

Why So Many Frogs?: Lesson Plan 4

Teacher:

Date:

Subject area / grade level: Science / 6th grade

1. **Materials:** Copy of the program "The Living Edens: Costa Rica, Land of Pure Life"
2. Masses of fertilized frog eggs. A mass of 300 eggs is needed for a class of 30. If these can not be obtained locally, they may be purchased through a number of biological supply companies. (Carolina Biological Supply Company 1-800-334-5551)
3. Spinach (cooked well)
4. Source of fresh water.
5. Centimeter ruler.
6. Ziplock snack size bags.

Standard: Ecology (Life Sciences)

1. Knows the organization of simple food chains and food webs (e.g., green plants make their own food with sunlight, water, and air; some animals eat the plants; some animals eat the animals that eat the plants)
2. Knows that plants and animals progress through life cycles of birth, growth and development, reproduction, and death; the details of these life cycles are different for different organisms
3. Knows how the interrelationships and interdependencies among organisms generate stable ecosystems that fluctuate around a state of rough equilibrium for hundreds or thousands of years (e.g., growth of a population is held in check by environmental factors such as depletion of food or nesting sites, increased loss due to larger numbers of predators or parasites)

Lesson objective(s):

By the end of this activity, students will:

1. Be able to explain the different stages in the growth of a frog.
2. Analyze and collect data to make generalizations about a larger population.
3. Determine the survival rate of a population of tadpoles under controlled conditions.
4. Explain why organisms produce large numbers of young.

***This activity will take several weeks to complete. It will take one to two periods to watch the video and discuss the concepts. Depending on the type of frog eggs that you acquire, you will obtain results over a period of four to six weeks.

Differentiation strategies to meet diverse learner needs: Work in partners; use of pictures; donation of materials by other students; clear demonstrations

ENGAGEMENT

1. Watch the video "The Living Edens: Costa Rica, Land of Pure Life" with special emphasis on the

first 7 to 8 minutes of the film. Discuss the number of eggs that are produced by the turtles and the dangers that are faced by the young.

2. Ask students if new generations of other species face the same or similar dangers as they grow. Have small groups of 2 to 4 students take a species from your area and speculate on the dangers that face their young. Pictures of the organism could be drawn on newsprint with the dangers listed to the side with short presentation given to the class.

EXPLORATION

1. Obtain a large aquarium containing pond water and some aquatic plants. Place frog egg masses into the aquarium and have students estimate the total number of eggs in the mass. Students should be able to explain how they determined the number of eggs. Students should be encouraged to pick up the mass.
2. Take clear plastic cups for students to withdraw small groupings of eggs from the aquarium, and have students start a journal of daily observations. Students should record the size of an egg, draw a picture and record observations. Have students keep a chart with an estimated size of the tadpoles. This is best done in groups of four. At the end of each observation, students return the eggs to the aquarium. (You may have to cut the egg masses with scissors to get small grouping of eggs.)

EXPLANATION

1. The instructor should emphasize how to care for the eggs each day. Discuss the sensitivity to soap, chemicals (especially chlorine). All water added to eggs or tadpoles must sit in the open for a day or be boiled and aerated. Tadpoles are fed spinach that has been boiled to a slimy consistency.

ELABORATION

1. As the eggs develop, students should estimate the numbers that have not grown. (This will be about 25%.)
2. As the eggs hatch into tadpoles, students can be given 10 tadpoles in a Ziplock plastic bag to take home and raise. They are to continue the daily journals for a period of two weeks. Students can place the tadpoles in either glass bottles or plastic containers. Half of the water in the container should be replaced twice a week.
3. As the tadpoles develop legs, students will need to place sticks or rocks in the container so they can begin to climb on them. Frogs should be released or returned to school when both front and back legs have grown.
4. Students will present a final report that includes their journal along with a paper describing the development of frogs from egg through tadpole to small frog.
5. A number of the developing tadpoles will fail to grow to maturity. When the final reports are submitted, students should mark on a class collection chart the number of tadpoles that they cared for and the number that survived to be released. The class numbers should be used to calculate the % of individuals that did not survive to adulthood. (This will be about 25%)

EVALUATION

1. Discuss the findings with the class. Identify that no predators were present and that the number of individuals that would survive would be lower in the wild.
2. Use the numbers generated as a class to estimate how many individuals in a 500 egg mass would grow to maturity both with and without predators.

Name: _____

Date: _____

Daily Journal Entry

Complete a journal that includes daily observations, a size chart and drawings. The drawings should show the development of the tadpoles with labels where appropriate. Some sample labels would include leg buds, gills, egg sac and eyes.