BIRD BEHAVIOR TIME BUDGET
Learning Activity
California Coastal National Monument

Grades: 2-8, particularly appropriate for grade 3 learning standards
Length: one 30-minute observation session, 30 minutes graphing and sharing
Subjects: life science, math
Topics: adaptation, observation

Objectives
In this lesson students will:
- Discover that birds have a variety of behavioral adaptations that help them survive in their environment
- Practice problem solving by working cooperatively to determine the different ways and percentages of how birds spend their time
- Learn the technique of conducting a time budget and how to objectively measure behaviors
- Predict and test hypothesis on how birds spend their time
- Improve public speaking skills by presenting their conclusions and reasoning to classmates
- Verbalize and defend their opinions in front of their peers
- Appreciate off shore habitats as places where birds can practice a variety of behaviors

Introduction
On the coast of the Palos Verdes Peninsula, a phalarope is spinning in circles of shallow water. By doing this he is stirring up insect larvae, his next anticipated meal. Two oystercatchers face each other, forehead to forehead, and courteously bow to each other in courtship. On the shallow tide a dowitcher probes in the wet sand. Appearing like a sewing machine, its up and down repetitions guide him to worms and small crustaceans.

Adaptations are something a plant or animal has or does to help it survive in its environment. By watching birds in light of their adapted behaviors, students experience a showcase of ready and relevant actions that help the individual respond to its environment in a favorable way for its survival.

The joys of discovery and the appeal of understanding birds provide a rewarding experience for the observer. Any interested person can find birds to observe and study, whether they be in a tide pool, forest or even in an urban setting. Watching birds amply satisfies our curiosity about all animal life. While many “birders” merely observe a bird just sufficiently to get field markings for identification of the species, those who add notes on the birds’ behavior so discover that their observations conjure up provocative questions.

Once students become aware of the intriguing insight to bird behavior, students will be eager to ask new questions, an important stage of inquiry.

This lesson provides practical techniques for data input from a world that is often unobserved and ignored. Before teaching this lesson, read the entire lesson and make sure all materials are available, and find an observation site that is safe for student use and active with birdlife.

Background
In this lesson students learn how to observe and record how a bird spends its time. This recorded data is useful in answering the introductory question: How do birds spend their time? Since only the observable behaviors will be seen and recorded, not all activity will be considered. When presented with the challenges that birds face (such as acquiring sufficient food, finding a mate, defending territory, nest building, raising young and avoiding predation) one easily understands that the life of a bird is a complex one. When questions are designed to be more specific, such as Do male surf scoters act differently than females?, or Do young pelicans act differently than adults? The Observer is well situated to focus in on an exciting question to answer. Note: when addressing a comparison study of behavioral differences based on age or gender, be sure to guide students to a species that have observable differences to indicate age or gender. A good bird field guide makes that easy.

In-Class Preparation Lessons

1 Explain to students that they are going to visit the shoreline as scientists. Many people go to the coast to relax, take pictures, read, and to look at tide pool life. The difference between scientists and those who go for recreation is that scientists are very careful observers, they ask questions, and they write their observations down. As scientists, that is what the class will be doing also! Have them write down questions they have about bird life.

2 Encourage students to think about how birds depend on their environment. To assist this, have a variety of bird photographs or drawings. Bird-themed calendars are a terrific resource for this. Point out that birds have specialized body parts to help them survive where they live. Note especially how the length and shape of their beaks relates to depth of water where feeding occurs, as does the length of their legs; the shape and size of their feet is related to the way they travel, hunt and where they perch; their flight habits correspond with the shape and length of their wings. Of course, the colors of their feathers are also important, and if photographic examples are available, it is insightful to show differences in coloration among certain male and female bird species, and then explain what different roles each gender has. Classic example – ostrich female incubated eggs on nest during the day, the male incubates at night. The female ostrich is camouflaged for grasslands in the sunlight; the male is dark and camouflaged for nighttime. For a local example, the male bufflehead duck has conspicuous marking on its head to attract a mate, the female, who incubates the eggs, has inconspicuous markings and is more camouflaged. These are examples of physical adaptations of birds.

3 Now it is time to introduce examples of behavioral adaptations of birds. Birds have interesting and observable behaviors. Many of the birds seen on the shore have behavioral traits that are so characteristic either of shorebirds in general, or of individual species. For example the willet walks along the shallow tidal zone and when approached it flies a couple dozen yards to separate itself from the disturbance. When flying (behavioral adaptation) it shows bold black and white wing stripes (physical adaptation) to warn other willets of a disturbance. The double crested cormorant is an excellent underwater swimmer, helped by lacking oil in its feathers. Consequently, it must spend much time on exposed rocks and on the shore drying out. Often they perch with their wings held out to dry, as if they are on a clothesline!
4. Ask students to name verbs that describe behaviors that they do on a typical school day. This may include basic behaviors such as eating, drinking, walking and talking. Introduce the idea that these behaviors help them to be safe and to learn, and they help the student to survive in their environment (the school). It should not be difficult to transfer this scenario to birds. Now have students name verbs that describe activities that birds can be observed doing. For basics, this list should include at least: perching, flying, walking, feeding, preening, singing, and defending (chasing another bird or animal away).

