TEACHING KATE
TEACHING KIDS ABOUT THE ENVIRONMENT

LEAPING INTO FROGS

Grade Level: 2-3 **Time Required: 7+ class periods**

SC Science Standards

This lesson plan was correlated with only the grade level specified unless otherwise noted.

Grade 2:
- I. A. 1. a
- I. A. 4. a
- I. B. 1. a, b, c, d
- II. A. 2. a, b
- II. B. 1. a, b, c
- II. B. 2. a

Grade 3:
- I. A. 1. a
- I. A. 4. a
- I. B. 1. a, b, c, e
- II. A. 1. b
- II. B. 1. a, b

Purpose

Students will observe and examine frogs. They will compare and contrast frogs and toads. They will explain the process of metamorphosis. They will illustrate the life cycle and make a food chain. After completion, students will have gained an understanding of how frogs fit into the ecosystem.

Skills

Classifying, comparing and contrasting, identifying, mapping, observing, written and verbal communication.

Concepts

Frogs have a necessary use in the ecosystem; they are a part of the food chain; their niche in the ecosystem is to help reduce the number of insects; they are a metamorphic animal.

Materials Needed

chart paper to record appropriate and on going information
a collection of frog eggs
1 large ziploc bag for gathering eggs (optional)
aquarium with:
- a ventilated cover for the top
- a plastic storage container to hold water
- gravel
- potting soil
- plants
- flat piece of wood

small containers (e.g. butter tubs) for gathering:
- green algae
- caterpillars
- earthworms
- snails
- slugs
- crickets
- flies
- moths

copy of *Frog and Toad Are Friends* by Arnold Lobel
diagram of food chains
diagram of life cycle
markers
journals for each student
scissors
construction paper
magnifying glasses

Definition of Terms

Amphibian	An animal that spends part of its life in water and part on land. It breathes by gills in its early stage of life, then later breathes using lungs.
Biological Control	Predator - prey relationship where the population of a pest species is reduced or eliminated by a natural predator of that pest.
Carnivore	An organism that feeds on animals.
Ecological Niche	The role played by an organism in a biological community.
Ecosystem	A community of life in an environment.
Food Chain	An arrangement of organisms in an ecological community according to predator - prey relationships. Arranged in order of predation, each uses the next lowest on the chain as a food source.
Habitat	The place where an animal or plant normally lives and grows.
Herbivore	An organism that feeds on plants.

Hibernation	The act of passing the winter, or a portion of it, in a state of sleep.
Life Cycle	The changes an organism passes through during its lifetime.
Metamorphosis	A major change in form or structure some animals go through during their life cycle.
Predator	An organism that kills and eats animals.
Prey	Animals that are killed and eaten by other animals.
Tadpole	Immature or juvenile (larval) stage in frog and toad development.

Before the Session

Make a journal for each student, using a frog pattern as a cover. Obtain frog eggs to set up a frog habitat in the classroom. Eggs can be purchased from Carolina Biological Supply Company, Frey Scientific Company or Nasco Science. They may be obtained also from the edge of a pond, swamp, or stream. When the eggs hatch gather green algae for the tadpoles to eat. As they grow and develop they can be given food which is listed under Background Information. Gather pictures of various frogs and toads and mount on construction paper. Draw an example of a food chain and a life cycle. Obtain a copy of *Frog and Toad Are Friends* written by Arnold Lobel. Invite a local county conservationist or someone from the South Carolina Department of Natural Resources to visit the class with a collection of amphibians.

Background Information

Frogs are amphibians. Other amphibians include toads and salamanders. They are cold-blooded animals and live both on land and in water. They live on every continent except Antarctica.

In the spring, the female can lay up to 3,000 eggs. Each egg is covered by layers of jelly which forms a slippery mass called frog spawn. It takes about two weeks for the eggs to hatch into tadpoles or "polliwogs." During this stage of their life cycle, they depend on gills to obtain oxygen from the water (or breathe), just as fish do. As frogs grow a process called metamorphosis occurs. During this process they slowly loose their tails and grow legs. Approximately 10-12 weeks later their legs are fully developed, tails are gone and they begin to breathe oxygen using lungs. Altogether, this process takes about four months.

One of the most interesting facts about frogs is the way they eat. In the tadpole stage they are omnivorous eating algae or water fleas. When adults, however, they are carnivores with a diet

consisting of mealworms, snails, slugs, crickets, flies, moths and sometimes even each other. To catch these animals the frog flicks out its sticky tongue to which the prey adheres and brings them back to its mouth. Frogs swallow their prey whole. They close their eyes to push the food down their throats.

