

# Who's Hiding There?

Lesson by Phyllis Schmitt, Santa Rosa, CA  
Adapted from "Camouflage" in Water Birds,  
ORCA written by Barbara Williams

## Key Concept

1. Various forms of camouflage and disguises based on shape, color and behavior are important to the survival of water birds and shorebirds.



## Background

Concealment by camouflage or disguise is essential to the survival (predator and prey alike) of most animals including water birds and shorebirds. It either serves to protect a bird from predators or to conceal a predator from prey. There are three basic types of protection:

1. **camouflage** - the animal's shape and outline is broken-up by lines, spots or color so that it merges with its habitat background and is difficult to see.
2. **disguise** or mimicry- the animal mimics a specific part of its environment such as an **inanimate** object like a twig or rock that has no food value for the predator or does not frighten a prey.
3. **hiding** is another form of disguise. Animals or objects that are hidden are those that are out of sight. When camouflaged or disguised, the bird is within full view of its prey/predator. Shorebirds and water birds hide, but more often they rely upon mechanisms of camouflage, such as color and shape, for successful concealment.

### Color and Shape: Cryptic Coloration

Color, shape or a combination of both are the most common forms of camouflage. An object that blends in with the color of its background is said to have **cryptic coloration**. An example of this is the Killdeer, a type of plover. It builds its nest by hollowing out an area in the open ground. It would seem to be an easy task to find the exposed eggs, but the splotches and tan color of the eggs cause them to merge with the background soil and surrounding pebbles. Plover eggs and chicks resemble the shape of the rocks, stones and pebbles upon the beach. Thus, the elements of color and shape are combined to conceal them from hungry predators such as gulls and crows.

### Disruptive Coloration

Disruptive coloration is a type of camouflage that depends upon color splotches, dots and lines to break up the outline of a shape. Predators and prey learn to recognize the shape and behavior of a food source or potential danger. This is called developing a “search image.” The disruption of the “search image” through the mechanisms of camouflage are important to the survival of a species. Birds, nests and eggs that are exposed during the day have the most highly developed camouflage techniques. They conceal their body shape/outline by breaking up its identifying lines while also relying heavily upon the camouflage elements of shape and cryptic coloration.

### Appropriate Behavior

Successful camouflage is usually a combination of color, shape and the appropriate behavior. A Killdeer chick may exhibit cryptic coloration, but if it runs around the beach it is sure to attract the eye of a hungry predator. Therefore, Killdeer chicks usually remain motionless until danger has passed. They also squat on the ground which eliminates their shadows. The shadow outline can be a direct give-away as to the presence of a chick. The American Bittern, a shy, rather large heron-like bird which inhabits lakes and marshes, adopts a unique camouflage technique that combines shape and behavior. It will stand among the tall grasses at the edge of the water and mimic their shape and motion by stretching its long, light tan neck skyward and swaying to and fro with the blowing grasses.

### Countershading

Water birds which spend most of their time swimming or diving, usually have light colored undersides and darker colored heads, necks and backs. For predators foraging beneath the water (otters and seals), the light bellies merge with the lighter waters or sky above. For predators that fly or forage from above (e.g., hawk), the darker colors of their backs, necks and heads blend with the darker water or bottom. For predators looking sideways at a swimming bird, the light/dark shading makes the object look flat and therefore more difficult to locate.

### Seasonal Coloration

The color of certain birds' plumage (feathers) changes from summer to winter reflecting changes in the birds' behavior or habitat. Some birds that spend the winter in snowy regions will turn white in winter but brown in summer when they are no longer surrounded by a snowy white background. The male Mallard Duck loses his dashing coat of green, white, rust, brown and black during the months of July and August. At this time he molts (loses his old feathers and grows new ones) and he is unable to fly. Because of this he is vulnerable to predators and must rely upon good camouflage as an escape. His plumage becomes a dull brown and resembles that of the female Mallard. Most female bird species have dull plumage which is especially crucial for protection during the long nesting period.

## Materials

For the class:

- 10 items camouflaged in the room or outside
- overhead transparencies A - D

For each team of two students:

- copies of “Camouflage Search List” (A list of the 10 camouflaged items.)

## Teaching Hints

This activity introduces the concepts of hiding and camouflage. **To hide means to be out of sight. To camouflage means to remain in full view but blend with the background.** Stress these concepts in the discussion.

### Preparation - Before Students Arrive

Place 10 objects around the classroom or outside so that their colors and/or shapes blend with their backgrounds. Take care to **camouflage** and not **hide** the objects.

