Nature's Patterns

Grade: K

Subject Areas: Life Science, Mathematics, Investigation and Experimentation

Skills: comparing, counting, role playing, hand-eye coordination, modeling, observing

Duration: 1 hour

Connections: math, performing arts, art, food, survival, wildlife

Vocabulary

camouflage	habitat
predators	bobcat
polar bear	cougar
black bear	prey
brown bear	cub

Objective:

Students will learn how patterns, like camouflage, allow animals to fit into their environment. They will learn this through story telling and a hands-on investigation.

Materials

- a children's story about animal patterns
- 12 x 16 colored pieces of paper
- pictures of camouflaged and non-camouflaged animals from different habitats
- flip books on animals and plants
- red and green toothpicks
- green table cloths or a green lawn
- whistle or bell
- collection container
- Toothpick Recording Sheet (attached)
- paper animal masks (optional)
- face paint (optional)
- portable white board or other flat surface

Standards

Strands: Excellence in Environmental Education Guidelines
Strand 1 — Questioning and Analysis: A) Questioning: Learners are able to develop questions that help them learn about the environment and do simple investigations. **E) Organizing Information:** Learners are able to describe data and organize information to search for relationships and patterns concerning the environment and environmental topics.
F) Working with models and simulations: Learners understand that relationships, patterns, and processes can be represented by models.
Strand 2.2 — A) Organisms, populations, and communities: Learners understand basic similarities and differences among a wide variety of living organisms. They understand the concept of habitat. **C) Systems and connections:** Learners understand basic ways in which organisms are related to their environments and to other organisms.

California State Educational Standards:
Life Sciences (LS): 2a: Students know how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g. seed-bearing plants, birds, fish, insects).
LS 2b: Students know stories sometimes give plants and animals attributes they do not really have.
Investigation and Experimentation (I and E): 4b: Describe the properties of common objects.
4d: Compare and sort common objects by one physical attribute (e.g. color, shape, texture, size, weight).

Background

Perfected Patterns

Most young students have an avid imagination. Many books, TV shows and movies portray plants and animals in ways that are "far out" and unrealistic. In nature, there are some plants and animals that are "far out" too, but they are not from someone's imagination, they are real. Various patterns may be forms of advertising or concealing one's self. In this lesson, students will begin to understand how certain patterns help animals blend into a particular habitat. A **habitat** is the place an organism lives.

Patterns can help animals hide or hunt. A **predator** is a hunter and the animals that are eaten are called **prey**. **Camouflage** is any coloration, body shape, or behavior that helps an animal hide. Whether an animal lives in a tide pool, a river, a forest, or a meadow, examples of camouflage abound. For instance, fish can be darker on top and lighter on the bottom. This helps them match the different levels of light in water. If a predator is looking up into the sun to search for prey, a lighter color is harder to spot. This pattern is also observable in other aquatic life forms like frogs, toads, and turtles.

Some animals have the ability to adjust their coloration by special cells in their skin called chromatophores. Octopus, squid, and frogs are examples of animals with these cells. A common frog that lives in California is the pacific tree frog. This frog can come in a variety of colors from brown to light green depending on the habitat in which it lives. Some lizards and snakes have this ability too. If a lizard lives around dark colored rocks, there is a good chance it will have darker colored skin compared to one living around light colored rocks.

Patterns on the backs of some animals especially insects can match their habitat almost exactly. Blending in is a natural form of hide and seek. For example, you may not be able to see a grasshopper or a cicada in its natural habitat unless it moves. Some insect larvae that live in streams make little houses out of sticks and stones to hide in, as in the case of caddis flies.

If an animal is bright and easily seen, it may be poisonous. Several species of orange and yellow butterflies like the monarch butterfly and many topical species are examples of this. Because they are poisonous, they don't need to hide.

