TWO, FOUR, SIX EYES.

* THE HARD SKELETON THAT COVERS THE OUTSIDE OF ITS BODY IS CALLED THE EXOSKELETON.

* THERE ARE TWO TYPES OF SPIDERS: WEB BUILDERS AND WANDERING SPIDERS.

* DIFFERENT SPIDERS MAKE DIFFERENT KINDS OF WEBS.

* ALL SPIDERS HATCH OUT OF EGGS WHICH ARE PROTECTED BY AN EGG SAC.

* BABY SPIDERS ARE CALLED SPIDERLINGS.

* SPIDERS PRODUCE A THICK LIQUID CALLED SILK. IT HARDENS AS SOON AS IT LEAVES THE SPINNERETS.

* THE SILK IS USED TO TRAP INSECTS, TO MAKE WEBS, AS DRAGLINES, FOR EGGS SACS, AND MORE.

* SPIDERS ARE CARNIVORES AND PREDATORS. THEY EAT INSECTS AND SMALL ANIMALS.

* ALL SPIDERS HAVE VENOM. MOST ARE NOT POISONOUS TO HUMANS EXCEPT THE BLACK WIDOW AND BROWN RECLUSE.

* SPIDERS INJECT THE VENOM THROUGH THEIR FANGS AND THIS PARALYZES THE PREY. THEY EAT BY SUCKING OUT THE LIQUID FROM THE BODY.

* SPIDERS MOLT OR SHED THEIR SKIN AS THEY GROW.
BE NICE TO SPIDERS (PRIMARY)

Harper and Row, 1967
Primary
Modern Fiction

The zookeeper finds a box on the steps of the zoo with a note attached. The note reads, "Please look after Helen...I can't keep her anymore." When the box is opened Helen crawls out and quickly disappears into the zoo. The zoo animals have been plagued by flies. Helen spins her webs and catches them, making the zoo a happy place.

Environmental Topics: spiders, life cycles

Environmental Concepts:
1. In any environment, living things have similar needs.
2. Some animals are herbivores and other are carnivores.
3. An animal's habitat is composed of food, water, shelter, and space.
4. Living things are adapted to and dependent on the environment in which they live.
5. A specific predator-prey relationship forms a food chain.

Discussion Questions:
1. Where does Helen live?
2. Name several animals at the zoo.
3. Why are the animals so unhappy?
4. How does Helen make them happy again?
5. Are spiders useful? Why or why not? Because...

INTEGRATING INTO THE CURRICULUM:

MATH
SPIDER HEADBANDS (PATTERNING):

Materials: ditto with two types of spiders, (four of each kind)
a 3 x 18 inch strip of construction paper (headband)
1. Students will cut apart the spider ditto.
2. Students will glue the spiders onto the strip of paper in a pattern - AB, AAB, or ABB.
3. The completed strip of paper will then be stapled into a headband.

SPIDER COUNT:
   Materials: plastic spiders
cards with spider webs and a numeral on them.

1. The students will set out all the cards, then place the appropriate amount of spiders on each card.
2. Help the student recognize numerals and gain number concept.

SPIDER PROBLEMS:
1. Create word problems using spiders and insects.
   a. 16 spiders were on a web, 7 fell off. How many are left?
   b. 14 spiders, 3 caught food. How many did not catch food?
   c. One wolf spider carried 7 babies on her back. The other wolf spider carried 10 babies on her back. How many babies are there in all?

LANGUAGE ARTS
SPIN SPIDER TALES:
1. Have the students write spider tales using the five step writing process: prewriting, drafting, revising, proofreading and publishing. Possible story starters are:
   a. My pet spider goes with me everywhere I go. One day he...
   b. If I had a pet spider I would...
   c. I crawled into bed and awoke tangled in a spider's web. I...
SPIDER POETRY:
1. Have the students write acrostic poems using the word SPIDER.
   S
   P
   I
   D
   E
   R

SCIENCE
SPIDER BODIES:
1. Discuss the body parts of the spider and complete a spider diagram.
   a. two body parts: head and abdomen
   b. eight legs
   c. fangs
   d. spinnerets
   e. eyes

2. Discuss how spiders are different from insects. How are they the same?

SPIDERS:
1. Study the following spiders:
   a. Wolf Spider
   b. Trapdoor Spider
   c. Crab Spider
   d. Jumping Spider
   e. Tarantula
   f. Black Widow

2. Discuss where they live, what they eat, how they catch their food, their color, and any other interesting facts about these spiders. Discuss whether each spider is a web builder or a wanderer. Students can complete a spider report on one of these spiders.
SOCIAL STUDIES
BEING HELPFUL:
1. Spiders are always thought of as creepy critters. But they are helpful in keeping down populations of flies and other insects. When have you ever felt like you could have helped a situation when someone else needed help?
2. In small groups:
   a. Each child will talk about when they helped someone in need.
   b. Each group will be given a situation card about a time when someone needed help.
   c. Each group will act out the situation on the card in front of the class.
   d. The other class members will try to guess what helpful deed was done.

FINE ARTS
CLAY SPIDERS:
   Materials: eight pipe cleaners or craft sticks
              clay- mix: 2 cups of flour
                        1 cup of salt
                        black tempera paint (add until a clay consistency is formed)
1. Mold the clay into a spider body shape.
2. Insert the pipe cleaners or black painted craft sticks into the clay for legs.
3. Allow the spider to dry.
4. When the spider is dry paint on the details such as eyes.

POSTERS:
1. Have the students make a poster saying why it is important to be nice to spiders.
HEADBANDS:
1. Create a spider headband by gluing a circle onto the front of a paper headband. Cut two paper circles for the eyes and glue them on.
2. The legs are made of 1 x 8 inch pieces of paper that are accordion folded and glued on either side of the head.

PHYSICAL EDUCATION
PLACE IN THE WEB:
1. The students will sit in a circle.
2. One student ("IT") will walk around the circle tapping each child on the head saying, "Fly, fly, spider."
3. The child whose head was tapped and named spider will hop up and run in the opposite direction as the tapper. The object is to return to your spot before the tapper gets there.
4. The child who does not make it back in time, will get eaten by the tapper spider and will sit in the center of the circle.
5. The students can race around the circle using various modes of movement such as hopping, skipping, or jumping.

ZAP THE INSECT:
Materials:   squirt bottle   a set of keys
            blind fold

1. Discuss with the students the relationship between predators (spiders) and prey (insects).
2. Form a large circle. Chooses one child to be a spider. The rest become insects.
3. The spider goes to the center of the circle, is blindfolded, and given a squirt bottle filled with water.
4. The set of keys are place on the ground in front of the "spider."
5. Carefully twirl the person in the center around several times.
6. The teacher chooses one of the children on the outside of the circle (insects) and that child tries to slowly move in and take the keys.
7. The object of the game is for the spider to hear the insect coming and zap (squirt) it.
8. If caught by the spider the child switches places in the center.
Wilbur, a young pig, is saved from death by Fern Arable. Fern raises Wilbur at her uncle’s farm. In the farmyard Wilbur meets a spider named Charlotte. It is time to slaughter the pig, so Charlotte saves Wilbur’s life by writing wonderful words describing Wilbur in her web. The owners of the farm, the Zuckermans, feel it’s a miracle and spare Wilbur’s life. Charlotte is preparing to lay her eggs and becomes weak. Wilbur can’t understand why Charlotte has to die. Charlotte’s eggs hatch in the spring and Wilbur gains many new friends.

Environmental Topics: seasonal changes, farm animals, life cycles

Environmental Concepts:
1. Living things are interdependent with their natural and physical environment.
2. People interact mentally and emotionally to the objects and events in their environment.
3. Living things and environments are in constant change.

Discussion Questions:
1. Look at the cover of the book. Can you find any clues about the story? the characters?
2. Where does the story take place?
3. Name several animals that live on a farm.
4. How does Fern stop her father from killing the runt pig?
5. Wilbur was an unusual pet (not like a cat or dog). What are the advantages of having a pet like Wilbur? Disadvantages?
6. After reading Chapter 5, how does Wilbur feel about Charlotte's method of catching food?
7. Why does Charlotte say it's good for spiders to eat bugs?
8. What happens if there are too many predators and not enough prey?
9. In Chapter 9, Wilbur tries to make a web. What does Charlotte have that Wilbur does not?
10. Compare and contrast Charlotte to a real orb spider.
11. How is Charlotte's trick going to save Wilbur?
12. What's the real purpose of the title in Chapter 15, "The Crickets?"
13. In Chapter 15, what is Charlotte worrying about?
14. Charlotte is not herself. Find clues in Chapter 17 to what may be wrong.
15. What is a masterpiece?
16. Charlotte made the egg sac. What's beginning to happen to Charlotte? Why?
17. The spiderlings travel to new home sites. Why wouldn't all the spiderlings stay at the barn?
18. What special adaptation did they use for traveling?
19. What did Wilbur learn?
20. How was the setting important?
21. What was the author's message? What do you think is the most important thing to remember about the story?

INTEGRATING INTO THE CURRICULUM:

MATH
GRAPHING:
1. Take a survey of class members to discover their reactions to spiders. Estimate before taking the survey how many students would like a pet spider. Take an actual class count. How did the estimate and survey compare?
2. Graph the responses on the bar graph provided.
MEASUREMENT
CANDY SPIDER WEBS:
Materials:
- 4 cups light corn syrup
- 2-2/3 cups flour
- 1/4 tsp. food coloring
- few drops flavoring
  (vanilla, peppermint, lemon extract)
- margarine
- 30-40 squares of aluminum foil
- candy thermometer

1. Combine all ingredients in a heavy saucepan.
2. Cook over low heat stirring constantly, until the sugar dissolves.
3. Cover and cook slowly for about 10 more minutes.
4. Uncover and cook without stirring until it reaches 300 degrees on the candy thermometer.
5. Remove from heat and let stand a few minutes.
6. Drizzle strings of syrup on the buttered squares of aluminum foil to form the spider webs.
7. Let webs cool and harden. Remove webs from foil carefully.

LANGUAGE ARTS
SPIDER REPORTING:
1. Read other books on spiders. Are all spiders the same? Do they have the same adaptations? Make a list of how they are the same and different. Can you find out what type of spider Charlotte is?
2. Choose a spider for a report. You may want to answer these sentences:
   The name of this spider is
   This spider lives
   The color of this spider is
   This spider has
   This spider eats
   It catches food by
   This spider can
3. Draw a picture of your spider and label the five body parts.

SPIDER VOCABULARY:
1. Draw a spider web on a large sheet of chart paper. Write the word "spiders" in the center. Ask the children to think of words that may relate to spiders. Each day add to the web as the children learn new words about spiders.

WORD WEB SORTING ACTIVITIES:
1. Each child makes a set of cards from all of the words on the word web. The cards can be kept in small boxes, in an envelope, or a zip lock baggie. (Let children check each others' cards for accuracy)
2. Using the set of cards, the children may do the following sorting activities which reinforce vocabulary and promote higher level thinking:
   a. Find all the words that are spider parts.
   b. Find all the words that are kinds of webs.
   c. Alphabetize the set of cards.
   d. Find all the words that are nouns.
   e. Find all the words that are adjectives.
   f. Find all the words that are verbs.
   g. Find all the one, two, or three syllable words.
   h. Find the five most important spider words and why you chose these.

SPIDER TONGUE TWISTERS:
1. Challenge your students to write and say tongue twisters about spiders. Share the tongue twisters with the class! For example:
   "Wise spiders will weave webs wonderfully well."
   "Spunky spiders of certain species spin in special spaces."
   "Big black widows look best in basic black."
SCIENCE

SPIDER OBSERVATION:
1. A glass jar with small holes in the lid is ideal for this spider observation activity. Put a little soil on the bottom and add a few leaves and twigs. Place a cotton ball soaked with water in the jar. Keep the jar out of the sun. Provide a jar for every four to five students. Write this list on a chart near the observation area:
   a. Use a magnifying glass to observe body parts.
   b. Accurately illustrate your spider.
   c. Watch as the spider makes a web.
   d. Add a live insect. Watch the spider trap and eat its prey.
   e. Keep a daily record of your spiders activity.
   f. Compare your spider to an insect. Chart the similarities and differences.

SPIDER WEB HUNT:
1. Take your students on a spider web hunt. How many different types of spider webs can you find in your surroundings? Can you find a funnel web, orb web, sheet web, and maze web? (See non-fiction reference book) Students can record their observations on an experience chart. They can record with sketches what each web looks like, date of observation, type, and other contents of the web. Encourage continued spider web observing in their homes and have students share their findings (a show-and-tell spider time.)

SOCIAL STUDIES

FEELINGS:
1. People have many feelings about spiders. Discuss how Wilbur first felt about spiders. How do students feel the first time they meet someone new? After Wilbur got to know Charlotte, how did his feelings change? How do we to act towards someone new to us?
2. After discussing feelings, give each child an opportunity to share a real life experience about meeting someone new.
3. In small groups, give each child a card explaining a certain situation in which they are to meet someone new.
4. Each group will role play each situation in front of the class. For example:
   a. This is the first day at a new school.
   b. You've just started playing on a new sports team.
   c. A kid wearing funny glasses sits next to you at lunch.
   d. The teacher has assigned you an activity with a person you do not know.

FINE ARTS

ART: EGG CARTON SPIDERS:

Materials: egg cartons glue
          scissors paint or markers
          scrap paper 12 inch pipe cleaners

1. Cut the egg cartons into six sections, each child receives two egg cups. (This will create a spider with only two body parts)
2. Paint or marker the egg cups and glue on eyes.
3. Using four 12 inch pipe cleaners, poke the pipe cleaners through the sides to form legs.
4. Bend and shape to create the desired shape.
5. Poke a hole through the center of the egg cups and hang with a piece of string!

