Environmental Education using Live Birds of Prey

Thank you to Xcel Energy Foundation and their Environmental Partnership Program

Predator/Prey Survival — Games People Play 101
(Suitable for K-12)

SIGHT HUNTING — CAMOUFLAGE AND NATURAL SELECTION

OBJECTIVE
To simulate a hunt for camouflaged animals using sight. To learn about the process of natural selection by discovering which prey survived the hunt to produce the next generation of their species.

TEACHER BACKGROUND
Prey species use camouflage as a way to protect themselves from predators. Sometimes the same species have different colors to better blend into their habitat. For example, the Eastern Screech Owl, which is both a predator and a prey of other animals, comes in two colors, also called morphs, gray or red. Scientists have noted that the red morph owls are more commonly found in the south where reddish pine trees are dominant. The gray Eastern Screech Owl is more commonly found in the north where the trees are predominantly grey, hard woods. These two Eastern Screech Owl morphs have evolved to use their natural habitats to their optimum advantage, using camouflage to hide from predators.

Natural selection is the process where animals that survive the obstacles in their environment, including predators, will be the parents of the next generation. The animals that survive this game will be those best adapted to their environment. In turn, they might pass off their characteristics, in this case color or camouflage, to their young.

The camouflage and natural selection game teaches students the importance of color and how animals evolve to hide from predators and better survive in their environment. The students must select which morph of a specific snake species has the greatest survival advantage based on the selected habitat.
MATERIALS
10 pieces each of different colored yarn, ribbon or thinly cut construction paper, approximately two inches long (use colors like red, blue, brown, green, yellow).
Stopwatch

GOAL
To determine which morph has a greater chance of survival in a selected habitat and therefore will go on to produce the next generation of snake.

PROCEDURE
1. Explain to the students how each color represents a different morph of the same snake species. Make predictions on which morph has a better chance of survival.

2. Select a green space or other habitat around your school. Scatter the different colored yarn, ribbon, or paper around the grass, bushes, trees and rocks. Make sure one of selected colors blends into the environment you have chosen, i.e., gray on rocks, green on grass, black on asphalt. Do not let the students see where you have placed the colored pieces.

3. Tell the students that they are hungry, large raptors looking for snakes and that their prey is hidden in your selected habitat.

4. Give the students five seconds to pick up as many snakes as they can. Count the number of prey found and the colors. Which colors were found the most? What will happen to these colored snakes over time if they do not evolve to better blend into their habitat?

5. Give the students another five seconds to find the remainder of the prey. What colors remain hidden? When the breeding season begins, who will be the parents and what morphs will the offspring most likely be?

6. Older science students, may want to play the game several times and graph or use percentages to describe their findings.

VARIATION
Change the habitat and play again. Which morph will be dominant in the new environment?
MIGRATION OBSTACLE COURSE

OBJECTIVE
To experience the many hazards of migration and understand why many birds do not survive the trip.

TEACHER BACKGROUND
Migration refers to the seasonal movement of animals from one region to another. Raptors (birds of Prey) that migrate face many challenges as humanity populates and develops the land for our own use. The Swainson's Hawk is well known for its long migration journey. This hawk flies thousands of miles each year from its summer home in North America to its winter home in Argentina, South America. Swainson's Hawks usually fly in large groups rising on thermals then gliding to the next thermal. Unfortunately, during the long migration the hawks encounter many natural and man-made hazards. Natural obstacles include high winds, fog, lack of food from droughts, heavy rain and predators. Man-made hazards include trees that have been cut down at familiar resting spots, pesticides, cars, electrical towers, lack of food from overgrazing, logging or development and new buildings.

MATERIALS
Large Area Marked Off by Boundary Markers
Hazard Signs (with string attached to hang around students' necks)

PROCEDURE
1. Discuss with class the many hazards encountered by a migrating raptor. Have the students brainstorm and make signs representing the hazards that they identified. Attach string to these signs to hang them around the students' necks.

2. Create a migration zone area marked off by tape, cones or other boundary markers. Have a few students pick a hazard and station themselves within the migration zone. The students with hazards signs must remain at a fixed spot and can rotate only on one foot to tag the migrating hawks.

3. Have the rest of the class line up at one end of the migration zone. These students will be Swainson's Hawks flying from their summer home in North America to the winter home in Argentina. They must cross the migration zone without being tagged by one of the "hazards." If tagged, they must lie down and "die."

4. How many hawks successfully completed the migration? Remember these same hawks must return to North America in the summer. How many of the surviving hawks make the return trip? How many hawks are left now?

5. Switch roles and replay the game with your class.

ADDITIONAL ACTIVITIES
1. Ask the students to identify how man can eliminate or lessen some of the hazards. Remove these from the game and play again. Did fixing some of the problems aid in the migration?

2. Make a passport on individual migrating raptors. Like human passports, include a picture, height, weight and other physical descriptions. Stamp the passport when the raptor is leaving its summer home and arriving at its winter destination. For older students, use maps with a well defined scale to figure out their individual raptor's migration routes and distances traveled. Share the findings with the class. Remember some raptors do not migrate or only migrate short distances.
HUNTING BY SOUND

OBJECTIVE
To experience hunting by sound.

TEACHER BACKGROUND
Nocturnal owls use their hearing to locate their prey. Scientists have noted that the Barn Owl has the best hearing of all the land animals and can locate its prey by hearing alone.

Most owls are silent hunters. Often the prey does not realize they are being stalked until the owl has landed on them. As defense, prey species often freeze when a predator is detected near them. Movement, and the sound it produces, often triggers the predator's attack. This "freezing" behavior can sometimes make the difference between life or death.

Students playing the"hunting by sound game" will learn how an owl uses sound to locate its prey. They will also learn how the prey might behave so the predator cannot find them.

MATERIALS
Blindfolds
Quiet Noise Makers (like crinkled paper or hand rubbing for mice)

PROCEDURE
1. Holding hands, have your class form a circle. The circle of students will be a ring of trees in the forest. Choose one student to be a hungry owl and several others to be mice.

2. Because it is a dark night in the forest, blindfold the owl and mice so they cannot see. Give your mice some kind of noise maker; this can be as simple as crinkled tissue paper or rubbing hands together.

3. Let the mice enter the center of the ring first and situate themselves for an evening of grazing for food. Then let the owl enter the ring. The owl must use his/her hearing to locate its prey and tag the mouse. To avoid running and bumping into each other, have the mice use all four of their "legs." Once tagged, the mouse can remove the blindfold and join the trees in the forest.

4. If mice are being caught too quickly, remember the trees in the forest also make sounds. Swish and sway to the evening breeze.

5. Repeat the game with a different set of students. Discuss with the students what it was like to be the prey species and how it felt to be the predator. What adaptations or behaviors did the prey use to survive? What adaptations or behaviors did the owl use to locate its meal?