Examples:

- a red pencil on or against a long piece of red paper (example of color and shape blend)
- a pink eraser on a pink book cover (example of color only blend or camouflage)

1. Display an object like a red pencil. Ask them what you need to do to hide it. Lead the discussion to the idea that objects that are hidden are out of sight.
2. Use the same object (like a red pencil) and place it first on a white sheet of paper, then on a sheet of red paper. Ask students to explain which paper/pencil combination made the pencil easier to find.
3. Help students develop the definition of camouflage, using the examples of the paper/pencil combinations. Encourage students to recognize the elements of shape and color as they relate to camouflage.
4. Explain there are 10 camouflaged objects distributed in the room (or outside). Hand out the “Camouflage Search List” with the names of the objects to each team. Tell students they will be searching in silence for the items and that they are not to touch or remove objects which they find. Send them on a scavenger hunt for a maximum of 5 minutes to search.

5. After 5 minutes of hunting, display the list of camouflaged objects. Ask students how many found object number 1. Count and tally. Continue counting and tallying through all 10 objects. At the end of this you'll probably find that some objects were found by most students, and some objects were found by only a few students. Discuss the reasons for this.
6. To expand students' understanding of the elements of camouflage (color and shape together with appropriate behavior) use transparencies A - D:
- Place transparency B over A with the cattails camouflaging the Bittern. Turn on the overhead projector. Ask students to describe what they see.
  - Remove transparency B. Have students summarize observations.
  - Display transparency C (chicks and nest/eggs). Ask questions like:

**What do you see?**

**How are these chicks and eggs camouflaged?** (color and shape)

**Compare the two chicks. Which is better camouflaged? Why?**  
(The chick with the shadow is more visible because your eye moves right to the dark area.)

**How could the chick eliminate its shadow immediately and without hiding?** (squat)

Discuss with students the idea that appropriate behavior enhances the success of camouflage. Plover chicks squat and remain motionless to avoid attracting the attention of a predator. The American Bittern (place Transparency B over A) moves its out-stretched neck to and fro with the blowing cattails.

- Place Mallard Duck Transparency "D" on the overhead projector. Ask students to find the two Mallard ducks in the picture. Ask which is more visible? (male, standing up)

Explain that the Mallard male duck resembles the female Mallard ducks' coloring during July. The males molt at this time and cannot fly. Ask:

**What advantage is there to resembling the dull brown coloring of the female at this time?** (Escape from predators through successful camouflage.)

Emphasize the importance of camouflage for water birds and shorebirds. They spend a good deal of time in relatively exposed areas such as open water or along the water's edge where there is no place or time to hide. It is safer to remain motionless and rely on good camouflage.

7. Students may want to discuss experiences they have had with camouflaged nests, birds, etc.

## Key Words

**camouflage** - a behavior, shape, coloration and /or pattern that helps a plant or animal blend in with its surroundings

**shorebird** - any of various birds, such as a sandpiper, plover or snipe, that frequent the shores of coastal or inland waters

**water bird** - a swimming or wading bird

## Extensions

### 1. Camouflage a "Bird"

Have all student teams start with a common object (like a stone painted white or an egg; plastic or real) and challenge them to camouflage their object in assorted "habitats." This activity has also worked well using sugar cookies and white frosting, dyed with food coloring, to match a "habitat" of colorful wrapping paper.

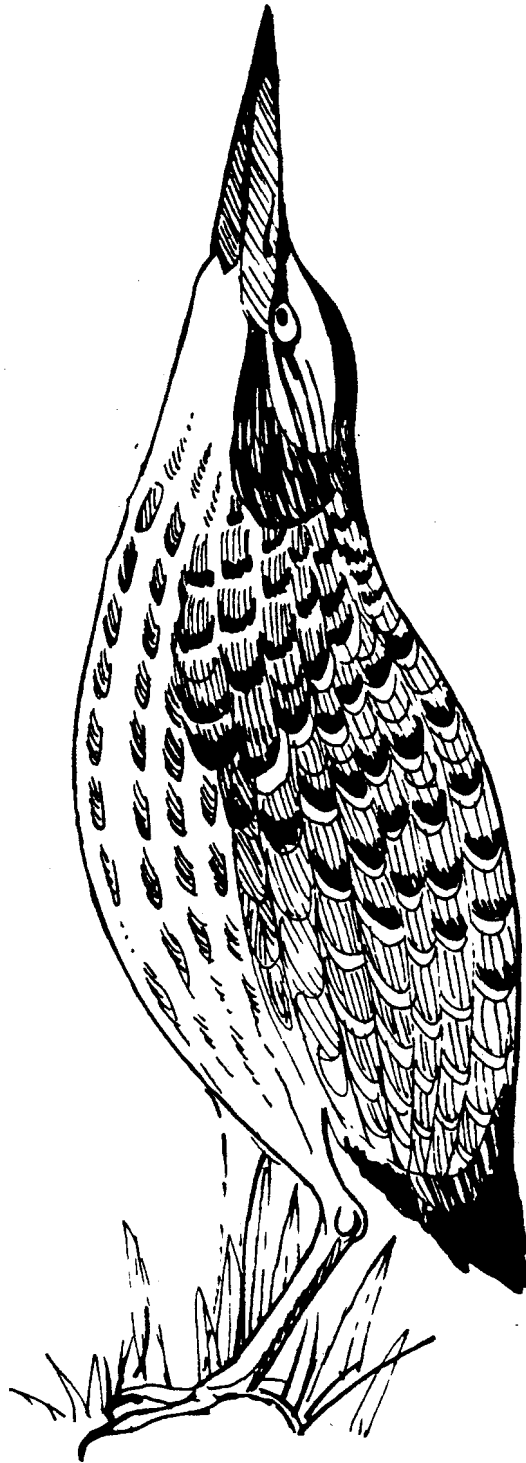
At the end of the creating period, gather the class together. Choose one habitat to visit at a time. Go from habitat to habitat as a group. The habitat groups being visited can be the "prey" and the rest are the "predator". Give each "predator" group a set time (2 - 5 min.) to find the prey. At the end of that time gather the groups together and walk to each camouflaged "bird" that was found.