WEB ART:

Materials: white or black drawing paper glue
          markers or colored chalk

1. The students draw a large web on drawing paper.
2. Trace over the web with a thick line of white glue.
3. Allow the glue to dry two to three days.
4. Use markers or colored chalk to color over the dried glue.
MUSIC:
1. Sing the song, "There Was an Old Lady Who Swallowed a Fly." Have students pick different animal names and sing a new version of the song. Students could also design and make an old lady mobile showing all the animals she swallowed.

SPIDER FACT RAP:
1. Sing the song, "Mary Had a Little Lamb." Using facts that they have learned about spiders, have them create new lyrics to the song. This could be done in cooperative groups or individually. Each group or student would be responsible for writing and teaching the verse to the rest of the class. Add some simple instrument sounds and have fun! For example:
   - Tarantulas are large and slow, large and slow, large and slow
   - Tarantulas are large and slow,
   - What do you know about spiders?

   Most spiders have eight eyes, have eight eyes, have eight eyes
   Most spiders have eight eyes,
   But some have six.

DRAMA:
1. Challenge the students to move like spiders in many different ways. For example:
   - delicately on a web
   - spinning on a web
   - pouncing on an insect
   - ballooning like a spiderling
   - escaping a predator
   - moulting your skin
   - like a tarantula
PHYSICAL EDUCATION

STICKY WEB:
1. Children stand in a large circle with their hands joined and raised above their heads, to make a web.
2. A small group of children (insects) run in and out of the circle while the others sing this tune: (Tune: "London Bridge")
   Spider will catch a bug,
   Catch a bug, catch a bug,
   Spider will catch a bug,
   In its WEB!
3. On the word WEB, the children forming the web will lower their arms.
4. Those children caught inside the circle become part of the web.
5. The game and song continue until all bugs are caught.
6. When all insects are caught, new ones are chosen.

CATCH THE BUG:
1. Students form two parallel lines (A&B) facing each other. The lines should be 20 or more feet away from each other.
2. A ball (insect) is placed in the center of the two lines.
3. Each child in line "A" is given a spider name. Each child in line "B" is also given identical names but in a different order (black widow, tarantula, wolf spider, garden spider).
4. The teacher shouts out one spider name. If "black widow" is called, all students designated as black widows leave their places and race to the center to get the ball (insect).
5. Once the ball (insect) is captured, the object is to bring it back to their line without being tagged by the other team.
6. If successful, a point is earned. If tagged by the other side no points are earned for either team.
7. The game continues until a certain amount of points are earned, depending on the time available.
1. Ask class members to tell you how they feel about spiders. They must choose only one word from the box below. They then tally their responses.

<table>
<thead>
<tr>
<th>I think spiders are...</th>
<th>Scary</th>
<th>Interesting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Dangerous</th>
<th>Helpful</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
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Spiders Graphing

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<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</tbody>
</table>

Scary

Interesting

Dangerous

Helpful
### Spider Body Parts

Label the spider body parts. Use these words:

<table>
<thead>
<tr>
<th>Body Part</th>
</tr>
</thead>
<tbody>
<tr>
<td>abdomen</td>
</tr>
<tr>
<td>leg</td>
</tr>
<tr>
<td>cephalothorax</td>
</tr>
<tr>
<td>pedipalp</td>
</tr>
<tr>
<td>eyes</td>
</tr>
<tr>
<td>spinnerets</td>
</tr>
<tr>
<td>fang</td>
</tr>
<tr>
<td>jaw</td>
</tr>
</tbody>
</table>

**Name**

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![Spider Diagram](image)
BIBLIOGRAPHY

Arkhurst, Joyce Cooper. More Adventures of Spider
Scholastic Inc. 1972
Primary, Intermediate
Folktale
A collection of six West African Folktales about a spider. In these stories there are three themes: cleanliness, hospitality, and good manners. Spider is lazy, greedy, loves to play, and hates to work. But he is funny and lovable too.

Carle, Eric. The Very Busy Spider
Scholastic Books Inc., 1984
Primary
Modern Fantasy
The farm animals try to divert a busy little spider from spinning her web, but she persists and produces a thing of beauty and usefulness. The illustrations can be felt as well as seen!

Chinery, Micheal. Spider
Troll Associates, 1991
Primary, Intermediate
Informational
Full color, life size illustrations. Describes the physical characteristics and the life cycle of the spider.

Craig, Janet. Amazing World of Spiders
Troll Associates, 1990
Primary, Intermediate
Informational
Discusses the characteristics and behavior of different kinds of spiders.
Freschet, Bernice. *The Web in the Grass*
Charles Scribner's Sons, 1972
Primary
Poetry
This book is filled with beautiful illustrations and depicts the friendless, yet beautiful spider.

Goldwin, Augusta. *Spider Silk*
Thomas J. Crowell, 1964
Primary
Informational
This book emphasizes the life cycle of the spider. It portrays a wide variety of spiders and how they use their webs.

Joose, Barbara. *Spiders in the Fruit Cellar*
Alfred A. Knopf, 1983
Contemporary Realistic Fiction
Primary
A young preschool girl is helping her mother with canning fruit. They explore the fear of spiders when they go down into the fruit cellar.

Jukes, Mavis. *Like Jake and Me*
Alfred A. Knopf, 1984
Realistic Fiction
Primary, Intermediate
Alex’s stepfather, Jake, can do just about anything. Alex discovers his stepfather’s one fear, spiders. A book that lends well to choral reading.

Levi, Herbert. *Spiders and Their Kin*
Western Publishing Company, 1968
Intermediate
Informational
A guide to the diverse, yet little known world of spiders and their kin. Full color illustrations and readable text. Describes habits, distribution, and species.

McDermott, Gerald. *Anansi the Spider*
Holt, Rinehart and Winston, 1972
Primary Folktale
This West African folktale of how the moon got in the sky starts with Kwaku Anansi, who sets out on a long and difficult journey. Threatened by Fish and Falcon, he is saved from terrible fate by his sons. But which of his six sons should Anansi reward? Calling upon Nyame, The God of All Things, Anansi's predicament is resolved.

Podendorf, Ilia. *A New True Book Spiders*
Children's Press, 1982
Informational Primary, Intermediate
Actual pictures and simple text introduce spiders and their habits. The book focuses on how they help and harm us, what they eat, and where they live.

Selsam, Millicent E., Hunt, Joyce. *A First Look at Spiders*
Walker and Co., 1983
Informational Primary, Intermediate
Discover identifying and observable characteristics of spiders. The book has detailed drawings which help students distinguish between spiders and insects.
TEACHER RESOURCES:
5. *Charlotte's Web*, available for rent at most video-cassette rental locations.
FROG FACTS

* Frogs lived 230 million years ago, before dinosaurs.

* There are 38,000 different kinds of frogs.

* Frogs are amphibians. Amphibian means "double life."

* Frogs are cold blooded.

* Frogs have two sets of eyelids.

* Frogs also take in oxygen through their thin skin.

* Frogs do not drink water. They absorb it through their skin.

* Some frogs eat rats and mice.

* Tadpoles use gills to breath, adult frogs use lungs.

* Tadpoles are vegetarian; adult frogs eat insects and worms.

* Only male frogs have vocal sacs.

* Frogs that live where it gets cold in the winter hibernate.

* Most frogs can jump ten times their body length.

* The smallest frog measures only one-half inch in length.

* An African frog can be as big as a football.

* People eat frog legs.

* The status of frogs worldwide tells us much about the condition of our planet's ecosystem.
Little Frog's Song (Primary)

Schertle, Alice
Harper Collins Publishers, 1992
Primary
Modern Fantasy

Little Frog lived happily in his pond home. Everyday he swam and played in the water. He sunned his slippery body in the sun. Every evening Little Frog would sing. One day the rains came. It rained so hard that the pond overflowed, and the lily pad that Little Frog was napping on was washed away. When the rain finally stopped and Little Frog woke up, he was far from his pond. In an unfamiliar meadow, he meets and expects to be eaten by three very large creatures, "Can you tell me where my pond is?" asks the frog. Although the creatures, a sheep, a dog, and a boy are kind, they speak a different language. Little Frog is too far from home to sing. Little Frog spends the night in the boy's room. The next morning he is placed in the boy's pocket and the boy begins walking. At last, the boy takes Little Frog out of his pocket and sets him gently on the ground. Little Frog blinks and looks around, there is his pond. When evening comes Little Frog begins to sing, "Home is home, home is home."

Environmental Topics: natural habitat, adaptations

Environmental Concepts:
1. There are different environments, each with characteristics, features and life.
2. Certain plants and animals are found together in communities.
3. Wildlife adapts to its environment in ways that enable it to survive.
4. Both humans and wildlife depend on their habitat.

Discussion Questions:
1. Look at the cover of the book. Can you find any clues about the story?
2. Where did Little Frog live?
3. What were Little Frog's days and nights like?
4. Name the characters in the book.
5. Why didn't the animals and the little boy understand Little Frog?
6. Why didn't the animals eat Little Frog? What does a sheep and a dog eat?
7. Why couldn't Little Frog sing when he was with the animals and the little boy?
8. How did Little Frog feel when the little boy brought him back to his pond? How do you know his feelings?
9. How did it make you feel when Little Frog was taken back to his pond instead of being kept by the boy?
10. When you catch a wild animal or insect, would you keep it or let it go?

INTEGRATING INTO THE CURRICULUM:

MATH
GUESSTIMATION:
1. Create a large green frog out of tag board. Attach a large zip lock baggie or a cellophane pouch on its tummy.
2. Fill the baggie with plastic flies (can be purchased at a novelty store).
3. Have the students guess how many flies the frog ate. The students should write their guesses down on paper. Encourage the students to visit the frog and revise their guesses throughout the week.
4. The flies should be taken out and counted with the class at the end of the week. The guesstimations are read and the winner or winners are announced and rewarded.

FROG COUNTER MATH:
1. Plastic frog counters can be purchased and used for a variety of math activities. These frogs come in four primary colors: green, red, blue, and yellow.
2. Patterning:
   a. Have students work in pairs. One of the pair makes a pattern using the counters. The other student copies this pattern.
   b. Make paper counters, in four colors. Glue the paper counters on a strip of paper in a pattern. The students, using the actual counters copy these patterns and extend them.
3. Graphing:
   a. Each student will receive a cup of counters.
   b. Each student will predict the number of counters and record that number on the worksheet.
   c. Using a worksheet the counters are sorted according to color.
   d. The total number for each color is counted and recorded.
   e. A graphic representation, recording the number of counters for each color is made.
   f. The total number of counters is found and compared to the prediction.
   g. Comparisons, addition, and subtraction problems can be formulated using the above information.

5. Logic:
   a. Various logic problems can be developed using frog counters. One such problem is called Lily Pad Homes.
   b. Freddie, Jeremiah and Kermit all sat on lily pads.
   c. Freddie did not sit on a blue lily pad.
   d. Jeremiah did not sit on a yellow lily pad.
   e. Kermit sits between Freddie and Jeremiah.
   f. On which lily pads do they sit?
      Freddie Frog sits on ____________________.
      Jeremiah Frog sits on ____________________.
      Kermit Frog sits on ____________________.

LANGUAGE ARTS
FROG VOCABULARY:
1. Ask the students to think of words that relate to frogs. Write those words down on frog-shaped pieces of paper and place the frogs on a large lily pad. Each day add more frogs to the lily pad as the students learn new frog words.
2. Use these words for spelling words, vocabulary development, or as a word bank for story writing.

FACT OR FICTION?:
1. Throughout history people have had a love/hate relationship with herpetons. People of ancient Rome thought that if they spit into the mouth of a frog and asked it to take a toothache away, the toothache would go. According to a Burmese legend, eclipses are caused by a frog swallowing the moon. Today, many people believe that if you handle a toad you get warts.
2. Have students make a collection of these "facts or fictions" about frogs and other herpetons.
3. A class book can be made and illustrated using the collection.
4. The book can be shared with other classes.

SCIENCE
WHERE'S THE FROG?:
1. Frogs are both the hunter and the hunted. Being able to blend into their environment is very important to their survival.
2. The common tree frog will readily lighten or darked its color in order to blend with its background. Put a frog in an enclosure with the bottom lined in dark construction paper. Watch it become much darker. Next, put the frog in an enclosure with a light construction paper bottom, see what happens.
3. Divide the class into two teams. Have each member of the team color a paper frog so that it will be difficult to find when placed somewhere in the classroom.
4. One team leaves the room. The remaining team places their frogs in various locations around the room. When the frogs are in place, the others are called in and are given a specified amount of time (5-10 minutes) to locate the camouflaged frogs in the room.
5. When time is up, the teams trade places.
6. The team that has the least number of frogs found is the winner.

FROG OR TOAD?:
1. Have both a frog and toad visit the room. Keep the animals in separate enclosures but in the same learning center. This center should be kept with informational books, a journal for the students to write down their observations when at the center, writing and drawing utensils, and a magnifying glass.
2. Give the students many opportunities to observe the animals. Direct them to discover the differences between the two and share their discoveries with each other. Direct the students to look at color, size, body shape, skin, eyes, and how they move.

METAMORPHOSIS:
1. Bring frog eggs to class and watch them develop.
2. Copy a large frog shape on green construction paper, one per student. Have a separate piece of paper depicting the stages of the development of a frog.
3. The students cut out the frog and cut apart the various pictures. They arrange the pictures in the appropriate order and staple the pictures on the frog's tummy to create a book.

SOCIAL STUDIES
FROG GEOGRAPHY:
1. Frogs are found all over the world, in ponds, and in the desert. Each student chooses a species of frog to research, describe, and illustrate.
2. The students will locate on a world map the country where their frog is found. They will pin a small picture of the frog on that country.

FRIENDS:
1. Read Arnold Lobel's books about the adventures of Frog and Toad.
2. Discuss what makes the friendship between Frog and Toad so special.
3. Sometimes friends need cheering up, they may not feel well or they are sad. Have the students write friendship letters. An example would be Frog is not feeling well so Toad writes him a get-well letter or Toad is sad so Frog writes to cheer him up.