Although frogs and toads are from the same family, they differ in many ways. Toads have a larger body. They also have darker and drier skin which appears to be covered with warts. Frogs have skin which is damp and smooth. Toads live mainly on land, while frogs spend the majority of their lifetime in water.

Suggested Lesson Plan

Lesson 1

1. The teacher will point out the frog eggs in the aquarium and ask the students to predict what they think will happen to the eggs. Record these predictions on chart paper. Then tell them they will be making observations 1 and 2 times a week. They will need to observe such behaviors as how they eat, how they move, what sounds they make, how they change, etc.

2. The class will brainstorm what they know about frogs. The information will also be recorded on chart paper. Keep chart on-going throughout the unit.

3. The teacher will read "Spring," a short story from *Frog and Toad Are Friends* by Arnold Lobel.

4. The teacher will discuss hibernation with the class and ask when, where and why certain animals hibernate.

5. The students will decorate and personalize covers of their journals. They will also write a few sentences about what they learned and observed.

Lesson 2

1. The teacher will show many pictures of frogs.

2. Students will observe and identify physical characteristics of a frog by examining its physical appearance.

3. Students will draw a frog and write an acrostic poem, using the word FROG, in their journals.

Lesson 3

1. After reading the rest of the stories from *Frog and Toad Are Friends*, students will describe the kinds of places where frogs live.

2. The teacher will explain what a habitat is and give examples. The class will discuss and list other animal habitats.

3. In groups, students will draw and color a map that includes the places mentioned in *Frog and Toad Are Friends*.

Lesson 4

1. Based on the frog's habitat ask students what it eats. Then explain the terms predator and prey and their importance to an interacting ecological system.

2. The class will compile a list of the frog's prey.

3. Discuss the definitions of herbivore and carnivore and give examples of animals for each category.

Lesson 5

1. Lead a discussion on food chains stressing the importance of how each member plays a role in the ecosystem. Without one member there may be devastating effects on the remaining population.

2. The teacher will show an example of a food chain. Using another animal the class will make a food chain.

3. In groups, students will cut links from paper and will arrange them in order to form a chain.

Lesson 6

1. Using pictures of frogs and toads, students will identify physical characteristics by examining their physical appearances.

2. The class will construct a Venn diagram comparing the similarities and differences of frogs and toads.

3. Teachers will define amphibians and discuss why frogs, toads and salamanders are classified in this category.

4. Students will complete a table comparing and contrasting frogs and toads.

Follow-Up: An expert on amphibians will visit the classroom.

Lesson 7

1. Teacher will discuss life cycles of various animals including the life cycles of amphibians.

2. Define metamorphosis. Show and discuss pictures at each stage.

3. Have students write a paragraph explaining metamorphosis.

Note: Students will continue to keep observations until the frogs are fully developed. Magnifying glasses should be used when necessary.

Application

Frogs and toads are very useful animals to any one interested in biological control of pest species. Because their voracious appetites aid in the control of many organisms considered pests around the home, garden and pond they are often a welcomed creature. The use of frogs and toads as a biological control can reduce or eliminate the amount of pesticides needed to control unwanted organisms. Ultimately, the ability to control pests with out the use of chemicals can only benefit our environment.

Extension

After the frog is fully developed, students will illustrate the life cycle of a frog. They will need to include the four stages: eggs, polliwog/tadpole, tiny wiggler and frog.

Resources Available

Amphibians and Reptiles of the Carolinas and Virginia. 1980. Bernard S. Martof, William M. Palmer, Joseph R. Bailey and Julian R. Harrison, III. The University of North Carolina Press, Chapel Hill, North Carolina.

Carolina Biological Supply Company. Box 187. Gladestone, Oregon 97027.

Frey Scientific Company. 905 Hickory Lane. Mansfield, Ohio 44905.

Frog and Toad Are Friends. 1970. Arnold Lobel. Weekly Reader Books. Harper and Row, Columbus, Ohio.

Frogs and Toads Theme Unit. 1991. JoAnne Kato. Creative Teaching Press.

Frogs, Life Story. 1991. Michael Chinery. Troll Associates.

Nasco Science. 901 Janesville Ave. Fort Atkinson, Wisconsin 53538-0901 or 4825 Stoddard Rd. Modesto, California 95356-9361. (1-800-558-9595).

The Audobon Society Field Guide to North American Amphibians and Reptiles. Alfred A. Knopf, Inc.

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