Tom Greer

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Left: White-tailed Kite. Right: Great Horned Owl.

First Flight with Raptors

Birds of prey are fascinating "hooks" for teaching basic biology concepts and arousing young students' interest in the natural world

by **Gail Hall**

WITH YOUNG STUDENTS, imagination plays a critical role in learning, so that finding something that captivates the imagination is key to engaging minds. As top predators, birds of prey ignite the imagination and make a great biology "hook" for students. Teachers can use their students' interest in and curiosity about birds of prey as a gateway to asking all kinds of questions about the natural world.

The following activities introduce kindergarten students to basic biology concepts (biodiversity, habitat, form and function, and food chains), using birds of prey as an engaging focus for learning. The activities are designed for indoor use and are inquiry based. They do not focus on facts, but rather on simple questions about animals in general and raptors in particular: In what ways are some animals similar? In what ways are they different? Why? What do these differences or similarities tell us about how the animals live? During each activity, students gather information by observing and exploring. They then communicate their observations to their classmates and teacher, and go on to apply the new information in new situations. A pre-activity is included to enable the teacher and the students to compare their pre-existing knowledge about raptors with their performance in the final activity. The activities meet U.S. national science standards for K-4 science content[1] and have been field tested in kindergarten classes ranging in size from 11 to 22 students. They may be just the "hook" you are looking for to spark your young students' interest in the natural world.

Pre-activity: Imagine a hawk

This pre-activity allows the teacher to find out what students already know about birds of prey (what they are, where they live, etc.) and provides a baseline for the final activity, in which teachers and students evaluate conceptual changes resulting from the series of activities. Do this activity two days before you engage in activities 1 through 4.

Materials: Paper, pencils, and crayons for drawing and writing.

Procedure: Ask the students to draw what they think a hawk looks like. Have them include in their drawings a background that represents an environment where a hawk might live (its habitat). Some students may want to include a written description to go with their picture. Do not describe a hawk to the students; if they are not certain what a hawk is, encourage them to use their imaginations. Hang the finished drawings on the wall for display during activities 1 through 4, which are to be done two days later.

Activity 1: What is a bird?

Through this activity, students learn how to distinguish birds from other types of animals by identifying the unique physical characteristics of birds.

Materials:

- Laminated photographs of different birds (e.g., ducks, geese, gulls, songbirds), one per student. (See page 27 for photograph source.) Do not include photos of raptors (hawks, eagles, falcons, kites, harriers, osprey, and vultures) as these birds are introduced in the next activity.
- Laminated photographs of reptiles, amphibians, mammals, and invertebrates.
- Feathers for passing around. You may be able to borrow feathers and bird specimens from a local nature center; otherwise, you may obtain poultry feathers from craft stores or poultry farms.

Procedure:

1. Organize the class into groups of four or five students.

2. Lay out the photos of animals from all of the major groups (birds, reptiles, amphibians, mammals, and invertebrates). Provide several photos of each type of bird.

3. Ask each group of students to look at the photos, and have each student pick out a photo of a bird.

4. Ask students to compare their birds with those selected by the other members of their group. Ask them to look for parts of the birds' bodies that all the birds have in common. Have the students share their observations with the class.

5. Once the students have discovered that all birds have feathers, beaks, and wings, pass feathers around if you have some. Give the students time to feel the feathers, to compare their textures, sizes, and shapes, and then to share their observations. Collect the feathers.

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Top: A student demonstrates to the class that all raptors have keen eyesight, a hooked beak, and powerful talons. Bottom: Students share information about where they have observed raptors by placing raptor cutouts on a drawing showing different habitats.

6. Instruct the students to compare their photos again, this time looking for differences in the birds' bodies. Allow time for them to share their observations with the class.

7. You may wish to explain to the students that the physical traits they have described — both the similarities and the differences — are called adaptations. Adaptations are behavioral or physical traits that help an animal to survive in a given habitat. All birds need beaks, wings, and feathers to survive, but some need smaller beaks, or more pointy wings, or different colored feathers to survive in the particular habitat in which they live.

Activity 2: Build a raptor

Through this activity, students learn to distinguish raptors from other types of birds and understand that raptors can be found nearly everywhere.

Materials:

- Photograph of a raptor.
- Small paper cutouts of raptors, some perched and some flying, one per student. (See page 27 for source of raptor illustrations.)
- Drawing materials and blackboard or large sheet of paper.
- "Build-a-raptor" props: big gag sunglasses or "eyeball" glasses; a beak made out of cardboard or foam with a band or strap for holding it on the head (having your students make their own beaks would be a fun project); talons made from small children's gloves (yellow, tan, or orange) with the pinky and ring fingers sewn together and the fingers painted black.

Procedure:

1. Have the students make a large class drawing of your town, either on the blackboard or on a large sheet of paper. Ask them to include woods, fields (farms and parks), residential areas, the town center, streams, rivers, and lakes. You may want to have them make the drawing a day or two in advance (perhaps on the same day as the pre-activity), so that it is ready for use during this activity. Hang this drawing where everyone can see and reach it.