FINE ARTS
BUG CATCHERS:
   Materials: paper frog faces  
   paper party blow outs
1. Cut a hole in the middle of the frog's mouth.
2. Put a party blow out in the hole. Now you have a frog mask with a tongue (the blow out) that the students can use in order to pretend to catch insects.

PHYSICAL EDUCATION
JUMPING ROPE:
1. Have the students learn this jumping rope and counting chant:
   Froggie, froggie turn around,
   Froggie, froggie touch the ground.
   Froggie, froggie jump up high,
   Froggie, froggie catch that fly.
   How many flies did froggie catch? 1, 2, 3, etc.
FROG TAG:
1. Frogs catch only moving things when they eat.
2. Form the students into two lines, twenty feet apart and facing each other. These students are the insects.
3. Select one student to be the frog. The "frog" stands in the center of the two lines.
4. The students chant, "Froggie, froggie time to eat. Froggie, froggie catch your treat." The students in the lines, try to switch to the opposite line.
5. The "frog" tries to catch the students switching lines. When a student is caught, they become a frog and try to catch the other students.
6. The last student remaining in line is the winner.
The story begins in Central America where two little tree frogs, Jumps-a-Little and Hops-a-Bit, become aware that people are coming and burning down their rain forest. A Golden Plover suggests that there is but one creature, the Great Wise Toad, who can help. The great journey begins. Along the way the frogs meet many species and learn about the many problems that plague the rain forest. When all seems bleak and hopeless Hops-a-Bit meets the Great Wise Toad. The Great Wise Toad assures Hops-a-Bit that his little island is safe because there are humans who care about the forest and are doing something to save it.

Environmental Topics: habitats, individual ecosystems, pollution, conservation, deforestation

Environmental Concepts:
1. Loss of habitat is the number one cause of endangerment and extinction.
2. People have the responsibility to conserve and protect natural resources.
3. Living things and the environment are in constant change.

Discussion Questions:
1. On what continent is the Central American rain forest located?
2. What are some unique tropical plants and animal that are found in the rain forest?
3. What ecosystems do the frogs travel through?
4. What is unique about each system?
5. Why would people want to cut down the rain forest?
6. Where do the animals go once their habitat is destroyed?
7. How can people be stopped from burning down the rain forest?
8. Why is glass one of the worst throw-aways?
9. How are the tree frogs adapted to living in the rain forest?
10. If animals could talk, why would they say they don't like people coming into the forest?
11. What is a poacher?
12. How do poachers affect the jungle?
13. Why do you suppose a toad was selected as being the Great Wise Toad?
14. How many people believe that the world belongs to all creatures?

INTEGRATING INTO THE CURRICULUM:

MATH
ESTIMATION:
1. Provide a large map of Central America. Have students estimate and calculate the distance the little tree frogs traveled from Central America to the Amazon rain forest.

RECORD BREAKERS:
1. Many animals hold astounding records as far as their wing spans, length, etc. Have the children go to the library and collect data on various frogs of the world.
2. Each child is to create their own record breaking word problem using the facts from the data they collected. For example:
   
   The sharp-nosed frog holds the world jumping record of fifteen feet in one jump! If the frog jumped seven times, how many feet would it have jumped in all?

3. Have the children share their record breaking problems with the class or with other children. Challenge the children to solve the problems.

LANGUAGE ARTS
PUBLIC RELATIONS LETTER:
1. This activity is to improve people's opinions about frogs and toads by organizing a frog/toad public relations campaign. How often do you hear someone saying something good about frogs and toads? Over the years, they have been given a bad reputation.
2. Begin by discussing the students' reactions to different kinds of frogs and toads. You may find they have a lot of negative feelings about frogs and toads.

3. Divide the students into groups of four or five and assign each group either frog or toad. Tell the students that their challenge is to help change the way people think about frogs and toads.

4. Each group is responsible for writing a letter and making a sign to help convince the people that frogs and toads are special.

5. Have a representative from each group read their letter to the class while the others display the signs.

6. Some examples of signs might be:
   - Go Ahead-Touch A Toad!
     (We Keep Our Warts To Ourselves)
   - Getting Rid Of Insects Is Our Business
   - Frogs Are Alright!

**FROG OR POLLIWOG:**

1. This activity is done to emphasize some of the differences between frogs and polliwogs. Have students go to the library and obtain facts about frogs and polliwogs. For example:

   Frog features: Four legs; webbed hind feet; big eyes on top of head; eats insects; worms; big mouth; sticky tongue; long hind legs; lungs; hops on land.

   Polliwog features: tiny round mouth; no legs; tail; tiny eyes on the side of head; gills; lives entirely in the water.

   Neither features: hairy; covered with feathers; wings; eight legs.

2. Divide the students into two groups, one representing frogs, the other polliwogs. Each child writes a fact they found on a piece of paper. All papers are collected.

3. Tell them you are going to hold up a paper that shows a feature of frogs, polliwogs, or neither.

4. If the correct group claims the feature by raising their hands, they get the card. Otherwise, through group discussion, decide which
group should have the card. Play until all cards have been claimed and the neither cards have been weeded out.

5. Conclude by having each child explain how adaptations affect animals lives.

**SCIENCE**

**FROG OBSERVATION:**

1. Go out in the springtime and collect tadpoles and frog eggs with a net and a large jar. Place the tadpoles in an aquarium with mud, rocks, and plants. Be certain that you use pond water and not water from the tap. The young tadpoles will feed on the algae and small green plants. Clean the aquarium about once a week.

2. As soon as the tadpoles have developed legs, drain all but one inch of water and place a flat rock in the aquarium so the animals can climb out of the water.

3. As they get older they can be fed insects, spiders, slugs, raw meat, and cheese.

4. Have the students observe the following:
   a. the changes of the metamorphosing tadpoles
   b. how a tadpole breathes and compare this to a fish
   c. the flat ears on the sides of the frog’s head
   d. the differences in the rear and the front feet

5. Draw pictures or make models in clay.

6. Let the students imitate the hopping and compose a frog dance.

**EGGS:**

1. Many frogs and toads lay eggs in ponds, streams, or other bodies of water. Many lay eggs in a large mass (bullfrog), in strings (American toad), or individual (red-spotted toad).

2. Discuss with the students that reptile eggs have a leathery texture and amphibian eggs are soft and mushy.

3. In a container filled with water, sprinkle tapioca and label A. In a separate container add a few grapes laid on dirt or sand and label B.

4. Students feel the floating material in A and objects in B. Have them describe some differences between them. Which one do you think represents amphibian eggs and which one represents reptile eggs?
SOCIAL STUDIES
DISAPPEARING FROGS:
1. Many frogs are disappearing. Scientists see fewer and fewer frogs each year in the United States. Frogs live in ponds and other wetland areas. Discuss facts about wetlands.
2. Have the students go to the library and research wetlands.
3. Ask the students to predict why they think frogs are disappearing. Put their predictions on the board.
4. Explain that scientists think polluted water may be poisoning frog eggs and tadpoles. Too little rain in some places dries up the eggs. Other scientists say air pollution is harming frogs.
5. Have students generate ideas and discuss how to solve the problem of the disappearing frogs. What might happen if the wetlands are protected?

FINE ARTS
ORIGAMI JUMPING FROGS:
1. Students can create jumping frogs by folding a 3 x 5" index card according to the direction sheet provided at the end of the unit.

PAPER PLATE PONDS:
Materials: small white paper plates glue
blue tinted cellophane wrap green paint
lima beans colored paper
scissors

1. Give each child enough cellophane wrap to wrap up their paper plate. Add a few spots of glue to fasten the cellophane to the plate.
2. Give each child three or four lima beans. They will paint these green to represent the frogs. Let the beans dry. Add legs and eyes with the colored paper.
3. Their frogs are now ready to be glued into their ponds!
4. Add other decorations to the pond (lily pads, weeds, logs, etc.)

MUSIC:
1. Using the song "Old MacDonald," have the children write their own verses about a frog's life in a pond. There are many different animals that live in a pond and their sounds that can be plugged into the verses.
SPRING SERENADE:
1. This activity demonstrates that each species of frog has a different courtship call, which the males sing to the females to attract them. Divide the children into two groups. Give out sets of calling cards to each group, one per child. The calling cards should say the following:

<table>
<thead>
<tr>
<th>Sound</th>
<th>Animal</th>
</tr>
</thead>
<tbody>
<tr>
<td>quack</td>
<td>wood frog</td>
</tr>
<tr>
<td>peep</td>
<td>spring peeper</td>
</tr>
<tr>
<td>jug-o-rum</td>
<td>bull frog</td>
</tr>
</tbody>
</table>

2. The first group becomes males and forms a circle around the second group, the female frogs, who are given blindfolds.
3. At a signal the males sing their assigned songs. The blindfolded females listen for their assigned sound and move toward it.
4. When they reach a correct singer, they remove their blindfolds. One male may attract more than one female; others may attract none (as it happens in nature).

DRAMA
1. Have students compose the story Journey of the Red-Eyed Tree Frog into a play. Cooperative groups can each write their own version. Provide paper, crayons, markers, and other materials for props.

PHYSICAL EDUCATION
MOVING MEALS:
1. To play this game the children need to be reminded that frogs eat only moving prey. Therefore, they don't notice prey that is still, but are quick to catch moving insects within their reach.
2. One child is appointed frog. The rest of the class are insects.
3. The frog, standing with its back to the insects and about twenty feet from them, counts out "one, two, three, food for me," and turns. Any insects seen moving are "eaten" and sit down.
4. The object or the game is for the insects to reach safety by crossing an imaginary line without being eaten by the frog.
ORIGAMI JUMPING FROG

1. 

2. 

3. 

4. 

5. 

6. 

7. 

8. 

BIBLIOGRAPHY

Berenzy, Alix.  *The Frog Prince*
Henry Holt and Company, 1989
Intermediate
Fantasy
Once upon a time there lived a frog who loved a princess. Though he offered her his love, she rejected him and drove him away. The noble frog sets out to find a more suitable mate. He encounters grave dangers and overcomes great obstacles but never finds a mate.

Chinery, Michael.  *Frog*
Troll Associates, 1991
Intermediate
Informational
This book introduces the reader to the file cycle of the frog. Pictures, as well as full page photographs, helps the reader understand the amazing wonders of a frog's life.

Gibbons, Gail.  *Frogs*
Holiday House, 1993
Primary
Informational
An introduction to frogs, discussing their tadpole beginnings, noises they make, their hibernation, body parts, and how they differ from toads.

Gwynne, Fred.  *Pondlarker*
Simon and Schuster, 1990
Primary, Intermediate
Fairy Tale
Pondlarker, a young frog, is very sad. He is not satisfied at being a frog. Pondlarker seeks a princess's kiss to fulfill his princely ambitions.
Hunt, Joni Phelps. *A Chorus of Frogs*  
Blake Publishing, 1992  
Primary, Intermediate  
Informational  
This book contains numerous photographs depicting all aspects of a frog's life.

Kalan, Robert. *Jump, Frog, Jump!*  
Scholastics, Inc., 1981  
Primary  
Picture  
A highly structured book that tells how a frog avoids being caught.

Kellogg, Steven. *The Mysterious Tadpole*  
The Dial Press, 1977  
Primary  
Modern Fantasy  
Uncle McAllister, from Scotland, sends Louis a birthday gift every year for his nature collection. This year it was a tadpole named Alphonse. Alphonse was not turning into an ordinary frog. Alphonse became too big to keep at home so Louis snuck him into the school's pool. The school's swimming coach and Mrs. Seever, the librarian, found out and helped Louis find a sunken treasure. Alphonse retrieved the treasure. The parking lot next to the school was made into a swimming pool with the money found in the sunken treasure.

Lane, Margaret. *The Frog*  
Dial Press, 1981  
Primary, Intermediate  
Informational  
This book introduces the life cycle of a frog. It details the transformations from a tadpole, mating habits, and the differences of life for them in the twentieth century.
Lionne, Leo. *It's Mine*  
Alfred Knopf, 1986  
Primary  
Fantasy  
Three frogs pass the time of day quibbling over who owns the earth, the air, and the water. A natural disaster makes them realize their foolishness and leads to an understanding of the situation.

Lobel, Arnold. *Frog and Toad are Friends*  
Harper and Row, 1970  
Primary  
Modern Fantasy  
This book is composed of five short adventures that Frog and Toad have. In one adventure, Frog and Toad went walking, upon their return Toad realizes he had lost a button off his jacket. Frog and Toad retrace their steps looking for the button. Many buttons were found, but none was the right one.

Pallotta, Jerry. *The Frog Alphabet Book*  
Charlesbridge, 1990  
Primary  
Picture  
This book introduces the letter of the alphabet by describing a frog or other amphibian for each letter.

Nunes, Susan. *Tiddalick the Frog*  
Primary, Intermediate  
Folktale  
This aboriginal tale tells what happened when the giant frog Tiddalick had such a great thirst. The frog drank up all the fresh water in the world. His animal friends began to suffer. Noyang, the eel, makes Tiddalick laugh and all the earth's water was released.

Snape, Charles and Juliet. *Frog Odyssey*  
Simon and Schuster, 1991  
Primary, Intermediate  
Modern Fantasy  
Albert and the frogs had lived in their pond for as long as they could remember. But when construction and pollution plague the pond,
they are forced to move out. Down dark alleys and underground tunnels, the frogs face many dangers, and obstacles in search for a pond of their own. Albert and his friends find a clean, new home and are very happy.

Wiesner, David. Tuesday
Clarion Books, 1991
Primary, Intermediate
Picture
Frogs rise on their lily pads, float through the air, and explore the nearby houses while their inhabitants sleep.
TURTLES and TORTOISES
TURTLE FACTS

* TURTLES ARE REPTILES.

