



Invent an Animal

Adapted from Outdoor Biological Instructional Strategies (OBIS)

Concept Using vegetables, water colors, natural and other materials, students create an animal to fit a habitat and fill a niche in nature.

Objectives Students will develop an understanding that animal species have evolved specific adaptations to their environment for survival.

Grade Levels: 2-6

Time Needed: two 40 min. periods

Subjects to Integrate: Art, Environmental Education, Science

Topics: adaptation, camouflage, evolution, survival, niche, habitat

Skills: motor, social, analytical, artistic

Materials

Necessary Materials: potatoes, carrots, green beans, watercolor paints and brushes, toothpick, natural materials, glue

Optional Materials: pipe cleaners, cotton balls, colored paper, scrap cloth, beans, clay tools or picks

Background

A species survives when it can adapt to changes in its environment. Each species occupies a niche in an ecological community. To occupy a niche the species usually has particular physical, physiological, and behavioral traits that allow it to survive. For example, the beaver has a body adapted for swimming and teeth adapted for cutting trees. It has specific behaviors for warning other beavers of danger, like slapping its tail on the water. Any deviation of a beaver's physiology, anatomy, or behavior will increase or decrease the chance of survival of that individual beaver. Beavers that are better adapted to their environment will survive to leave more offspring than other members of the species. Over time, the gene pool changes so that all members of the species have inherited these adaptive traits. This process is called natural selection and it is the primary explanation for evolution of organisms. It allows species to change or evolve over time and adapt to changing environments.

Procedure

The activity starts with the students going outside and selecting the habitat their animal will live in. On the school grounds or in a natural area, students select a habitat for a species that they will invent. This might be a particular kind of tree branch, the curb, the edge of the lawn or perhaps the bricks of the school wall. They will use only the materials provided and create an animal that is adapted to surviving in the habitat they have chosen. The animal may be a predator or prey species. It can represent any animal, including insects and larger animals. The activity is more exciting if played as a contest and the students' animals are judged by several criteria. Or, cooperative learning may be the teaching method of choice and teams of students build the animals.

They return to the classroom and build the animal. The animals are placed in their habitats the next day and this allows the students enough time to really fit the animals to their surroundings. It is necessary to set some rules, like in any game. These are suggested:

- The animal must be at least six and a half centimeters (3 inches) long.
- The animal must have at least four appendages.
- The animal must be built with the materials provided. They can be camouflaged with the materials provided, but the animal must be in full view, i.e., not buried or partially hidden.

Tell students that the animals will be judged by four criteria:

1. How well it fits the habitat
2. The animal's niche – how well the animal appears to be adapted to for its environment
3. Creativity
4. Scientific name – genus and species (Older students may have learned about the derivation and use of scientific names)

A highest point value is given for each category of judging. A team of teachers or other students can serve as "outside" judges. The owner(s) of the animal being judged directs the judges to a spot not closer to or farther than six feet from the animal and the judges try to locate the invented animal. All students should view each other's invented animal and listen to the descriptions.

Extend the Activity

Divide the group into two teams. Each team is given an area to hide their invented animal in. The animal can be camouflaged with paint or attached materials but they cannot be buried or hidden from view. Each team looks for the others team's animals in a given amount of time. Students can then retrieve any animals that were not discovered.

Ask students to research real animals that occupy unique niches or that have interesting adaptations for extreme environments. For example a parasitic mite may spend its entire life in the ear of a particular species of mouse, eating skin cells. The female mosquito has highly adapted mouth parts for sawing through the skin of warm blooded animals and pumping up the blood. She must do this prior to laying her eggs.

Have students work in teams to create a diorama or field guide page about an invented animal. Have them discuss the animal's habitat, foods, habits, social interactions, predators, reproduction, etc. The diorama might be of their 'natural' habitat, or what their zoo environment might be.

Writing: have students compose field guide pages, poetry, or essays about their animal.

Suggested Assessment

Allow the judge's score on the creation of the animal to stand as a score on the project. It serves to tell the teacher the student's understanding of habitat, niche and adaptation.

Additional Resources and References

<http://www.projectwild.org>

"Blue Ribbon Niche"

"Fashion a Fish"

<http://www.lhs.berkeley.edu/pass/passv06/PASSv06-OmicronCreatures.pdf>

Creatures from Omicron

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Glossary

Adaptation - the ability of a species to survive in a particular ecological niche because of changes in form or behavior; any alteration in the structure or function of an organism that results from natural selection and allows the organism to become more fit to survive and multiply in its environment.

Habitat – The area or natural environment where an organism or ecological community normally lives or occurs.

Natural selection - key mechanism of evolution; natural process where the organisms best adapted to their environment tend to survive and genetically transmit their traits in increasing numbers to succeeding generations while those less adapted tend to be eliminated.

Evolution - Change in the genetic composition of a population during successive generations, as a result of natural selection acting on the genetic variation among individuals, and resulting in the development of new species.

Niche - the function or position of an organism or population within an ecological community; the particular area within a habitat occupied by an organism.