2. Show the students a photograph of a raptor and ask them if it is a bird. Discuss how they recognized it as a bird (reinforce that a bird has feathers, wings, and a beak). Ask if anyone knows what kind of bird is in the photo. Explain that raptors are birds that eat other animals (prey) and capture their prey with their feet (talons). (Note that vultures do not

capture prey with their feet but they do have talons and are considered raptors.) All raptors have some unique body parts (physical traits) that make them very good at finding and capturing prey.

3. Ask a student volunteer to "become" a raptor. Have this student dress up as a raptor with large eyes (for detecting prey), talons (for capturing and killing prey), and a hooked beak (for eating prey). Alternatively, prepare enough props for everyone to become a raptor. Explain each feature as you build the raptor. Make the process funny and light-hearted.

4. Conclude by asking your students to raise their hands if they have ever seen a raptor. Tell the class that you have seen raptors too, and name a place where you have observed one (e.g., in the woods, near the road, in the city, at the beach, on a farm).

5. Distribute the small paper cutouts of raptors. Ask the students to paste or tape their paper raptors on the large drawing of the town, placing their birds at a spot where they have seen a raptor (or a similar location). After the students have done this, talk about the types of places (habitats) where raptors are likely to be seen. The main point is that raptors can be found nearly everywhere.

Activity 3: Raptors and their prey

This activity helps students understand that raptors eat many different kinds of animals.

Materials:

- Raptor cards, each with a photo of a different raptor on the front and that raptor's preferred prey on the back, one card per student. (See page 27 for photo source.) Attach strings to the cards so that students can wear them around their necks.
- Prey cards, each with a photo that matches one of one photos of prey species shown on the backs of the raptor cards, one card per student. (See page 27 for photo source.)
- Build-a-raptor props (as used in Activity 2).

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Top: A student searches for prey for the American Kestrel during a game of "Raptor, Raptor, Prey." Bottom: Students compare the kinds of prey that different raptors prefer.

Procedure:

1. Hand out one raptor card to each student. Explain to the students that each is getting a photograph of a raptor and that on the back of the card there are photos of the animals that "their" raptor eats. Give the students some time to examine their raptor and its common prey.

2. Ask the students to compare the types of prey their raptor eats with the prey of other raptors in their group. After they have had some time to do this, ask them if all raptors eat the same prey. Then have them share with the class the different types of animals that raptors eat.

3. Have the students sit in a circle on the floor, wearing their raptor cards around their necks. Give one prey card to each student, and have the students place their prey cards on the floor in front of them.

4. Explain the meaning of the word *prey* (or reiterate the meaning if it was defined previously).

5. Explain the rules of the game "Raptor, Raptor, Prey." The object of the game is for a "raptor" to select from the circle of "prey" a prey animal that matches one on the back of his/her raptor card (this game is "Duck, Duck, Goose" with a slight twist). The student who is "It" dresses as a raptor and goes around the circle saying "raptor, raptor, raptor …." as it searches for its prey. When the raptor finds its prey, it taps that person on the head and says "prey." The prey then chases the raptor around the circle, and the raptor tries to sit in the prey's vacant spot in the circle before being tagged by the prey. Whether the raptor gets tagged or sits down before being tagged, the prey becomes the raptor in the next round (and the raptor becomes the prey in the circle).

6. Play the game until everyone has had a chance to be the raptor.

Activity 4: What we have learned

In this activity, students review their drawings and descriptions of raptors from the pre-activity, recognize what they have learned about raptors, and apply this new information by adding to or altering their drawings.

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Students share changes they have made to the original drawing of a raptor they made in the pre-activity.

Materials: Paper and drawing tools, the "Imagine a Hawk" drawings from the pre-activity.

Procedure: Give the students the drawings they made in the pre-activity. Ask them to think about how they might change their drawings or what they might add to them on the basis of what they have learned in the other activities. Distribute paper and drawing tools and allow the students to make changes or additions to their drawings or to make entirely new drawings.

Gail Hall is an education specialist at Hawk Mountain Sanctuary in Kempton, Pennsylvania, the oldest and largest member-based raptor conservation organization in the world. She thanks seasonal educator Lisa Schnell for initiating work on kindergarten-level learning activities focused on raptors.

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These activities were adapted from *First Flight*, a series of activities developed by Hawk Mountain Sanctuary in Kempton, Pennsylvania.

Note

[1] See National Research Council, *National Science Education Standards,* Washington, DC: National Academies Press, 1996. The activities meet K-4 science content standards in life sciences, science as inquiry, and unifying concepts.

Raptor Photo Sources

Hawk Mountain Sanctuary provides free CD-ROMs containing digital photos of raptors and their prey for use in Activities 1 and 3. The disk includes suggestions for several outdoor extension activities; background information on raptors; and a coloring book titled *Raptors of Hawk Mountain,* which has illustrations for making raptor cutouts for use in Activity 2. (The illustrations of raptors can also be downloaded from <www.hawkmountain.org/education/HMS_coloring_book.htm>. Click on "Color Examples.") To request a CD-ROM, contact Gail Hall at Hawk Mountain Sanctuary, 1700 Hawk Mountain Road, Kempton, PA 19529, hall@hawkmtn.org, or (570) 943-3411, ext. 107.