Comparing similar animals, like bears, in different habitats is one way to introduce adaptation to students. **polar bears** are white and live in the Arctic where most of the year it is covered by snow. Their white color allows them to blend into the white landscape. Often polar bears use the act of surprise to catch their prey. They may sit for hours waiting for just the right moment to pounce on a seal hidden below the ice. Only one species of bear lives in the King Range National Conservation Area (NCA), the black bear. **Black bears** are omnivores and don't attack people. Its common name, black bear, can be

Local Connection

One of the most amazing camouflaged animals found along the pacific northwest coast is the giant pacific octopus. This species lives from Southern California to Alaska where it is fished for food. This species is the largest octopus in the world and can get up to 600 pounds although it is more commonly 80-100 pounds. They are highly intelligent creatures and can even solve mazes. The skin of octopus along with their relatives like cuttlefish, have the ability to change color quickly. In moments they can change the color and texture of their skin to blend in with any environment like coral and rocks. The giant pacific octopus has a reddish brown body called a mantle. It changes the color of its skin when it hunts for prey like shrimp, scallops, abalone, and fish. Octopus are agile hunters. They have eight strong arms and no bones which allows them to squeeze through narrow cracks when hunting or escaping. They use a hard beaklike mouth to tear open the hard shells of their favorite prey.

misleading because black bears can come in a variety of colors including brown, blonde, and black. Some are even multi-colored. Black bears tend to be forest dwellers and don't ambush their prey like polar bears do. Another bear that lives in North America is the brown bear. **Brown bears** are also called grizzly bears. They are more aggressive than black bears, and might even attack a black bear. Like the black bear, they can be multi-colored. Many small animals hide from big predators like bears these include gophers and other rodents.

Spots and Stripes

Another group of predators many students love are wild cats. In North America, there are several species including the ocelot, jaguar, **bobcat** and **cougar** (mountain lion). Young cats or cubs, are the most vulnerable. **Cubs** have spots to help them hide. They may be left in a den while the female goes out and hunts. Both bobcats and cougars live in the King Range NCA. They are most active at dawn and dusk. Ocelots and jaguars stay spotted into adulthood which allows them to blend into the dense sub-tropical and tropical forests where they prefer to live. Both bears and cats are predators. Their markings allow them to not be seen easily.

Other animals with spotted babies include deer and several bird species like the California quail. Both of these species hide their young. Even a bird's eggs can be camouflaged. In local rivers, salmon, trout and pike minnows all have spots along the sides of their body. In the ocean, the variety of spots and stripes seem endless. A lot of animals hide in the crevices of rocks, under the sand and in the tangled world of algae. Spots and stripes are just a few patterns that help an animal blend in with its environment.

Camouflage is just one way an organism might avoid getting eaten. Nature has other patterns that help with survival too, such as, mimicry. Mimicry is when an animal or plant looks like something else. For example, many flies look like bees. Bees sting and if you look like one, predators may not bother you because they don't want to get stung. Some non-poisonous plants have evolved to look like poisonous ones to avoid getting eaten as well. In the tropics, there are insects that look like sticks. On the wings of some moths and butterflies, wing spots look like big eyes.

The patterns that we see in nature can tell us a lot about the ways plants and animals struggle for survival. Where something lives, what it likes to eat, and what likes to eat it, are all factors determining what a species looks like. The story behind the patterns of nature is truly fascinating.

Activity 1: Animal Patterns

Preparation

This activity is an introduction into animal patterns and the relationship between predator and prey. No prior preparation is necessary.

Materials

- a children's story about animal patterns (recommended books include: *What Color is Camouflage?* by Carolyn Otto and *Brown Bear, Brown Bear, What Do you See?* by Bill Martin)
- 12 x 16 colored pieces of paper (brown, tan, green, white, blue, etc.)
- pictures of camouflaged and non-camouflaged animals from different habitats
- flip books on animals and plants

Procedure

1. Gather all of the students around and begin to explain the differences between predators and prey. Explain how some animals have to hide in order to hunt, while others have to hide so they are not found.

2.Write predator and prey on the board, and have the students come up with examples of animals that fit into both categories. Having them make sounds or act out behaviors of both predators and prey is a good way for them to learn about their differences. For instance, the students can growl like a cat and show teeth and fingernails; or wince like a scared rabbit.