Review the list of bird behaviors and remind students that some behaviors require more energy than others do. The more the bird performs “busy” behaviors, the more calories will be needed to take in, and the more demand on the need to feed. The more relaxing behaviors conducted, a less demand will be placed on finding food. Remind students that the ultimate goal for the birds is to survive; a secondary goal is for them to have a family and raise young. While meeting their basic needs they must avoid predation by other birds and animals. The question the students will now address is in the balance of living and avoiding being eaten, how do birds spend their time?

5. Ask students to think about bird survival and make a hypothesis, or predict how birds spend their time the most. Review the attached Research form provided have them write in their prediction to the statement, “For birds to survive I predict birds spend most of their time ____________________________.” Some time before the field trip it is recommended students get familiar with use of a field guide to identify birds, learn how to record numbers in groups of five with tally marks, and learn how to use binoculars.

Field Trip Activity – Bird Time Budget
This can be conducted first on the school campus as practice before visiting the coast.

Materials
- Enough clipboards for half of the class
- Data sheet listing behaviors of birds
- Pencil
- Binoculars, enough for half of the class
- Field Guide to identify birds
- Graph paper

Students are to dress appropriately- good walking shoes, clothing should avoid bright colors, long hair is to be tied back in case of windy conditions.

1. Divide students into cooperative learning groups of two students. One partner is designated as Observer, the other the Recorder. The Observer is to scan with their eyes and look for a bird. If necessary, binoculars are to be used to carefully watch the bird, so that one can be specific on what the bird is doing if it moves. The Recorder should stand or sit next to the Observer with a data sheet, clipboard and pencil ready to record. Once the Observer finds a bird, the Recorder says, “check”, softly. The Observer simply says a word that describes what the bird is doing at the time, for example, “perching”. The Recorder then places one tally mark after “Perching” on the data sheet. In about five seconds, the recorder is to repeat saying “check” and the Observer again says a word that describes what the bird is doing. This can continue for a period of a few minutes if the bird is cooperative. It is likely that the term “perching” will gather many data points; however, the Recorder is to be consistent in recording tally marks despite the
regularity. The Observer is to watch for behaviors such as preening, where it uses its beak to “comb” though its feathers.

2 After a period, have the partners switch roles and equipment with each other, and continue gathering data in tally marks.

3 When sufficient data has been collected have students find a comfortable place to evaluate their data. Have them count tally marks for reach behavior, and write the sum in the box at the side of the page opposite the behavior it represents. Do this for all behaviors. Then have them add up the totals of all their different behaviors, list the sum in the box at the bottom of the page.

4 On graph paper, have students each make a graph of their data. On the x axis, they write the behaviors. It is not important what the order is, but recommended as listed as is the order of behaviors on the data sheet, whether they were observed or not.

5 Have students create a bar graph for each of their behaviors observed, filling in the vertical bars for easy viewing.

6 Have student partners share their data with the class, reporting:
   A. how many data points were collected altogether, and
   B. which behavior was practiced most frequently, second most, and third most.

You may also invite them to share something interesting they observed, even if it is not related to bird behavior.

7 Invite comments from other students and review additional information from the Background section, as needed.

Consider specifying the question to address a particular ecological relationship or theme. Examples:
Do young pelicans behave differently than adult pelicans?
Do female pelicans behave differently than male pelicans?
Do cormorants behave differently in winter than spring?
What is the average (underwater) diving time for a grebe?

The California Coastal National Monument is a partnership in protecting unique California coastal natural resources. Visit www.blm.gov/ca/ccnm to learn more. For further information on this lesson contact Talbrech@blm.gov

Answers to Research Sheet fill-in: plant, survive, food, (any native bird), space.
Adaptations are something a ___ ___ ___ or animal has or does to help it ___ ___ ___ in its environment.

Birds adapt with different beaks to eat a variety of ___ ___ ___.

They behave in different ways to get their needs met and to find a mate.

A bird I may see today is a ____________________ . Like all birds, it needs food, water, and ___ ___ ___.

Common behaviors of birds are perching, walking, flying, feeding, nesting, and defending.
__________________________.

Data Sheet
Bird Time Budget

Date: ____________
Time: ____________
Partner:_________________
Location:________________

perching: 
walking:
 flying:
 feeding:
nesting:
defending:

Graph

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