* TURTLES HAVE BEEN ON EARTH ABOUT 200 MILLION YEARS.

* TURTLES CAN BE FOUND IN ALL BUT THE COLDEST AREAS ON EARTH.

* TURTLES LIVE IN JUNGLES, MOUNTAINS, RIVERS, DESERTS, AND THE SEA.

* THERE ARE MORE THAN 200 DIFFERENT SPECIES OF TURTLES.

* THE SMALLEST TURTLE IS THE SPECKLED TORTOISE. IT WEIGHS LESS THAN ONE-HALF POUND.

* THE LARGEST TURTLE IS THE LEATHERBACK TURTLE. IT CAN WEIGH 1400 POUNDS.

* THERE ARE THREE MAIN GROUPS OF TURTLES: FRESHWATER TURTLES, SEA TURTLES, AND TORTOISES.

* FRESHWATER TURTLES LIVE IN RIVERS OR PONDS. THEY HAVE WEBBED FEET AND FLAT SHELLS.

* SEA TURTLES LIVE IN THE SEA. THEY HAVE POWERFUL FLIPPERS.

* TORTOISES LIVE ON DRY LAND, THEIR SHELLS ARE DOMED-SHAPED AND THEY HAVE THICK, HEAVY LEGS.

* SOME TURTLES LIVE OVER 100 YEARS.

* THE TURTLE'S SHELL IS PART OF ITS SKELETON.

* BOX TURTLE SHELLS ARE SO STRONG THEY CAN SUPPORT 200 TIMES OWN WEIGHT.
* Alligator snapper turtles have long pink ridges on their tongues to attract fish. They stay on the bottom of the pond with their mouth open until a fish appears.

* Turtles have no teeth.

* Turtles bury their eggs in holes on land.

* Many turtle species are becoming endangered due to overhunting, pollution, human destruction of their habitat, and the loss of important food sources.
Imagine what it would be like to be a box turtle for a day. The sun comes up, warming the air. You peak your head out of a rotting birch log where you burrowed to stay warm during the night. The first thing you do is get a drink from the pond. Next, you go to your favorite spot where wild grapes grow. When the sun is high in the sky you stretch out on a rock to bask. The sky clouds over. Before the rains come you head for the shelter of an old apple tree. The rain brings out the worms. Before you can eat them all, a raccoon appears. The raccoon would rather eat you but can not pry open your shell, so it settles for the worms. The raccoon wanders off. The sun is setting, the air grows colder. You burrow yourself into soft pine needles to stay warm.

Environmental Topics: natural habitats.

Environmental Concepts:
1. In any environment, living things have similar needs.
2. Animals need green plants and other animals for food.
3. An animal's habitat is composed of food, water, shelter, and space.
4. A specific predator-prey relationship forms a food chain.

Discussion Question:
1. What kind of a turtle is the story about?
2. Why is a box turtle named a "box turtle"?
3. What kinds of food does a box turtle eat?
4. What would like to eat box turtles?
5. Why is the sun important to the box turtle?
INTEGRATING INTO THE CURRICULUM:

MATH
TORTOISE AND HARE MATH:
1. Read the fable, The Tortoise and the Hare; then create various word problems based on the story. Examples are:
   a. Tortoise travels 2 miles in one hour. How long will it take him to travel 10 miles?
   b. Tortoise walked 6 miles. Hare hopped 10 miles. How many miles did they travel in all?
   c. Hare traveled 21 miles. Tortoise traveled 7 miles. How many more miles did Hare travel than Tortoise?

PATTERNED SHELLS:
Materials: pattern blocks  tortoise outline
           paper pattern blocks
1. Give each student a tortoise outline and pattern blocks.
2. Instruct the students to create various patterns (representing the shell) on the tortoise outline.
3. When the patterns are complete have the students copy the pattern on a ditto of the tortoise using paper pattern blocks.

LANGUAGE ARTS
TURTLE WORDS:
1. Brainstorm with the students "turtle words."
2. Write each word on a small piece of green paper.
3. The paper with the words on them can be glued on a large outline of a turtle to create the shell. As the students learn more about turtles and tortoises, new words can be added.
4. Use the "turtle words" for vocabulary development, spelling words, or writing assignments.

TURTLE POETRY:
1. Introduce various types of poetry. Have the students write their own poetry about turtles on turtle shaped paper.
TURTLE CHALLENGES:
1. Challenge the students to answer various turtle questions.
2. Write these question on a turtle-shaped piece of construction paper.
3. The students answers will be attached to the appropriate turtle to create a mobile.
4. Sample questions are:
   a. See how many animals with a shell you can name, draw them.
   b. How are snails and turtles alike? How are the different?
   c. Use a dictionary or encyclopedia to discover the difference between a turtle and a tortoise.

FRANKLIN:
1. Read the turtle adventures of Franklin Fibs, by Paulette Bourgeois.
2. Encourage the students to create a new adventure for Franklin.
3. Non-writers can draw Franklin, then dictate a story.

SCIENCE
THE FOOLISH TORTOISE:
1. Read the book, Turtle Tails, by Frank Asch.
2. Many people think that a turtle’s shell is something that the turtle can discard whenever it wants to, like hermit crabs do with their shells. A turtle’s shell is part of its skeleton. It can not be removed from its body. Dispel this myth through discussions, by showing the diagram found in Zoobook, and by bringing in a real turtle shell to examine. Contact the local museum or Turtle and Tortoise Club to obtain a shell.

TURTLES, TURTLES, AND MORE TURTLES:
1. Allow the children to appreciate the various types of turtles and tortoises. Contact the local chapter of the Turtle and Tortoise Club to invite a member to be the guest speaker.
2. Ask your guest to bring numerous types of turtles and tortoises. These people are very knowledgeable about turtles. They will have many stories, facts, and slides to share with the class.
3. Have the students brainstorm questions to ask the guest.
ADAPTATION:
1. Turtles and tortoises come with many adaptations that help them to survive in their environments.
2. Have each child or small group choose a turtle or tortoise to study. Have them find where this animal is found, it's size, what it eats, and it's enemies. Have the students determine special adaptations the turtle has that helps it survive, i.e., feet shape, color, long necks, etc.
3. These reports should be shared with the whole class.

SOCIAL STUDIES
FABLES CHARADES:
1. Discuss why fables are written (to teach people lessons).
2. Divide the class into groups and give each group a fable to read and to determine what lesson was being taught.
3. The groups then act out their 'lessons' while the rest of the class tries to determine what it is.
4. Be sure to read the fables to the class.

ART
TURTLE ON A STRING:
Materials: 2 paper plates 6 egg carton cups
25 inches of string tempera paint
construction paper scraps

1. Cut legs and tail from scrap paper and glue on edge of the paper plate on the inside.
2. Glue the second paper plate over the top of the first.
3. The head is a 2 x 6" paper strip. Fold it in half and draw on eyes and a mouth. Glue it on to the plate.
4. Glue the egg carton cups on to the top of the plate to make the turtle's shell.
5. Paint the turtle.
6. Punch a hole in the plate under the turtle's chin and add a pull string.
STAMPED TURTLES:
Materials: large styrofoam meat trays  pencils  tempeta paint  art paper

1. Cut the sides from the meat tray. Use a permanent marker to draw the outline of a turtle. Then draw additional details such as eyes and shells.
2. Using a pencil with a dull blunt lead, trace over each of the lines on the tray.
3. Very gently press the turtle design until it detaches from the surrounding foam.
4. Paint the surface of the turtle and press it onto art paper.

DRAMA
THE TORTOISE AND THE HARE:
Materials: tortoise and hare pattern  crayons  craft stick  scissors  glue

1. Make tortoise and hare puppets using a pattern that is colored, cut out and glued to a craft stick.
2. Using these puppets, have the students take turns acting out the fable, The Tortoise and The Hare.

COOKING
CHOCOLATE MARSHMALLO# TURTLES:
Materials: 2 cups semi-sweet chocolate chips  2 tablespoons shortening  12 marshmallows  1 1/2 cups pecan halves

1. Melt the chocolate chips and shortening, remove from heat and cool the mixture to 85 degrees.
2. Cut the marshmallows in half horizontally: place on wax paper and flatten slightly. Set aside.
3. On a wax papered covered tray, form the head and hind feet of the turtle by arranging three pecan halves with ends touching in the center. For the front feet, place one pecan quarter on each side of the head.
4. Spoon 1/2 teaspoon of the melted mixture into the center of the pecan cluster.
5. Make the turtle shell by dipping the marshmallow halves into the melted chocolate mixture. Place each dipped marshmallow over the pecan clusters. Press down slightly and top with a pecan half.

PHYSICAL EDUCATION
TORTOISE AND HARE:
1. Have the students form a circle all facing clockwise.
2. The teacher chooses a child to be "It". When "It" calls "TORTOISE," the whole circle of students move as slowly as possible clockwise. When "It" calls "HARE," the circle races quickly around the counterclockwise.
Long ago, an old man and his grandson stood beside a large rock overlooking a river. There, the old man said, he would carve a turtle out of the rock. The turtle would become the eyes of Manitou and watch over the Delaware people. For many years the turtle did watch over the river and its people. But gradually, fewer visitors came to see it and harsh weather eroded its lines. Strangers came and chopped down the forest, the white river water turned brown, and the stars were dimmed by bright lights on the ground. One day a can of paint was sprayed over the turtle and it could no longer see. Then, a man who knew about the old ways of the Delaware saw the rock. He brought workmen, removed the paint, and placed the turtle where it stays, to this day, in the botanical garden of New York City.

Environmental topics: natural habitat, built environment, integrated waste management

Environmental concepts:
1. Living things are interdependent with their natural and physical environment.
2. People's social behavior is basic to maintaining, altering, or destroying the environment.
3. People interact mentally and emotionally to the objects and events in their environment.

Discussion Questions:
1. Why did the old man carve the turtle in the rock?
2. What was Manitou supposed to do for the people?
3. What season was the turtle happiest? Why?
4. As time passed by what was happening to the turtle?
5. What did the strangers do that turtle did not understand?
6. Why did the little turtle grow sad?
7. One day turtle heard the sounds of boys and became excited. Then he heard a hiss. What made the hissing sound?
8. Why couldn't turtle see anymore?
9. How was the turtle rescued?
10. The turtle no longer watches the river. Where can you find the turtle today?
11. Name some things that people have done in the story that have hurt the earth?
12. In what ways did the man in at the end of the story help the earth?
13. What are some ways you can care for the environment?

INTEGRATING INTO THE CURRICULUM:

MATH
TURTLE GRAPHING:
1. The students will research different turtle species and collect information on weight, size, and longevity.
2. Have the students bring the information to class and graph the results.

LANGUAGE ARTS
TURTLE KING:
1. As an entire class discuss compound words. Ask the students for some examples and put them on the board.
2. Tell the students they are about to play a compound word game called "Turtle King."
3. Choose one child to be the score keeper. This child becomes the Turtle King (or Queen).
4. Each team of two to four players has an envelope of blank fish parts. (Many turtles eat fish so this would be appropriate.) Each fish contains a body and a tail. (See activity sheet provided)
5. Each team tries to make up a compound word. They write one part of the word on the body and the other on the tail. The finished fish is delivered to the Turtle King and the team receives a point for every correct answer.
6. The teacher can set any time limit desired.

TURTLE TOPICS:
1. Have the students research the many interesting facts they find about turtles.
2. Each student will come up to the board and write one turtle fact they found. For larger classes, students can come up to the board in groups of four or five.
3. The class will acquire many facts about turtles. The students will complete the turtle topics activity sheet provided.
4. The students will put one turtle fact in each part of the turtle's shell. They then may add color and decorations to their turtle.
5. Display the turtles on a bulletin board.

**SCIENCE**

**ALIKE OR DIFFERENT:**
1. Ask the students to name as many animals as they can that have shells. Write down their responses on the board.
2. One of their responses should have been a snail. If they did not respond snail, remind them that snails have shells.
3. Observe a snail and a turtle. Have the students list three ways turtles and snails are alike and different. Have them list how they are like turtles and snails.
4. Have the students cut out pictures of animals with shells and glue them to cards. If pictures can not be found have students draw the animals.
5. The students can now play an animal riddle game. A child selects a picture and describes the animal chosen.
6. Classmates attempt to guess the animal. If no one is correct after five guesses, the child shows the picture and selects someone to take their place. If someone guesses correctly, that person comes up and selects a picture.

**SOCIAL STUDIES**

**POLLUTION INVESTIGATORS:**
1. Discuss with children that environmental pollution affects all forms of life. Animals are exposed to litter that can cause illness, injury, and death. Fishing line may get tangled on the legs, wings, and beaks of birds causing them harm or even death. Half-opened cans can cut the animal's tongue. Sometimes smaller animals get their heads stuck inside such cans and they can't eat. Fish or birds get into the loop portions of plastic six-pack can holders. The animal continues to grow, but the loop won't stretch. A slow death results. Cellophane wrappers and clear plastic bags cause many sea turtles to
choke. They think the plastic is a jellyfish and swallow it, causing death.
2. Divide the class into teams of four or five students.
3. Ask each team to collect litter they have found in the environment. Each team will then make a collage with the litter they have collected.
4. Have a group discussion on the effects of litter. Have the group rate their litter from most harmful to the least harmful.
5. Have the students answer the following questions:
   a. How can people eliminate litter?
   b. Can manufacturers make cans with openings other than pop tops?
   c. What can people who fish do to help remove lost fishing line?
   d. What can you do personally to help the pollution problem?
   e. What can your family do to reduce litter?
   f. List eight ways litter can harm wildlife.