- *Who has played hide and seek?*
- *Do you think animals have to hide sometimes?*
- *Why do you think animals may have to hide?*
- *What is a way patterns can help an animal hide?*
- *What patterns do we see on some animals?*
- *What is a kind of local animal that has camouflage?*

3. Gather the students into a reading area and introduce the idea of camouflage by reading a story about it. Use the story to point out which patterns on animals are real and which are not. Continue to discuss and identify which animals are prey and which ones are predators. You may also want to identify different places or habitats that emerge in the story.

4. Next, define the word camouflage. Ask them what letter "camouflage" starts with. Say the word camouflage several times and have the students clap to it and repeat after you. Finish up by showing pictures of camouflaged animals in different habitats (see attached pictures).

5. Hold up a white piece of paper and have them tell you what animals could be hiding here (polar bear, snowshoe hare, arctic fox, etc.). Repeat for the blue (bluebird, whale, blue fish, etc.), green (frog, grasshopper, garter snake, etc.) and brown (brown bear, brown squirrel, cricket, etc.) construction paper. Instead of using paper you may want to go online to camouflage field book at: http://www.harcourtschool.com/activity/camouflage/camouflage.html which shows different habitats.

6. Another option is to have the students circle which animals are camouflaged on a piece of paper showing both (see attached). As students finish this exercise, have them assemble their animal masks in preparation for the next activity or paint on simple whiskers.

Activity 2: Hide and Seek

Preparation

Put the red and green toothpicks into two different containers and label them "red" and "green". These will be counted before and after. If possible, have the students make predator masks ahead of time.

Materials

- green table cloths or a green lawn
- red and green toothpicks
- whistle or bell
- collection container
- Toothpick Recording Sheet (attached)
- paper animal masks (optional)
- face paint (optional)
- portable white board or other flat surface

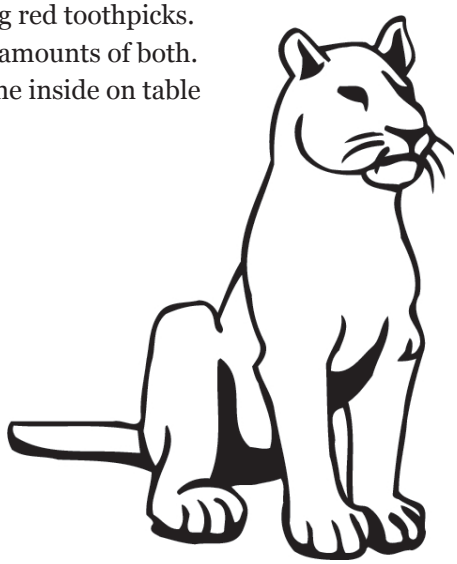
Procedure

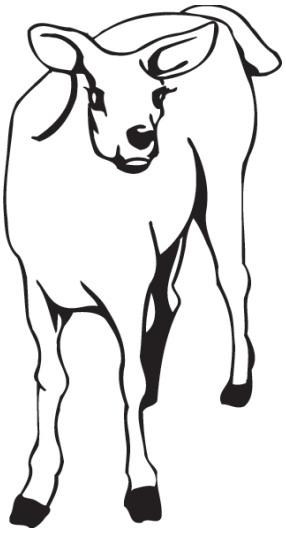
1. With weather permitting, take the students outside onto a lawn or mowed field. Have the students sit in a circle and tell them that they are going to take the role of predators. Their food in this case is toothpicks. To add some fun, have the students wear simple face paint, like whiskers or put on a simple paper animal mask (see examples).

2. Explain to the students that this exercise can be used to show how patterns like camouflage works in nature. Toss all of the green toothpicks onto a small white board or other flat surface. Together count how many there are. Record this amount on the Toothpick Recording Sheet (see attached). Next, do the same thing using red toothpicks. There should be equal amounts of both. This activity can be done inside on table cloths as well.