### 2. Camouflaged Snack

- a. Prepare enough trail mix for the class (a mixture of multi-colored M&M candies, raisins, nuts, etc.)
- b. Give each student a small sack of trail mix.
- c. Invite them to separate all the M&Ms from the trail mix within a 1-minute span of time.
- d. Record how many of each color was found.
- e. Check to see how many of each color was left in the sack. Usually there will be more brown M&Ms left among the brown nuts and raisins. Ask students why this is so. (They are more difficult to see due to camouflage.)

"Who's Hiding There?" springs from ideas originally appearing in the activity "Camouflage" written by Barbara Williams at the Pacific Science Center in cooperation with the Washington State Sea Grant and the Office of the Superintendent of Public Instruction and copyrighted by the Pacific Science Center in 1980.

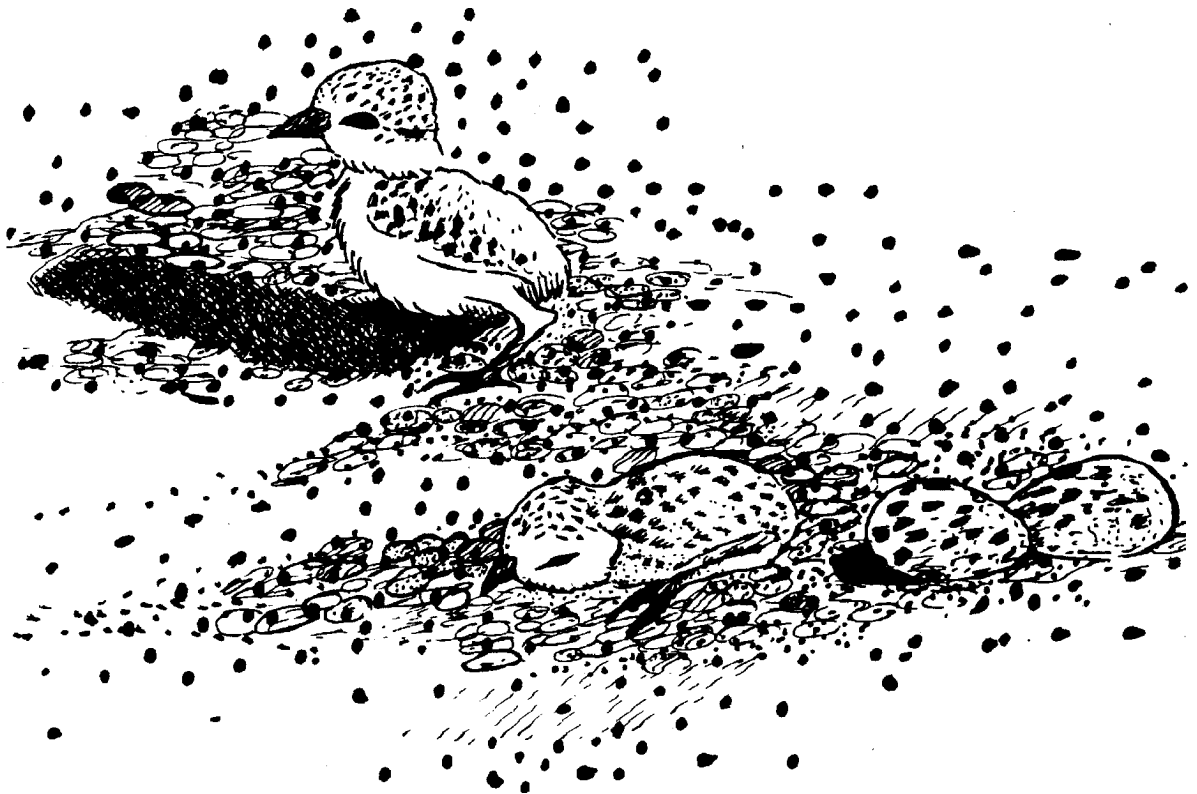
Transparency A Bittern



### Transparency B Cattails



### Transparency C Plover Chicks





### Transparency D Mallard Ducks