FINE ARTS

COOKING: TURTLE DELIGHT:
Materials: green food coloring whole cloves pecan halves green grapes canned pear halves in natural juice

1. Pour the pears and juice into a bowl. Add several drops of green food coloring.
2. Soak the pears until they are green.
3. Lay each pear half on a plate, hollow side down. Use four pecan halves on each pear to make the turtle legs.
4. Use a green grape for the head and two cloves for the eyes. Remove the cloves before eating the grapes.
5. Your students will enjoy this refreshing treat!

TURTLE ON A STRING:
Materials: 2 paper plates (size is optional) paper scraps 6 egg carton cups glue 25 inches of string or yarn scissors crayons hole punch
1. Each child will create their own turtle that can be pulled around on the ground like a pet.
2. Cut legs and tail from construction paper scraps. Glue to the edge of one paper plate.
3. Place the other paper plate on top and glue together. You now have the turtle's body.
4. The head is a 2 x 6" paper strip. Fold in half, draw eyes and mouth with crayons. Glue head to plate.
5. Take the egg carton cups and individually trim the edges so each cup is even. Glue the egg carton cups upside down onto the turtles body to create a bumpy shell.
6. Paint him with tempera or crayons. Punch a hole in the front of the paper plates and add a pull string. He will follow you anywhere!

PHYSICAL EDUCATION
THE RACE IS ON:
1. Read the story, The Tortoise and the Hare.
2. Go outside and divide the class into two groups, the tortoises and the hares.
3. The students will be running a race against each other. The tortoise group can only walk through the race. The hare group can run.
4. The exception is the hare group will have to run through an obstacle course and the tortoises can walk down a clear path!
TURTLE KING (COMPOUND WORDS)
Asch, Frank. *Turtle Tales*  
The Dial Press, 1980  
Primary  
Picture  
One day Turtle was on his way to the pond when an apple fell on his head. It hurt so much that turtle decided to pull his head in. He continued on his way to the pond. Along the way he bumped into many things. When he reached the pond, he found that he could not drink or eat with his head inside his shell. That night Turtle cried himself to sleep. The next morning Turtle decided that a wise turtle would keep his head out. He was able to eat and drink. However, when a fox decided to have Turtle for dinner, Turtle made up his mind that a wise turtle would keep his head out some of the time and in some of the time.

Bourgeois, Paulette. *Franklin Fibs*  
Scholastic Inc., 1991  
Primary  
Modern Fantasy  
This is one of a series of books about a young turtle named Franklin. Franklin brags to his friends that he can swallow seventy-six flies in the blink of an eye. Now his friends want to see Franklin do it. In the end Franklin tells the truth and still keeps his friend’s admiration.

Bronson, Wilfred S. *Turtles*  
Harcourt, Brace and World, Inc., 1945  
Primary  
Informational  
This is an older book, but still contains good general information on turtles. The text is simple for primary students to read themselves.
Bruchac, Joseph, London, Jonathan. *Thirteen Moons on Turtle's Back*
Philomel Books, 1992
Intermediate
Poetry
In many Native American cultures each of the thirteen moons of the year is said to hold its own story, in each is powered by the turtle who is believed to contain the mystery of the moon in the shell of its back. The book celebrates the seasons of the year through poems from the legends of such Native American tribes as the Cherokee, Cree, and Sioux.

Bryan, Ashley. *Turtle Knows Your Names*
Intermediate
Folktale
A small boy with a long name is challenged by his grandmother to find out her real name. It was turtle who knew the name.

Freeman, Don. *The Turtle and The Dove*
The Viking Press, 1964
Primary
Modern Fantasy
A very tired dove was flying across the sea looking for a place to rest when she spotted a very tiny island. The island turned out to be a turtle and a friendship was struck up. When a storm developed turtle and dove were forced to go their own ways. Turtle and dove renewed their friendship after they both have families.

Okawa, Essei. *The Fisherman and the Grateful Turtle*
Heian International Inc., 1985
Intermediate
Folktale
This is one of the oldest folk tales in existence; it is believed to be 1200 years old. A poor Japanese fisherman, named Urushima Toro, rescues a turtle from some cruel children on his way home from the sea. Urushima Toro releases the turtle back into the sea. A sea princess appears and tells him the sea king wants to thank him. He eats the finest foods and stays at the sea palace for three years. As time passes Urushimo misses his simple life and asks to leave the palace. He is given a red box that he should never open. When he
returns to the village he finds that he was gone 300 years! He opens
the box and he instantly turns old.

Souza, D.M.  What's Under That Shell?
Carolrhoda Books Inc., 1992
Intermediate
Informational
This book provides fascinating facts about the members of the turtle
family. It examines the life cycle, characteristics, and habitat of the
turtle.

The Cousteau Society.  Turtles
Simon and Schuster, 1991
Primary
Informational
This book describes the physical characteristics, behavior and life
cycle of the green turtle. It also discusses how the green turtle
populations are threatened by fishing, pollution, poaching, and
habitat loss. The large photographs provide wonderful viewing.

Troughton, Joanna.  Tortoise's Dream
Blackie and Son Limited, 1980
Primary, Intermediate
Folktale
This story is about origins. The story reveals how the Banter people
of Africa explain the beginning of the world. A tortoise's dream of a
fabulous fruit tree sends a series of animals to consult grandmother
Koko about its location. Each animal, forgetting the name of the tree,
could not reap the tree's fruit. Tortoise, slow and steady remembers
and shares the fruit with all his friends.
CHICKEN FACTS

* Bird eggs come in a wide variety of colors, from the white of a chicken's egg to almost solid black of some ducks.

* The number of eggs a bird lays and incubates is called a clutch.

* Hens may lay up to 350 eggs a year.

* The parts of the egg include the yolk, the egg white, the membrane, the air space, chalaza, shell, and egg spot. The shell provides protection and is permeable to air and moisture. The membrane allows air and water to pass through to the embryo. The yolk provides fatty food for the chick and the egg white provides the protein.

* Eggs can be checked for freshness by candling: holding the egg up to a strong light source.

* Eggs hatch in about twenty-one days.

* Eggs provide good sources of proteins, iron, and phosphorus.

* A female chicken is called a hen and a male is called a rooster.

* The rooster has a growth of flesh on the top of his head called a comb and two pieces of red flesh hanging below the beak called a wattle.

* Eggs are collected twice a day by the farmer and kept cool until sold to stores and restaurants.

* Eggs are used to prepare vaccines, animal feeds, and fertilizers. Also, they are used in producing ink, varnishes, soap, shampoos, paints, and printer's ink.
THE BROODY HEN (PRIMARY)

Dunrea, Olivier
Doubleday Books, 1992
Primary
Modern Fiction

Hen tries to lay a clutch of eggs in various locations throughout the farm. She tries laying her eggs in the pig's feed trough, on the roof of the dovecote, in the hayrack of the barn, on a shelf in the farmer's bathroom, and finally on top of the farmer's hat. Where ever she lays the eggs they roll away and break. The farmer finally grabs her and puts her in the broody pen where she lays her clutch of eggs.

Environmental Topics: agriculture

Environmental Concepts:
1. Proper care of pets and domestic animals and behaviors affecting the welfare of wildlife involve personal responsibility and social policy.
2. All livestock and pet animals were domesticated and developed from wildlife species as humans sought to provide themselves with food, shelter, medicines, and companionship and to satisfy wants and needs.
3. We can raise and keep some kinds of animals for use and enjoyment by providing the necessary conditions and care.

Discussion Questions:
1. Where does the hen try to lay her eggs?
2. What happens each time?
3. What do her eggs look like, are they all white?
4. What do her chicks look like?
5. What is a broody pen?
6. Is the hen proud of her chicks? How do you know?
7. What kind of animals do you find on a farm?
8. How are these animals different from wild animals?
9. Why are animals raised on farms?
INTEGRATING INTO THE CURRICULUM:

MATH

EGG COUNTING:
1. Using real eggs or representations in an egg carton help students do various math exercises. For example:
   a. If you made egg salad using 6 eggs and scrambled eggs using 3 eggs, how many total eggs would you use? How many eggs would be left in the carton?
   b. A class has 24 eggs. They found only 18 eggs. How many eggs are still hidden? They hid 18 eggs the second time. How many were still hidden?
   c. If you have a dozen hard boiled eggs, you share 4 with your friend, your sister eats 1 and you eat 3, how many eggs do you have left?
   d. If you need 3 eggs to bake cookies, 4 eggs to make egg salad for lunch and 2 eggs to bake a cake, how many eggs would you need? How many eggs would you need to bake 2 cakes? For 4 cakes?
   e. You cooked 2 dozen fried eggs, and 6 slid off the platter! How many eggs could still be eaten?
2. Have the students develop other egg math problems to share with the class.

EGG SORTING:
1. Hen eggs come in different sizes and are either brown or white.
2. Make some brown and white cardboard eggs in three sizes: small, medium, and large.
3. Working in small groups allow the students to sort the eggs according to size and color.

EGG PATTERNING:
Materials: ditto with three sizes of eggs on it (four each)
3 x 18” strip of construction paper (headband)
1. Students will cut apart the eggs.
2. Students will glue the eggs onto the strip of paper in an ABC pattern.
3. The completed strip of paper will then be stapled into a headband.
EGG WEIGHT:
1. Determine how much various eggs weigh. Using arbitrary units of weight (unifix cubes, marbles, paper clips, etc.) students will discover the weight of their eggs.
2. These weights may be compared with the rest of the class by graphing on a continuum.
3. The students can easily determine the heaviest and the lightest weighing eggs.

LANGUAGE ARTS
ROSIE'S WALK:
1. The students can create their own book of Rosie's Walk by Pat Hutchins. This is a good book to reinforce prepositions for the kindergartners. The simple text makes it a good beginning reader for first graders. The book can be constructed as follows:
2. Have the students color and cut out a picture of a hen, this should be done on heavy paper like construction paper or cardstock. The hen is attached to the book by a piece of yarn. The text is printed, one page per line, so that it may be cut apart easily. The text may also be printed on sentence strips for the class to copy onto the various pages.
   a. The title page should have the book name and the author. The words "Rosie the hen went for a walk." will be placed on the bottom of the page. The puppet hen needs to be attached with yarn to this page.
   b. Page 2 reads, "across the yard." This page is drawn with a barnyard scene.
   c. Page 3 reads, "around the pond." Blue cellophane can be glued to create a pond. Plants and trees can be drawn around the pond.
   d. Page 4 reads, "over the haystack." Straw is glued onto this page.
   e. Page 5 reads, "past the mill." The mill is cut out of construction paper and the arms of the mill are made with tongue depressor sticks.
   f. Page 6 reads, "through the fence." The fence is made of strips of brown construction paper. A slit is made in the fence large enough for Rosie to slip through.
   g. Page 7 reads, "under the beehives." The beehives are made of styrofoam meat trays cut in a dome-shape. Place several
bees around the hive. Bees can be made by making a fingerprint for the body, then adding wings cut from cellophane.

h. Page 8 reads, "and got back in time for dinner." Again the students create a barnyard scene, only this time they glue chicken feed on the page.

3. As the students read this book the puppet Rosie is moved through each page according to the text.

SOCIAL STUDIES
EGGS AROUND THE WORLD:
1. The students will learn of holidays and customs around the world using eggs.
2. Ukrainian/Pysanky Eggs: In Eastern Europe, Polish, Slavic, and Ukrainian people make fancy designs on eggs. These eggs are then taken to church where they are blessed. They are kept in the home for good luck.
3. Have the students make Pysanky eggs.
   Materials: hard boiled eggs crayons dye hair blower
   a. The students will draw a design on the egg using a crayon, then dip it in the dye. Let the dye dry.
   b. Repeat this process using a darker dye each time. The last dipping, black dye is used.
   c. When finished, the eggs are warmed by a hair dryer to melt the wax. When the wax is melted wipe it off with a cloth.
4. Germany: Empty eggshells are decorated and hung on a small branch. Just before Easter, these egg trees are taken from door to door for good luck.
   a. Empty an eggshell by making a small hole in the small end of a raw egg and a larger hole in the large end. Stick a needle into the yolk to break it. Shake the egg large end down over a bowl until the contents come out. Rinse the shell out with water and let it dry.
   b. Have the students decorate the shells using various materials such as: lace, sequins, ribbons, and markers.
   c. Using string, ribbon or pipe cleaners hang the decorated eggshells from a branch.
5. Discuss egg customs in other countries such as Mexican Cascarons, Russian Faberage eggs, or Oriental eggs.
6. Have the class create their own version of these eggs.
7. Be sure to locate on a map the countries that you are discussing.

SCIENCE

INCUBATION:
1. Incubate eggs in the classroom. It takes chicken eggs 21 days to hatch.
2. Buy or make a chart that show chicken embryo development.
3. Discuss several times per week what is happening inside the egg.
4. A worksheet that shows the development can be used for a sequencing activity.

EGG MAGIC:
1. Egg shells are composed of calcium carbonate a base. When the eggshell is placed in vinegar, an acid, there is a reaction. Carbon dioxide gas is formed. The bubbles appear on the shell and rise to the surface. Thirty-six to forty-eight hours later the entire shell has dissolved, exposing the shell membrane which holds the soft insides of the egg. If the egg is placed in water, the water will move through the shell membrane by osmosis. The egg will swell with water until it breaks.
2. Eggs can be made to float in water. Give each student an egg and a cup of water. Have the students lower the eggs into the water. If the eggs sinks to the bottom of the glass, ask the students why. They will sink because the egg is heavier than water. Invite the students to add salt to the water. Eventually enough salt will be added to the water so that the water become heavier than the egg. When this happen the egg will float.
3. Ask the students to try to crush a raw egg between their hands by pressing on the large and small ends, be sure there are no cracks in the shell. They’ll find that it is impossible to do. The curvature of the egg distributes pressure evenly over the shell instead of at any one point.
4. To see just how strong an eggshell is, carefully break open two eggs so that there are four equal halves. Empty the contents. Place a book on the shells. Place more books on the shell to see how many can be held. The egg shape was borrowed by architects because the shaped provided space and did not require supporting walls and
pillars. This special structure can be found in churches, baseball stadiums, and planetariums. Have the students look in books and magazines for buildings with roofs shaped like a dome.