3. Next, explain how the activity will work. Set some clear rules like no pushing or shoving. The students need to keep all of their toothpicks in their hands until time is up. Have a way of giving a signal for when to start and stop.

4. Throw out all of the toothpicks and give them 30 seconds to collect as many as they can. Afterwards, you need to collect their toothpicks into a container like a bucket. Together count how many of each colored toothpick was found and record the count on the data sheet (see attached). Usually more red toothpicks are found than green because green "hides" better. Repeat the activity three more times. Discuss the results with the children.





Extensions

- Look at other animal adaptations like fur, fins, and feathers.
- Make animals out of simple materials like toilet paper rolls.
- Bring a live animal into the classroom and discuss what animals need to survive.
- Role play other animal behaviors such as digging with claws or swimming through water.
- Make an alphabet book using plants, animals and other things found in nature.

References

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Giant Pacific Octopus, http://www.npca.org/marine_and_coastal/marine_wildlife/octopus.html, 2011

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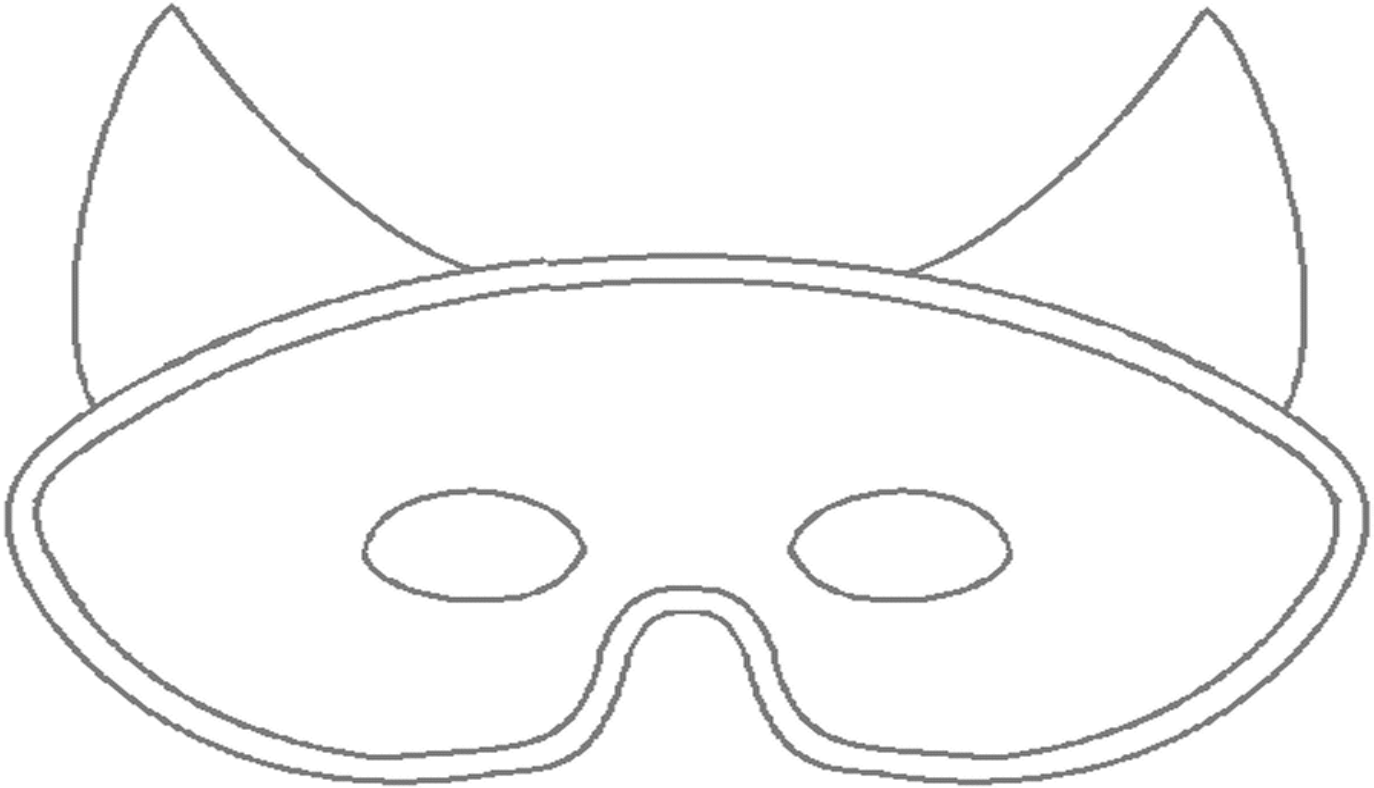
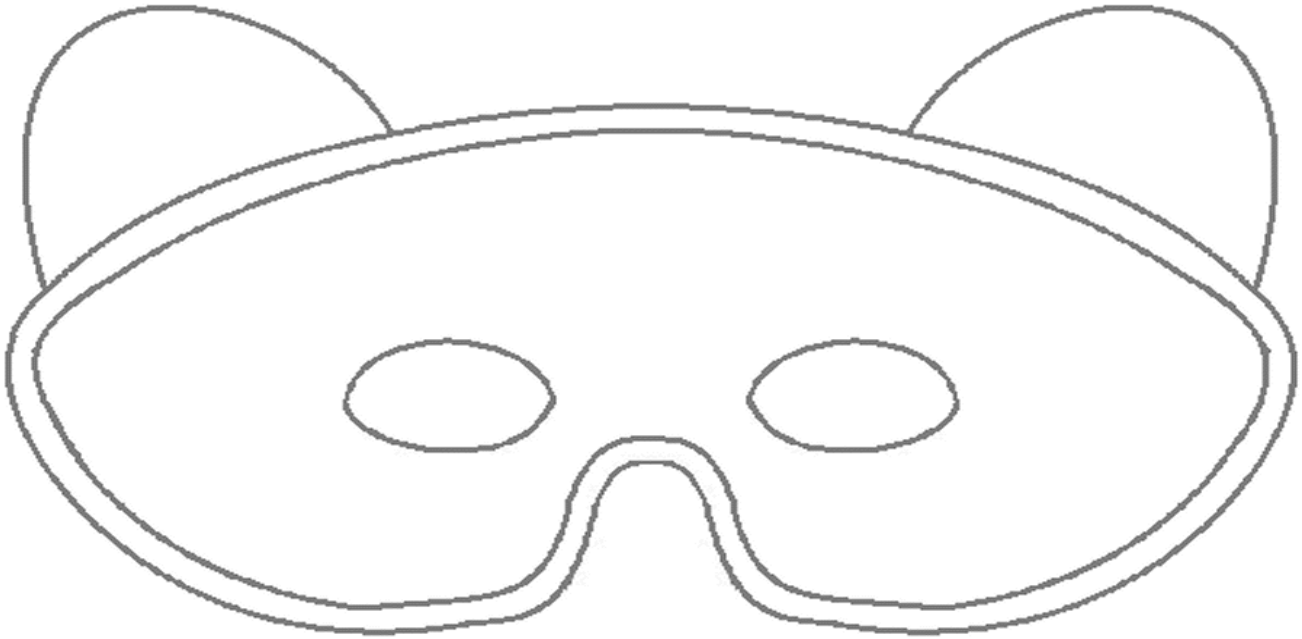
Color Book Mask



Color Book Mask



Name: _____ **Date:** _____

Camoflauge Activity

Circle the animals that are using camoflauge.

http://www.lessonplanspage.com/printables/PScienceLACamouflageSortingActivityK2.htm

Name: _____ Date: _____

Toothpick Recording Sheet

	Number of Red Toothpicks	Number of Green Toothpicks
In Classroom		
After 1st Toss		
After 2nd Toss		
After 3rd Toss		
After 4th Toss		

from: http://alex.state.al.us/lesson_view.php?id=13748

Name: _____ Date: _____

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