

Ready-To-Go Lessons from BioEd Online

Mimicry and Camouflage

Organisms use many different strategies to avoid predators or to deceive potential prey animals. Some organisms have evolved outer appearances and behaviors that allow them to blend in or match with part of their surroundings. This strategy, known as camouflage, is employed, by many species. The familiar walking stick, for example, has an angular, twig-like appearance and can remain stationary for long periods of time to escape detection by possible predators. Some organisms even change colors to match their environments. The snowshoe hare develops a seasonal white coat in winter to blend in with snow and reverts to a brown coat each spring. The green anole, a tree-dwelling lizard native to the southeastern United States, changes colors from green to yellow to brown depending on its immediate surroundings. Anoles eat small insects, so their coloration makes them almost invisible to their prey and protects them from predators. Other examples of camouflage can be found among beetles, caterpillars, snakes, moths, frogs and grasshoppers.

Another tactic is to mimic or appear similar to another organism or part of an organism. For example, the viceroy butterfly, which is very tasty to birds, protects itself by mimicking the appearance of the foul-tasting monarch butterfly. This type of mimicry, where one species mimics another that is distasteful or armed with spines, stingers or toxic chemicals (such as snake venom), was first described by the English naturalist, Henry Walter Bates. Bates studied butterflies in the Amazon during the nineteenth century. Another kind of mimicry involves having one body part that imitates another body part in order to increase survival. Many butterfly and fish species have large eye spots that can be flashed rapidly to surprise a predator. This type of mimicry, sometimes referred to as self-mimicry, also can be used to lure prey. For example, the alligator snapping turtle has a worm-like appendage on its tongue that tempts passing fish to come a little closer.

Title

Mimicry and Camouflage

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Objective

The learner will be able to distinguish between mimicry and camouflage.

The learner will identify adaptations found in different organisms that illustrate specific survival strategies.

National Education Science Standards

- Characteristics of Organisms:
 - Each plant and animal has different structures that serve different functions in growth, survival, and reproduction.
- Organisms and Their Environment:
 - An organism's patterns of behavior are related to the nature of that organism's environment.

Audience/Time

- Grades 2 -5
- Two 45-minutes class periods

Materials/Preparation

1. Photographs of the monarch butterfly
Photographs of the viceroy butterfly
See <http://www.forestryimages.org/> , enter “butterfly” in search field
2. Different photographs of various animals that use mimicry (see list below).

Examples of Mimicry (see internet for images)

Hawk moth caterpillar and snakes
Drone fly and wasp
Red milk snake and coral snake
King snake and coral snake
Longhorn beetle and ants
Viceroy butterfly and monarch
Owl butterfly and eyes of a predator, such as an owl
Pacific gopher snake and rattlesnake

3. Different photographs of various animals that use camouflage (see list below).

Examples of Camouflage (see internet for images)

Polar bear blends with snowy environment
Copperhead snake and fall leaves on ground
Walking stick and branches of shrubs and trees
Lion and yellow-brown grasslands of Africa
Dark back of a fish and light underbelly (This is called countershading. As a predator looks down into the water, with the light behind them, the water appears dark and the fish blends. Conversely, if the predator is looking up toward the surface, the water is lighter and the belly of the fish blends with the surroundings.)

4. *Nature News* article, *Jellyfish Capture Prey With Crimson Bait*, found on BioEd online at: <http://www.bioedonline.org/news/news.cfm?art=1888>
5. Down load T-Chart PDF and make a transparency (or draw chart on the chalk board).

Lesson

Engage

1. Give each group of four students a pair of photographs (one each of a viceroy and monarch butterfly; see <http://www.naturalplanet.org/lessons/monarch-viceroy.htm>).
2. Have student groups discuss how the butterflies in the photographs are alike, and how they are different.
3. As a class, create a T-chart of similarities and differences between the two butterflies.

(Note: A T-chart is a type of graphic organizer to help organize thoughts and show relationships. In this case, it will show how a monarch butterfly and viceroy butterfly are alike, and how they are different.)

4. Discuss the meaning of mimicry. Explain to students that butterflies are often eaten by birds. The monarch is foul-tasting or poisonous to birds, while the viceroy is not poisonous or foul-tasting. Ask students, *Which butterfly is mimicking the other? Why?*

Explore

1. Give each group of students photographs of animals that mimic another organism in order to gain some type of advantage, or special help to survive in its environment.
2. Ask each group to examine the photographs and decide:
 - a) Is the animal mimicking another organism? If so, what organism? What is the advantage?
 - b) Does the animal possess a structure, coloration, or pattern that mimics another type of organism or part of an organism? If so, what is it? Why is it an advantage to the organism?

Explain

1. Each group will share their group's findings about one of the photographs they received. Discuss each one as a class and reach consensus on all the organisms in the photographs.
2. Read or summarize the *Nature News* article, *Jellyfish Capture Prey With Crimson Bait*, found on BioEd Online: <http://www.bioedonline.org/news/news.cfm?art=1888>. Ask, *Is this article is describing a form of mimicry?* (This article describes a jellyfish with a tentacle that "mimics" a type of food for deep sea fish. The tentacle is used is to lure the fish close to the jellyfish so that it can capture the fish as its own food.) Discuss this article as a class. Ask if any students can think of similar examples?

Elaborate/Extend

1. Review the meaning of mimicry with the class, and introduce or review the term, camouflage.
2. Discuss how camouflage and mimicry are different, and how they are alike. For example, both camouflage and mimicry provide an advantage for an organism, and both involve the organism copying either another organism or part of its environment. The primary difference is that, with mimicry, an organism copies another organism or part of an organism, while camouflage involves the copying of some part of the environment.
3. Distribute (or have students locate and bring to class) pictures of animals that mimic other organisms and animals that use camouflage in their environments. Have students create a T-chart showing which animals exhibit mimicry and which employ camouflage.
4. Ask groups to share the information on their T-charts with the class and explain how they decided which animals to put into each category.

Going Further

Based on students' prior knowledge of animals, have them each create their own animal that relies on either camouflage or mimicry to ensure survival. Then have students present their animals to the class.

Additional References

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Science Education Leadership Fellows Program
Funded by the Howard Hughes Medical Institute