5. Get an egg inside a bottle. Peel a hard boiled egg. Place it in the opening of a bottle, it will not go in the bottle. Next, place paper in the bottom of the bottle and light it on fire. The egg will slip in. Blow into the bottle to get the egg out.

6. The students can determine if an egg is hard boiled or raw just by spinning it. A hard boiled egg will spin because it is solid inside. A raw egg will not spin because its insides are liquid.

FINE ARTS
EGGSHELL MOSAICS:
1. Collect cleaned eggshells.
2. When enough has been collected for an art project, crush them, then dye them various colors.
3. Have the students draw a simple picture on paper with a pencil.
4. The colored eggshell are glued to the surface of the picture to fill it in.

OUTER-SPACE EGGS:
1. Crack an egg in two. Use the larger of the two halves to make a creature.
2. Cut a cardboard base into the shape of feet. Glue the open end of the egg to the base (feet) and let it dry.
3. Using a variety of materials: marker, pipe cleaners, yarn, paper, create an outer-space egg creature.
4. Have the students name their creatures and write an adventure for them.
5. Display the creatures and the stories around the room. Invite families or other classes to come and enjoy the creation.

DRAMA
1. Read the book Henny Penny by Paul Galdon.
2. Have the students create puppets of each of the characters in the book.
3. Act out the story. Do it many times so each child gets to participate.
4. Take the show on the road and visit other classes.
COOKING

CLASS COOKBOOK:
1. Have the students bring in egg recipes.
2. These can be put together to make a class egg cookbook.

EGGS FOR LUNCH:
1. Each student will follow a recipe in order to make their own lunch.
2. Write the recipe for egg salad on signs.
3. Place these signs at different stations around the room.
4. The students begin at station 1 and proceed to the following station in numeric order until a sandwich is made. For example:
   a. Crack and peel egg, place in a bowl.
   b. Use a fork to smash the egg.
   c. Add 2 teaspoons of mayonnaise to the smashed egg and stir.
   d. Add a pinch of salt and a pinch of pepper. Stir some more.
   e. Spread the egg mixture on a piece of bread. Put another piece of bread on to. EAT!!

EGGS ON THE SIDEWALK:
1. Ask the students if they ever heard of the saying, "It's hot enough to fry eggs on the sidewalk?"
2. Discuss its meaning.
3. Ask the students if they think eggs can really be fried on sidewalks.
4. If the weather is hot enough try it.
   Materials:
   a. Place the foil on the sidewalk in the direct sun.
   b. Grease the foil with the margarine.
   c. Break the egg on to the foil.
   d. Wait for it to cook.
   e. Egg whites begin to cook at 145 degrees, egg yolks at a slightly lower temperature.
PHYSICAL EDUCATION

BEAN BAGS:
1. Make egg-shaped bean bags out of felt, decorate one side using fabric paint.
2. Gross motor skills can be developed by having the students toss the bean bags into the air and catching them again. Have them try to throw it higher. Increase the difficulty by having the students do various things before they catch it: clap, turn around, or touch the ground, etc.
3. Instruct the students to place the bean bags on their heads and to balance it while they perform various activities such as walking on their tip toes, walking crouched down. Remind the students that if the bean bags drop to the ground they will break.
On a farm near a river two hens lived, Hetty and Harriet. Harriet was not happy being a young chicken on the farm. She knew there must be a better place just over the field. One night a terrible storm left a fallen tree, making a bridge across the pond. Harriet convinced Hetty to go with her to find the perfect place. The two hens make their way across the land encountering many unperfect places. The two hens were so curious that they wandered into an egg production plant. Hetty and Harriet didn’t make their daily quota of eggs and were sent to Fowlfare, makers of chicken pies and soup. The two hens managed to escape, bringing all the other hens with them. They all traveled back and end up back at the farm. Hetty and Harriet both agree that this is the perfect place.

Environmental topics: natural habitat, built environment, food chain, agriculture

Environmental Concepts:
1. All living things are affected by their environment.
2. A food chain is formed by a specific predator-prey relationship.
3. Habitat is composed of food, water, shelter, and space.

Discussion Questions:
1. Why was being the youngest hard for the Hetty and Harriet?
2. Why did Harriet want to leave the farm?
3. How did the storm allow the chickens to leave the farm?
4. Every time the chickens came to a new spot Harriet would say it was the perfect spot. What changed her mind?
5. How did the chickens adapt to city life?
6. How are the habits of chickens not compatible with the city environment.
7. When Harriet stood outside the egg production plant what things made her think it was the perfect place?
8. Do you think the chickens knew what would happen to them if they didn’t lay enough eggs?
9. Why did they go back to save the other chickens when they were escaping?
10. How was the appropriate food and shelter provided at each location?
11. At the end of the story what predators were after the chickens?
12. What predator-prey relationships and food chains were shown?

INTERGRATING INTO THE CURRICULUM:

MATH

EGG COUNTING:
1. For this math activity use real eggs in a carton or empty cartons with dry beans to help the students complete these math exercises.
2. The students will complete these math problems using the following operations: addition, subtraction, multiplication, division.
   a. If you made egg salad using six eggs and scrambled eggs using three eggs, how many total eggs would you use? (9)
   b. How many eggs would be left in the carton? (3)
   c. If you need three eggs to bake a pie and four eggs to bake a cake, how many total eggs do you need? (7)
   d. For two pies? (6)
   e. For three cakes (12)
   f. A class hid twenty-four Easter eggs. They found only eighteen eggs. How many were still hidden? (6)
   g. They hid eighteen eggs again and this time found twenty one! How many more did they find the second time? (3)
   h. How many more were still hidden? (3)
   i. If you have one dozen hard-cooked eggs and share five with a friend, then your brother eats one, and you eat two, how many do you have left? (4)

Fractions:
   a. If your class made a cake using six eggs, what fraction of the carton would be left? (1/2)
   b. Your family cooked two dozen fried eggs. Six slid off the plate! How many eggs could still be eaten? (18)
   c. What fraction of eggs slid off the plate? (1/4)
   d. What fraction is still on the plate? (3/4)
3. Have students develop their other egg math problems for each other to solve.

MEASUREMENT: MAKE -IT-YOUR-WAY EGG SALAD:

Materials:
cup dressing (Choose one: mayonnaise, salad dressing, sour cream, plain yogurt)
teaspoon herb or spice (Choose one: chopped chives, dill weed, dry mustard, crushed oregano leaves)
teaspoon salt (this is optional)
hard-cooked eggs, chopped
cup chopped vegetables or fruit (Choose one: apples, broccoli, celery, pineapple, celery stalks, lettuce leaves, bread, or crackers)

1. Show the students sets of dry and liquid measuring cups and spoons. Discuss the need for cleanliness and accurate measuring.
2. Have students wash their hands. Measure dressing into cup. Use rubber scraper to scoop dressing into the bowl. Measure herb and salt (if desired). Put into bowl with dressing. Stir ingredients with spoon until well mixed. Stir in eggs and vegetable or fruit until coated with dressing. With spoon, scoop or spread egg salad onto celery stalks, lettuce leaves, bread, or crackers. Cover extra salad and store in refrigerator. Eat and enjoy!
3. Make the recipe with variations. Ask the students: What will the egg salad taste like if amounts of some ingredients are changed?
4. Have students brainstorm different recipe ingredients to try.
5. Have students bring in favorite family egg recipes. Compile the recipes into an egg-shaped class recipe book. Have students copy the recipes and decorate the books.

LANGUAGE ARTS
INCUBATION/FERTILITY:

1. The following activities will be done as your class observes chickens being hatched in an incubator. Incubators can be purchased from school supply catalogs. The styrofoam incubators for thirty dollars or so, are fine, and the more expensive ones will also do a good job.
2. Background Information: Chicken eggs take twenty-one days to hatch. The embryo begins to develop inside the egg shortly after the
egg is placed in the incubator with the proper temperature of 100 degrees. (The temperature will vary from 99 degrees to about 101 degree, and this is satisfactory) The incubator must have a pan of water and/or wet sponges to provide humidity, which is essential to prevent the embryos from sticking to the shell inside the egg. The mother hen has special glands which provide moisture for the embryos. Fertile eggs can be found in most communities: chicken farms, feed stores, some pet stores, and biological supply houses.

3. Teaching Tips: Begin the incubation of the chicken eggs on a mid-week day. Never start on a Monday because the chicks will hatch three weeks later on a Sunday. Put a few eggs in the incubator at a time. This increases the chances that some of the eggs will hatch during the school day. Use a dozen eggs to assure that some eggs will hatch. The eggs should be rotated, or turned over, four or more times a day, except the first and last day when it is best not to disturb them. This rotation of the eggs prevents the embryo from sticking to the side of the shell. Occasional lapses are okay.

4. Begin activity:
   a. Explain to the students that a baby bird grows inside an egg until it is ready to hatch. It must have warmth, protection, and moisture in order to grow. The incubator provides these things instead of the mother. The egg will stay in the incubator for twenty-one days before it hatches. The temperature in the incubator should be 100 degrees.
   b. Before you put the eggs in the incubator, hold the eggs in front of a filmstrip projector or a flashlight so the students can see that the egg is clear except for where the yolk is.
   c. This investigative section can be done individually or in groups. Hold a store bought egg in front of a flashlight. What can you see inside the egg?
   d. The darker oval is the yolk. Can you see it?
   e. Use scissors to gently tap the shell. Peel away small pieces of shell. Can you see the white, thin membrane?
   f. Why do you think the membrane is there?
   g. Open the egg into a cup. Try not to break the yolk. What do you think the yolk and the egg white do for the chick?
   h. Students should list words which describe the yolk, egg white, shell, membrane, and their functions.
ONCE UPON AN EGG:
1. Read stories and fairy tales to the class. Point out story elements, characters, setting, problems, solutions, endings. Have students create new stories changing existing elements.
2. Use some of these popular story starters:
   a. Pinnochegg
   b. Snow White and the Seven Eggs
   c. Cindereggla and the Fairy Egg Mother
   d. Little Red Riding Egg
   e. Hanselegg and Gretelegg

SCIENCE
BIRD LAB- CHICKEN EGG:
1. This activity can be done individually or in small groups. The group will crack an egg in a dish without breaking the yolk. The students will observe the parts of the egg.
2. Discuss the function of each egg part with the students.
   shell- protection, permeable to air and moisture
   membrane- keeps liquid from oozing out of shell
   yolk- fatty food for chick
   egg white- protein food for chick
   air space- provides air for chick
   chalaza- "twisted chord" keeping yolk centered in egg
   egg spot- (germial spot) where formation of the chick begins
3. The students will label and define the parts of the egg using the activity sheet provided.

KEEPING RECORDS:
1. Explain to the students that when a baby chick starts to grow inside the egg, it is called an embryo. When an embryo begins to grow, it is no bigger than a broken pencil point. It grows and changes until it almost fills the egg twenty one days later.
2. Have students in groups or individually, hold up an egg in front of a flashlight or film projector. This method is called candling. Farmers used to "candle" their eggs by holding them up to a candle to see if the embryos were developing. (Be very careful not to damage the developing chick)
3. Look at the egg. You should see the outline of an embryo and the dark red blood vessels. Gently roll the egg. Sometimes you will see the embryo kick.

4. Using the sheet provided, the students will keep a chart after candling their eggs, and sketch the inside of the egg at each candling.
SOCIAL STUDIES
EGGS AROUND THE WORLD:
1. Centuries ago, the Chinese gave each other red-dyed eggs in the spring. Red is a favorite color in China. Both the egg and the color are symbols of life.
2. Help the students locate China on a map or globe and mark with an egg-shaped note.
3. Have students make bright red eggs using food coloring, egg dye, or softer red dye using natural coloring:
   a. Place eggs in a pan and cover with either fresh sliced beets, cranberries, radishes, or frozen raspberries.
   b. Add enough water to cover (plus one tablespoon vinegar per cup).
   c. Bring to a boil. Lower heat to a simmer and set timer for twenty minutes.
   d. Use a slotted spoon to remove eggs. Let eggs dry.
   e. Students can decorate and give to their friends.
   g. Have students research other countries and their egg customs. (Eastern Europe, Polish, German, Mexican, Russian, Slavic, and Ukrainian people make fancy designs on eggs)
   h. Have students create their versions of the eggs in class.

HOW DID THEY GET THERE?:
1. Many people do jobs that enable eggs to be transported to the market so we can buy them. Students will predict and sequence the steps required to get eggs from the chicken to our homes.
2. Discuss the many steps in the egg production chain. Write each step on a large card. Students write the information in a log or journal.
   a. Hatchery/Pullet Person: Takes care of the newly hatched chicks until they are old enough to lay eggs.
   b. Feed Supplier: The feed supplier carefully mixes feed ingredients that the hens and chicks need to stay healthy.
   c. Egg Farmer: When the hens are old enough to lay eggs, they go to the farmer's laying house. The farmer makes sure the house is kept at the right temperature and the hens get all the food and water they need.
   d. Handler/Packer: The handler see that the eggs are carefully washed, graded, put into cartons, and refrigerated.
e. Inspector: The inspector makes sure that all washing, grading, and packing are done according to the government rules.
f. Trucker: The trucker drives the eggs to the supermarket.
g. Dairy Case Manager: The dairy case manager, at the supermarket, puts the cartons of eggs in the refrigerated case. They make sure the eggs are kept cool and removes the broken ones.
h. Cook/Chef: The cook makes all the delicious egg dishes you like.
i. Consumer: People eat eggs in many different ways.

3. Have students come up to the front of the room and arrange the cards in the right production order. Discuss the importance of each person in the chain. What might happen if one person did not do his job?
4. Have students role play each person in the egg production chain and tell about their job.
5. Ask students to imagine how other foods get to them. Discuss how to find more information.

