

TRB 5:5 - Activity 7: Variations for Survival

Summary

Students will choose from a number of final project options to describe how the physical characteristics of each organism provide it with a survival advantage in the environment in which it lives.

Main Core Tie

Science - 5th Grade

[Standard 5 Objective 2](#)

Materials

Pairs of pictures of related organisms that live in very different habitats and brief facts about each organism. Examples of organism pairs include: polar and black bears, snowshoe and jack rabbits, elephant and harbor seals, alligators and crocodiles, bumble and carpenter bees, prairie dogs and marmots, red or white-tailed deer and caribou, jaguars and pumas, bobcats and lions, mute and black swans, komodo dragons and lizards, water buffalo and bison, swallowtail and skipper butterflies, reindeer and elk (wapiti), gray and arctic foxes, leopards and lynx.

Teaching Tip: The success of this activity depends on having a good set of pictures with short, informational facts. Zoobooks Magazine, which your library may have, provides excellent pictures with brief facts. Pictures also can be collected from Ranger Rick, Wildlife and National Geographic magazines. You may wish to make overheads of the pictures of the two organisms chosen for whole-class work.

Copies of short, summarized facts about the two organisms chosen for whole-class work. (one for each student)

Dictionaries and Thesauri for student use

Additional Resources:

Zoobooks Magazine. Pictures and information about many animals are available online at <http://www.zoobooks.com>. Individual magazines and sets can also be purchased (see website or call 1-800-992-5035).

Background for Teachers

Members of a species are alike in many ways. However, individuals within a species show small differences. Variations are differences in appearance of an inherited trait among the members of a species. Variations can be observed in traits related to size, shape, behavior, function and body parts. Most variations are minor and include differences in hair color, whisker length and flower color.

Others may be major and quite apparent like a cat with six toes on each paw or an albino deer. All of these variations are inherited and can be passed down to the offspring from the parent organism.

Variations in individuals may affect their ability to survive in a changing environment. During the course of many generations, a variation that provides a survival advantage can become widespread in a population because individuals within it have a higher probability of reproducing.

Plant breeders take advantage of variations to produce improved crops. For example, U.S. potato farmers spend millions of dollars each year on pesticides, but insects become resistant to these pesticides. In Bolivia, a species of wild potato has hairs on its leaves that release a sticky chemical when touched. They act like flypaper and trap pests that feed on the leaves of the potato plant. However, these potatoes are very small. Through plant breeding, scientists have been able to combine the large size trait of U.S. potatoes with the insect-resistance trait of the Bolivian potatoes to develop a high yielding, large, insect-resistant variety of potatoes.

Intended Learning Outcomes

- 1-Use science process and thinking skills.
- 2-Manifest scientific attitudes and interests.
- 3-Understand science concepts and principles.
- 4-Communicate effectively using science language and reasoning.

Instructional Procedures

Begin by showing students pictures of two related organisms that live in very different environments (see “Materials ” for examples of organism pairs).

Provide each student with a copy of the short, summarized facts about these two organisms.

As a class, discuss and describe the environment in which each organism lives.

As a class, make a list of physical characteristics that are similar between the two organisms.

Then make lists of the physical characteristics that are unique to each organism.

Teaching Tip: You may find it helpful to use a graphic organizer, such as a T-chart, to help your students organize this information.

As a class, discuss how these variations give each organism a survival advantage in its unique environment.

Model with the class the writing skills you want them to use on their own for Step 8. Teaching Tip: For example, for a comparison paper, you might: 1) discuss the characteristics of a good paragraph, such as a topic sentence, supporting arguments and a conclusion; 2) as a class, write a paragraph about the similarities between the two organisms; 3) outside of class, teachers should write a paragraph for each animal about its unique character including errors and extraneous information that need to be edited out; and 4) model revision and editing by discussing and editing, as a class, the paragraphs the teacher wrote. For a poem in a specific format, you might: 1) describe the “rules ” of the format; and 2) as a class, write a poem using the format about the two animals.

Pair pictures of related organisms that live in different environments and have each student choose a pair for further research and writing.

Have students write a comparison paper, a type of poetry, a research report, or make a poster or a brochure (assign one or a give students a choice) describing how the physical characteristics of each organism provide it with a survival advantage in the environment in which it lives. Have a dictionary and a thesaurus available for students to use as they research

Extensions

Examples of Class Similarities	Work That Integrates	Writing Skills
between bears	Differences unique to the polar bear	Differences unique to the black bear
Claws	White, transparent, hollow fur	Black & brown fur
Thick fur	Black skin underneath	
Body build & shape	Large, wide, non-slip paws	Smaller paws
Small ears	Basically a carnivore	Omnivore
Long nose	Snowy, cold environment	Forested environment
Small tail	Long hind legs	Shorter legs
1-2 cubs/year	Hunting techniques	Food gathering techniques
Live in dens	Layers of blubber	
Store fat	Swims in the ocean	Climbs trees Smaller in size

Bear Cousins

Polar bears and brown bears could be considered cousins that live in far-off lands. Like family members, they have many similar characteristics that indicate they are from the same family. Bears are characterized as having big barrel-shaped bodies covered with thick fur, and stout, strong legs. They have small, circular-shaped ears and elongated noses that end with black nostrils. The claws of a bear are quite ominous-looking and well respected by all. Even though a polar bear and a black bear are very similar, however, they also have major differences. These differences help them survive in extremely different environments.

In the cold, frozen barren world of snow and ice surrounded the vast Arctic Sea lives the aggressive polar bear. Polar Bears have many physical features that help them survive in this hostile environment. Their fur is transparent which allows sunlight to penetrate their black skin, that absorbs light and converts it into heat. The whiteness of their fur allows them to blend in with their snowy surroundings. One of the most amazing things about a polar bear is its paws. These wide paws, have nonslip pads that enable them to travel over the snow and ice without slipping. Everything about a polar bear makes it perfect for a climate where very few animals can survive.

In the more temperate forest regions lives the much smaller, timid black bear. The black bear is considered to be the smallest bear in North America. But all black bears aren't really all black. Some have rusty-brown or gray fur mixed in with the black that helps them to blend into their surroundings of dark forested pines. Its smaller size helps it to climb trees to remove birds ' eggs and get honey from beehives. Whether the black bear knows it 's small or just because it is timid, it avoids being seen and stays hidden in the foliage of the woods. However, the black bear does have very sharp claws and teeth that can rip open tree stumps and tear branches off trees. Black bears are definitely more suited for the forested woodlands. The black bear would not be comfortable going to visit his polar bear cousins up North.

Poem in Modified Diamante Format

polar bear
gigantic furry white
prowling in the arctic wasteland
hunting eating sleeping
hiding in the darkened forest
timid agile
black bear

Modified Diamante Format Used for Poem Above

noun
adjective adjective
phrase beginning with participle*that describes what they do and
where they do it
participle participle participle
phrase beginning with a participle that describes what they do and
where they do it
adjective adjective
noun

*A participle is an action verb ending with "ing "

Bibliography

This lesson is part of the Fifth Grade Science Teacher Resource Book (TRB3)

<http://www.usoe.org/curr/science/core/5th/TRB5/>. The TRB3 is designed to be your textbook in teaching science curriculum to your students. This book covers all the objectives of each standard and benchmark. If taught efficiently, a student should do well on the End-of-Level (CRT) tests. The TRB3 is designed for teachers who know very little about science, as well as for teachers who have a

broad understanding of science.

Authors

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