FINE ARTS

EGG CARTON CRITTERS:
Materials: egg cartons glue
colored paper yarn
material scraps buttons
paint

1. Cut the egg cartons into strips of two or three sections. Children can become as creative as they wish. They can glue, paint, and construct critters of all kinds.
2. Some easy critters might be a caterpillar, frog, butterfly, and rabbit.
3. Addition ideas may be found in the book Egg Carton Critters by Robert L. Dunne and Donna Miller.

EGG PAINTING:
Materials: Egg yolks teaspoon
water tempera paints (all colors)
colored paper fork
1. Put an egg yolk and one teaspoon water in a bowl. Beat with a fork. Stir in tempera paint or food coloring. Prepare as many colors as you wish, keeping each separate or mixing for interesting results.

2. Have students paint designs on egg-shaped paper.

3. Have students use dyed, broken eggshells as mosaic art on paper, egg cartons or other containers to create gifts for the family.

MUSIC

SILLY EGG SONGS:
1. Have the class create new songs or raps about eggs. Have them pick a familiar tune and create new verses. For example:
   ("To I'm a Little Teapot")
   A little fresh egg, smooth and round
   I taste so yummy, that can be found.
   full of protein, not much fat.
   low in calories, think of that!

   (To any rap beat)
   Look what's cookin' in the pot.
   It's Mighty Egg, and that is hot!
   Hard or soft-cooked, poached or fried,
   Eggs will make your smile grow wide.

DRAMA

CAN IT BE:
1. You’ve just found an egg in an unusual habitat. You don’t know what kind of creature laid the egg.

2. Role play the creature who laid the egg.

3. Imagine yourself inside the egg. What is it like inside the egg? How do you feel before getting out? What position are you in right before your ready to hatch? What’s the first thing you do when you are hatched?

4. The children will act out their egg experience.

5. After acting out the hatching, draw a sequence of pictures of yourself coming out of the egg. Write a sentence under each picture, or write a story about the experience.
PHYSICAL EDUCATION

EGG TOSS:
1. Have partner teams line up in two rows facing each other. Have one member of each team toss a hard-cooked egg to his or her partner.
2. After each successful catch, have partners step backward, adding difficulty to the next catch.
3. Repeat until all but one egg is broken. Partners with the unbroken egg wins.

EGG RELAYS:
1. Using hard-cooked eggs and emptied eggs, have student relay teams carry eggs on spoons, passing the eggs to their teammates.
2. If an egg falls and cracks, it must be replaced before the team can continue.
3. Ask the students: Is one type of egg easier to balance than the other? Why?
BIRD LAB - CHICKEN EGG

SHELL

MEMBRANE

YOLK

EGG WHITE

AIR SPACE

CHALAZA

EGG SPOT
1. You can candle the eggs every few days. Fill in the chart each time with what you saw.

<table>
<thead>
<tr>
<th>DAY</th>
<th>WHAT YOU SAW</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th</td>
<td></td>
</tr>
<tr>
<td>10th</td>
<td></td>
</tr>
<tr>
<td>15th</td>
<td></td>
</tr>
<tr>
<td>19th</td>
<td></td>
</tr>
</tbody>
</table>

2. Fill in the eggs with a sketch of what you saw inside the egg. Show how much of the egg is filled by the embryo.
BIBLIOGRAPHY

Bishop, Ann. *Chicken Riddle*
George J. McLeod, Limited, 1972
Primary, Intermediate
Riddle Book
A collection of animal riddles whose answers take a surprising but logical twist.

Carle, Eric. *Rooster's Off to See the World*
Scholastic Inc., 1972
Primary
Picture
Rooster decides to see the world, so off he goes. He hadn't gone very far when he becomes lonely. He meets other animals and they are asked to join him. When night falls the animals become hungry, sleepy, cold, and frightened. One-by-one the animals leave Rooster for the comforts of their homes. Now Rooster was all alone, he thought for a minute, then said to the moon, "To tell you the truth, I am not only hungry and cold, but I'm homesick as well." Rooster turned around and went back home. That night after a good meal, Rooster falls asleep and has a wonderful dream - all about a trip around the world.

Fowler, Allan. *The Chicken or the Egg?*
Children's Press, Inc., 1993
Primary
Informational
A brief look at the physical characteristics, breeds, and habits of chickens and at how modern poultry farms produce eggs and chickens.

Fox, Mem. *Hattie and the Fox*
Macmillan Publishing Company, 1992
Primary
Picture
Hattie, a black hen, discovers a fox in the bushes, which creates varying reactions in the other barnyard animals.
Galdone, Paul. *Henny Penny*
Houghton Mifflin, Company, 1986
Primary
Folktale
When an acorn falls out of a tree and strikes Henny Penny on her head, she is sure that the sky is falling. Henny Penny decides to go and tell the king. Along the way she meets several of her friends, who join her when they hear that the sky is falling. The last animal they meet on their trip to see the king is Foxy Loxy. Foxy Loxy lures the animals to her cave and they are never to be seen again.

Hariton, Anca. *Egg Story*
Dutton Children’s Books, 1992
Primary
Informational
This book follows an egg from the time that it is laid, through its incubation under the hen’s body, to the chick’s birth after twenty-one days.

Heine, Helme. *The Most Wonderful Egg in the World*
Atheneum, 1983
Primary
Fantasy
The king must choose the most beautiful egg laid by three hens, one of which he will then make a princess.

Hutchins, Pat. *Rosie’s Walk*
The Macmillan Company, 1968
Primary
Picture
Rosie the hen takes a walk through the farm. A fox follows her. Through a series of mishaps, the fox is unable to catch Rosie.
Jeunesse, Gallimard, *The Egg*
Scholastic Inc., 1989
Primary
Informational
This book follows a hen's egg from the moment it is laid to the time the chick hatches out. It also introduces various egg-laying animals, such as birds, snails, and snakes.

Johnson, Sylvia A., *Inside an Egg*
Lerner Publications Co., 1982
Intermediate
Informational
The text and photographs trace the development of a chicken egg from the time it is laid until the chick is born.

*Little Red Hen, The* no author,
Houghton Mifflin, 1989
Primary
Traditional Tale
When the Little Red Hen finds some wheat, she asks her friends to help her, from planting the seeds to making the bread. Her friends say "NO," until the bread is made and ready to eat.

William, Garth. *The Chicken Book*
Dlacorte Press, 1990
Primary
Picture
An old English counting book
SNakes
SNAKE FACTS

* Snakes are under the scientific name of Herpeton, a Greek word for "crawling things."

* Scientists have traced the history of reptiles back to about 360 million years ago.

* There are about 2400 species of snakes.

* Snakes don't have legs, eyelids, outer ear openings, or bladders. Instead of a pair of lungs, they only have one.

* Snakes can coil, climb, and slither because they have a flexible spine made up of 100-400 vertebra, each of which is attached to a pair of separate thin ribs.

* Snakes have belly scales called scutes on their undersides. Muscles attached to the ribs pull and lift these scales, creating a series of wavelike motions.

* By flicking their forked tongue and with a structure in the roof of their mouth called the Jacobson's organ, a snake can smell their environment very well.

* Snakes have special heat sensors on their face and lips which detect heat from other animals. These heat sensors allow the snake to successfully hunt prey in complete darkness.

* Snakes always swallow their food whole.

* Snake's upper and lower jaws are not attached and their chins stretch apart, which allow them to eat animals larger than themselves.

* Snake don't have to eat as often as other animals.

* All snakes are meat eaters. Some snakes poison, constrict, or bite their prey.
* Most snakes lay eggs but some give birth to young.
* Snakes shed their skin as they grow.
* Snakes are cold blooded (poikilothermic).
THE SNAKE'S MISTAKE (PRIMARY)

Faulkner, Keith and Lamber, Jonathan
Price Stern Sloan, 1988
Primary
Modern Fantasy

A very hungry python slithers out looking for food. What he sees delights him, children on their way to school. One by one the python begins to gobble up the children. The very last child hears a noise, when she turns around to see what it is, she sees the snake. Quickly she reaches into her bag and grabs a pepper shaker. She shakes the pepper in the python's face. "Ah...ah...achew!" went the snake and out shot the children.

Environmental Topics: built environment, natural habitat

Environmental Concepts:
1. Wildlife adapts to its environment in ways that enable it to survive.
2. In any environment, living things have similar needs.

Discussion Questions:
1. What kind of an animal is a python? Is it a mammal, amphibian, reptile, or insect?
2. Would a snake really eat children? What do snakes eat?
3. Look at the pictures of the python and the children. How big is the snake look in the story? Do snakes really get that big?
4. How did the little girl stop the snake from eating her? If a giant snake wanted to eat you, how would you stop it?

INTEGRATING INTO THE CURRICULUM:

MATH
SNAKE COUNT:

Materials: small rubber snakes (purchased at a novelty store) cards with snakes and numbers on them.

1. The students will set out all the cards, then place the appropriate amount of snakes on each card.
2. Help the students to recognize numerals and gain number concept.

SNAKE PROBLEMS:
1. Create word problems using snakes.
   a. Two snakes went for a walk. One snake traveled five miles. The other snake travelled three miles. How many miles did the snakes travel in all?
   b. A hungry python visited our school. It ate three kids swinging on the swings, two kids on the slide, and five kids playing soccer. How many kids did it eat in all?
   c. The hungry python ate ten kids on the playground. Abigail threw pepper in its face. The python sneezed out two kids. How many kids are still in its tummy?

REPTILE NUMBER BOOK:
Materials: number book - each page in the book will have a number and a picture of a reptile on it
         reptile picture pages
         scissors
         glue

1. The students will cut apart the reptile pictures.
2. The students will glue the appropriate number and kind of reptile on each page of the book.

LANGUAGE ARTS
THE SNAKE'S OTHER MISTAKE:
2. Brainstorm different ways the children could save themselves.
3. Have each child write how they would be the hero of the story and save the other children.
4. Students will illustrate their stories.
5. A class book is made and bound in a snake-shaped cover.

EATEN ALIVE:
Materials: 1 x 3" piece of butcher paper
         crayons
         glue
         Poem "Boa Constrictor" by Shel Silverstein typed on paper
1. Each student will draw and color a picture of a boa constrictor on the piece of butcher paper.
2. The poem will be glued onto the snake.
3. The butcher paper will be glued into a circle.
4. The students will step into the center of their circle and hold onto the sides of the circle.
5. The students will recite and act out the poem, "Boa Constrictor." They will raise the butcher paper snake to each of their body parts according to the poem.

SCIENCE:
SNAKE CENTER:
1. Create a science center where students can observe snakes during free time or part of a learning center.
2. Place the snake(s) at a table, provide non-fiction books, magnifying glasses, art paper, markers, and a journal where the students can record their observations.
3. Observation/thinking skills can be enhanced by the following:
   a. Place in a jar, strips of paper with various questions and activities on them.
   b. The students will draw from the jar a piece of paper and do what it directs.
   c. The students will write their name on this paper, glue it into the journal, then write or draw the response in the journal page.
4. Examples of activities are:
   a. What colors is the snake? Draw it. Can you think of any other animals with the same colors? List them.
   b. How long is our snake? Find three snakes that are longer, list them. Can you find some snakes that are smaller? What are they?
   c. How does the snake move? Protect itself? Obtain food?
   d. Where do you think the snake lives? How can you tell?
   e. What is the value of the snake to the environment?
   f. If you and the snake can go on an adventure, where would you go and what would you do?
HIDE AND SNAKE:
1. Show pictures of animals in habitats that are camouflaged. See if the students can find them.
2. Discuss why camouflage is so important.
   a. for protection
   b. to more easily catch their prey
3. Write stories of what it would be like to be out of your habitat.
5. Have the students drawn their own "hide and snake" pictures. Share them with the class.

SOCIAL STUDIES
SNAKE MISBELIEFS:
1. List on the board everything the students know about snakes.
2. Go back to the circle and discuss items from the board., i.e., snakes are slimy, all snakes are poisonous.
3. Divide the class into groups of four. Give each group a misconception such as snakes are slimy, mean, and evil.
4. Each group is to convince the class that their misconception is not true. This can be done through drama or posters.

FINE ARTS
SNAKE DIORAMA:
Materials: shoe box (without lid) glue
           white construction paper scissors
           colored construction paper tape
           bakers clay
           items found in nature-sand, twigs, etc.
1. Lay the shoe box on its side. Cut a piece of white paper to fit the inside of the shoe box as the background for the diorama.
2. Draw a habitat for your snake, desert, mountains, rainforest, etc. Glue the picture into place in the box.
3. Use the colored construction paper to make trees, cactus, ferns, etc. Cut them out and attach to the bottom of the box with tape or glue.
4. Form snakes out of bakers clay, paint, and add to the diorama.
5. Add sand, twigs, or whatever is needed to make the diorama look realistic.
PAPER CHAIN SNAKES:

Materials: 1 x 6” paper strips glue
6 inch diameter paper circle scissors
movable eyes

1. The students will make a cut from the outside to the center of the paper circle. The cut edges will be folded over one another to form a cone-shape. This will be the head of the snake.
2. The movable eyes are glued to the cone.
3. The students will make an interlocking paper chain. This could be done in a pre-determined pattern, i.e., AB, ABB, or ABC.
4. The completed chain is glued to the head of the snake.

COOKING

EATIBLE SNAKES:

Materials: peanut butter
sunflower seeds without the shell flour

1. The students will roll 2 tablespoons of peanut butter into the shape of a snake. Flour can be used to prevent sticking.
2. The scales of the snake are formed by pushing sunflower seeds into the peanut butter.

PHYSICAL EDUCATION

SNAKE HUNT:

1. Place 10 to 15 objects along a 40 to 50 foot path across the playground.
2. Instruct the students that they are to walk along this path looking for the objects. If they spot one they are not to say anything and are not to touch them.
3. Allow the students 15 minutes for the walk, then return to class.
4. The students should record what they saw.
5. Compare their observations.
6. Discuss what made the objects harder or easier to spot.
In an every day village of Eronni, in Africa, Emeke herds his family's goats and dreams of making a wish to fly. His grandmother often said that Good Snake can make your wish come true. Many of Emeke's friends have heard of his wish, and tease him about it. One day while tending the goats, Emeke saw a strange thing. He saw animals moving toward a tree, not far from where his goats were feeding. In the large tree was Good Snake. All the animals were making wishes. In order for Emeke's wish to come true he had to make a kite using bark and bamboo from the jungle. The other animals wished to change aspects of their personalities, each believing in Good Snake. Emeke builds his kite. With his confidence in Good Snake, his wish to fly comes true. All Emeke's friends now believe Emeke can fly.

Environmental Topics: jungle animals, seasonal changes, energy sources, recycling

Environmental Concepts:
1. Living things are interdependent with their natural and physical environment.
2. People interact mentally and emotionally to the objects and events in their environment.
3. Living things and environments are in constant change.

Discussion Questions:
1. What part of the world does this story take place?
2. What types of animals live in Africa?
3. Emeke's friends laugh at him when he says that Good Snake can help him to fly. Why? What do you think of their actions?
4. Emeke has been searching for Good Snake. Why does he want to run away when he finally sees the snake?
5. Where does Good Snake live?
6. How do the characters in the story feel about Good Snake? As you were reading, how did you feel about Good Snake?
7. What do Hyena, Elephant, and Rhinoceros wish for?
8. Who is responsible for their wishes coming true, Good Snake or the animals themselves? Why do you think so?
9. If you could ask Good Snake for a wish what would it be?
10. Why do you think the animals wanted to change aspects of their personality?
11. We often judge people and animals by their appearance. What would we do if we couldn't use appearance as a clue to their behavior?
12. As you have seen, appearances can be deceiving. How should you really judge yourself and others?

INTEGRATING INTO THE CURRICULUM:

MATH FRACTIONS:
1. Animals use camouflage to protect themselves from predators. Color and body shape are two important variables that enable an animal to blend into its environment.
2. The children will see how shape and color help the snake to camouflage itself. The children will work outside in small groups of five or six. Each group will receive two large bags of chocolate M&M's candy, which they will open and count the contents. The candy represents critters that depend on camouflage for protection. Be sure to choose an area where the student can hide their critters. This activity works best if the chosen area is not too large and has definite boundaries.
3. The teacher asks the children to turn around while the teacher takes the group's candy and spreads it within their area.
4. The children will have two minutes to collect as many M&M's as they can.
5. They will then record their findings on the activity sheet entitled "Now You See It, Now You Don't."
6. The group will collect all the M&M's and try the game three more times.
7. The child will then convert their findings into fractions on the sheet.
8. For a more challenging activity the children change the fractions into decimals and then into percentages.

LANGUAGE ARTS
A FIELD GUIDE TO REPTILES:
1. Because snakes are reptiles, have the children develop a group "field guide" to local reptiles found in your area. Contact a nature center/museum to find out which reptiles are found in your area. Have each child choose one species and research the following:
   a. What does the animal look like?
   b. Where does the reptile live and what kind of habitat does it prefer?
   c. How does the reptile get around?
   d. What does the reptile eat and how does it find or capture its food?
   e. What animals prey on the reptile and how does it defend itself?
   f. How does their reptile interact with others of its own kind?
   g. Does it give birth or lay eggs? How does it care for its young?
   h. Describe any distinctive adaptations or behavior of the reptile.
2. After the children have researched their reptiles, have them write the information in a field guide format, with short descriptions.
3. Have them draw a picture of the animal.
4. Combine the completed field guide entries to make a wonderful book displaying local reptiles.

SNAKES AS A SYMBOL:
1. Read the background information to students. The use of snakes as symbols has been popular throughout the ages. Egyptian Pharaohs wore likenesses of poisonous snakes on their headdresses in the belief that this protected them from harm and gave them power to destroy their enemies. The Caduceus, a winged staff with two snakes coiled around it, has become a symbol of medicine because the ancient Greeks thought that snakes had the power to heal. The first American flag pictured a rattlesnake with thirteen rattles representing the colonies and bore the words, "Don't Tread On Me." Most people throughout the centuries have
considered the snake a symbol of evil and repulsiveness. Numerous superstitions are still connected with snakes, but with a better understanding of the life habitats of these creatures, the foundations of such superstitions can be destroyed.

2. Discuss how snakes throughout history were used as a symbol of evil and protection.
3. Numerous superstitions are still connected with snakes. Children are to research various fables and legends where snakes have been symbolized.
4. Children are to report back to the teacher with the fables and legends. The teacher will read the legends or fables to the class.
5. Each child will create a new legend or fable about snakes.

SCIENCE
HOW DO SNAKES MOVE?:
1. Have students observe snakes moving on smooth, rough, inclined, and cluttered surfaces.
2. Discuss the observations. Explain that snakes can coil, climb, and slither because they have a very flexible spine made up of 100-400 vertebrae, each of which is attached to a pair of separate, thin ribs. Most snakes move in a series of S-shaped curves pushing themselves along using plants, rocks, sticks, and other irregularities as shove-off points.
3. Children will put their bare feet on the ground and try to make them move forward by wiggling their toes. This gives them the idea of how snakes move by using their muscles.

HEAR THOSE VIBRATIONS:
   Materials: tuning fork
1. Share with the class that snakes do not have outer ears, so they depend on vibrations to "hear" what's going on.
2. Demonstrate how to listen to a tuning fork with the class. To avoid scratching the tuning fork, make sure the children don't tap it on a metal surface.
3. Hold the fork by the stem and tap it on a wooden chair or table. (Be careful not to touch the two prongs after hitting the fork on the table)
4. Hold the fork next to your ear.
5. Tap it again and place the base of the stem against your chin. (Press hard!)

6. Describe what happens each time. Do you think the snake could hear the tuning fork if you held it next to its head? If you placed it against its chin? What does this say about the way snakes hear?

7. Discuss with the children that they should have heard the same sound each time. The reason they heard a sound when they held the fork to their chin is that vibrations traveled through the bones in their jaw and skull to the fluid in their inner ear. Here the vibrations were "translated" into nerve impulses and interpreted as "sound" by the brain.

SOCIAL STUDIES
PEOPLE'S USES OF REPTILES AND AMPHIBIANS:
1. Children will study historic and modern uses, as well as different cultural uses of reptiles and amphibians.
   a. Frogs legs and turtle soup- for special foods
   b. Skins from alligator, lizard, and snakes- leather goods
   c. Tortoise shells- eye glasses, combs, other objects
   d. Frogs- used as laboratory animals
   e. Poisonous snakes venom- medicine

2. The children may discover many other ways in which humans have used reptiles and amphibians. They also may discover that some of these animals are endangered and that some states have regulations protecting them.

3. Students can do a written report and make a poster of alternative uses for these animals.

4. Have the children create new government laws which protect certain animals.

FINE ARTS
PAPER CLIP SNAKES:
Materials: large paper clips colored paper
          red yarn glue

1. Children will make a long chain by interlocking ten paper clips together.

2. Provide each child with a piece of colored paper, 9 x 12 inches or smaller, to be used as the head.
3. Bend the paper to create a cone-shape and staple. This will be decorated with eyes.
4. Poke a hole through the pointed part of the cone using a pencil. Put a five inch piece of yarn through the hole and tie a knot inside the cone to create a dangling tongue.
5. To attach the head (cone) and body (paper clips) simply add a narrow strip of paper across the top of the cone to create a handle. Take the last paper clip from your chain and interlock it with the paper handle, as was done with all the other clips.

SOCK SNAKES:

<table>
<thead>
<tr>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>old knee high socks</td>
</tr>
<tr>
<td>buttons</td>
</tr>
<tr>
<td>crayons/markers</td>
</tr>
</tbody>
</table>

1. Puppets made from knee socks work best for the snake puppets.
2. Make a mouth by putting your hand in the foot of the sock.
3. Figure out where the eyes should be placed on the snake. Mark these points with a crayon or marker before taking off the sock. Also figure out where the tongue should go.
4. Cut out eyes and tongue from colored paper or scrap material. Glue them in place.

COOKING

EDIBLE SNAKES:

<table>
<thead>
<tr>
<th>Materials</th>
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</thead>
<tbody>
<tr>
<td>1 banana, cut into 6 equal slices per student</td>
</tr>
<tr>
<td>5 teaspoons of peanut butter</td>
</tr>
<tr>
<td>2 teaspoons of lemon juice</td>
</tr>
<tr>
<td>2 inch piece of thin licorice</td>
</tr>
<tr>
<td>2 raisons</td>
</tr>
</tbody>
</table>

1. Each child will need the materials above to create their edible snake.
2. Brush the banana slices with lemon juice; then place the six slices of banana on a small plate.
3. Spread 1 teaspoon of peanut butter between each of the slices of banana and press together.
4. Place a dab of peanut butter on the two raisons and press on the last banana slice to form eyes.
5. Poke the 2 inch piece of licorice into the banana slice to form a tongue.
6. Your children will love to make this nutritious snack.

PHYSICAL EDUCATION
SLITHERING SNAKES:
1. Separate the children into groups of about six per team. This can vary depending on your class size.
2. Each team forms a single line, one child in the back of another. Each child holds the child's waist in front of them. This forms their teams snake. They may want to name their snake.
3. A limbo stick is set up. Each team (snake) has to work as a group to get under the limbo stick without touching it.
4. As teams pass under the stick, those who touch the stick are out for the remainder of the game. Those who make it, continue.
5. The limbo stick is lowered after each successful round.
6. The last snake left is the winner! (Music may be added to create a fun atmosphere.)
NOW YOU SEE IT, NOW YOU DON'T

PREDICTIONS:
1. How many critters (candy) will be found?________
2. How many critters will not be found?________

CRITTER FRACTIONS

<table>
<thead>
<tr>
<th>Critters Found</th>
<th>Total Critters</th>
<th>Fraction Found</th>
<th>Lowest Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAME 1:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAME 2:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAME 3:</td>
<td></td>
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<td></td>
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</tbody>
</table>

DISCUSSION:
1. Why was it easy to find your critters?________
2. What do the critters that were not found have in common?________
3. Which color critter was the hardest to find?________
Ata, Te. Baby Rattlesnake
Children's Book Press, 1989
Primary
Folktale
Baby Rattlesnake longed for a rattle. He cried every night and every day, until he got one. He used his rattle to scare many creatures. When he scared the Indian chief's daughter, she stepped on his rattle, shattering it pieces.

Baker, Keith. Hide and Snake
Harcourt Brace Jovanovich, 1991
Primary
Picture Book
A colorful snake invites the reader to play a game of hide and see.

Broekel, Ray. Snakes
Childrens Press, 1982
Primary
Informational
This book describes the physiology, habits, and behavior of snakes.

Chinery, Michael. Snake
Troll Associate, 1991
Primary, Intermediate
Informational
This book uses the North American corn snake to introduce the reader to snakes. The life cycle is discussed, its physiology, eating habits, and mating. The book contains both drawings and photographs.

Czernecki, Stefan and Rhodes, Timothy. The Singing Snake
Hyperion Books of Children, 1993
Primary, Intermediate
Folktale
This is an Australian aboriginal folktale. An old man becomes tired of the noisy animals that surround him. He can't make the animals silent so he tries to improve their voices. He tells the animals that he will make a musical instrument in honor of the creature who
develops the most beautiful singing voice. Snake comes to the conclusion that his raspy voice will never win, so he devises a sly plan. Snake wins the contest but loses his voice and friends.

Johnson, Angela. The Girl Who Wore Snakes
Orchard Books, 1993
Primary
Picture
Ali discovers that there is someone else that thinks snakes are beautiful and loves them as much as she does.

Hayes, Joe. Soft Child, How Rattlesnake Got Its Fangs
Harbinger House, 1993
Intermediate
Folktale
A long time ago the Sky God made all the animals. When he had finished he told each animal they may ask for a way to protect itself. The rattlesnake asked for a way to let the other animals know where he was so he wouldn’t be stepped on. He was given a set of rattles. The other animals knew that he was perfectly harmless and soon picked on him to make him rattle his tail. The Sky God, seeing this, gave the snake fangs and told him he was to use the fangs only to protect himself.

Lauber, Patricia. Snakes are Hunters
Harper and Row, Publisher, 1988
Primary
Informational
This is a Reading Rainbow selection. It describes the physical characteristics of a variety of snakes and how they hunt, catch, and eat their prey.

Noble, Trinka Hakes. The Day Jimmy’s Boa Ate the Wash
Dial, 1980
Primary
Modern Fantasy
A class field trip to a farm becomes chaotic when Jimmy tries to introduce his pet boa to the farm. The hen house visit ends up in an egg throwing contest. The pigs climb on the school bus and eat the
student's lunches. The farmer's wife discovers the boa eating her wash. This book has a surprise ending.

Parsons, Alexandra. *Amazing Snakes*  
Alfred A. Knopf, 1990  
Primary, Intermediate  
Informational  
The text and photographs introduces amazing members of the snake world, including the sunbeam snake, milk snake, and reticulated python.

Petty, Kate. *Snakes*  
Aladdin Books, 1990  
Primary, Intermediate  
Informational  
This book discusses snakes from birth to adults. Many different types of snakes are introduced. The back of the book asks important questions for the reader to answer.

Ungerer, Tomi. *Crichtor*  
Harper and Row, 1958  
Primary, Intermediate  
Modern Fantasy  
Madame Bodot's son sends her a baby boa constrictor for her birthday. At first she is upset. But she learns that the boa named Crichtor is not poisonous, she comes to love it.
REFERENCES


