



Table Rocks Curriculum

Build a Table Rocks Bird

Objective: The student will analyze various bird *adaptations* and identify how these characteristics help birds survive and thrive in different *environments*. They will compare different kinds of birds found on the Table Rocks and assess their structure, functions, and role in their *habitat*. They will then create their own species of bird.

Benchmarks Targeted: 2 and 3 (Grades 4-8)

Oregon Standards:

Subject Area: Life Science

Common Curriculum Goals: Diversity/Interdependence: Understand the relationships among living things and between living things and their environments.

Benchmark 2: Describe the relationship between characteristics of specific habitats and the organisms that live there. Describe how adaptations help a species survive.

Benchmark 3: Identify and describe the factors that influence or change the balance of populations in their environment.

Common Curriculum Goals: Organisms: Understand the characteristics, structure, and functions of an organism.

Benchmark 2: Group or classify organisms based on a variety of characteristics. Describe basic plant and animal structures and their functions.

Common Curriculum Goals: Heredity: Understand the transmission of traits in living things.

Benchmark 3: Describe how the traits of an organism are passed from generation to generation.

Subject Area: Scientific Inquiry

Common Curriculum Goals: Forming the Question/Hypothesis: Formulate and express scientific questions or hypotheses to be investigated.

Benchmark 2: Make observations. Ask questions or form hypotheses based on those observations, which can be explored through scientific investigations.

Benchmark 3: Based on observations and scientific concepts ask questions or form hypotheses that can be explored through scientific investigations.

Subject Area: The Arts

Common Curriculum Goals: Create, Present, and Perform: Apply ideas, techniques and processes in the arts.

Benchmark 2: Use experiences, imagination, observation, essential elements, and organizational principles to achieve a desired effect when creating, presenting, and/or performing works of art.

Benchmark 3: Select and combine essential elements and organizational principles to achieve a desired effect when creating, presenting, and/or performing works of art.

Length of Lesson: 45-60 minutes.

Materials:

- ✓ Various art supplies

- ✓ Recycled materials to construct bird

Key Vocabulary: *adaptation, carrion, coloration, environment, habitat, hatchling, iridescent, juvenile, offspring, talons*

Background:

Birds, like all other life forms, have **adaptations** that help them survive in their **environment**. These **adaptations** may assist them in finding food, building homes, maneuvering through their **habitat**, migrating, defending themselves and their territories, and successfully raising **offspring**. An **adaptation** may make a bird particularly well suited to live in one **habitat**, but poorly prepared to live in another.

Adaptations include the type or shape of beak, feet, and legs; the size and shape of wings; the **coloration** of its feathers; and its behaviors. These **adaptations** have developed over time and help each bird live and raise their young to ensure the survival of its species. Major **adaptations** of Table Rocks birds are listed in a table toward the end of the background information.

Beaks: Hummingbird- long and slender to probe flowers for nectar

Hawks- curved beak to tear meat

Pelican- pouch-like to hold the fish it catches

Woodpecker- pointed to break and probe bark of trees to look for insects

Finches and Sparrows- short, stout beak to crack the seeds and nuts it eats

Feet: Ducks- webbed to aid in walking on mud and swimming

Bald Eagle- strong with sharp **talons** to grasp prey

Hérons- long toes for balance and walking in the mud

Legs: Crane- long legs for wading and sneaking through tall grass

Ostrich- long, powerful legs for running

Osprey- powerful muscles to lift and carry prey

Wings: Turkey Vulture- large wings to help soar on air currents

Hummingbird- small wings that move in a sideways figure-eight pattern to enable aerial acrobatics such as hovering and flying backwards

Swallow- narrow and pointed for quick flying and sharp turns

Color: Male birds- many have bright **plumage** to attract mates during courtship

Female birds- some species have dull/pale **plumage** for camouflage while nesting

Plant Communities and Birds of the Table Rocks:

Please Note: While hiking the Table Rocks, you will notice a fair amount of overlap between the plant communities and the species that are found in each.

Oak Savannah: This plant community is characterized by many large Oregon white oak trees and scattered ponderosa pines. Fire occurs often in the oak savannah resulting in fire scars on many of the Oregon white oaks. Fire scars expose the heartwood of the tree to the elements which promotes fungi and other natural forms of decomposition that break down parts of the tree. This results in cavities, providing **habitat** for many bird species.

Additionally, ponderosa pine snags and dead oak trees offer cavity nesting sites for birds and other wildlife species. Many birds in this plant community are cavity nesters and prefer the protection this environment provides. Oaks also produce a large amount of acorns, which are a favorite food of birds, notably the acorn woodpecker. Pine and oak snags also provide a place for acorn woodpeckers to store their acorns for the winter. These trees are called granary trees. Among the oaks are a mixture of grasses and low shrubs which provide further *habitat* and food for birds. Insects, seeds, and berries are plentiful in this plant community as well.

- Birds found in the oak savanna include the Western Meadowlark, Oak Titmouse, Western Bluebird, Western Scrub Jay, White-breasted Nuthatch, Chipping Sparrow, Acorn Woodpecker, Ash-throated Flycatcher, Yellow-rumped Warbler, and Chipping Sparrow.

Chaparral: The chaparral is a shrub community dominated by buckbrush and white-leaf manzanita. The chaparral consists of dense patches of brush that allow birds to remain safely hidden from predators and provides excellent *habitat*. This plant community also provides protection and camouflage for nesting and raising young. Insects are plentiful here and food is rarely scarce.

- Birds found in the chaparral include Spotted Towhee, Anna's Hummingbird, Lesser Goldfinch, California Towhee, Chipping Sparrow, Wrentit, Purple Finch, Oak Titmouse, and Lazuli Bunting.

Mixed Woodland: The mixed woodland community consists of a combination of ponderosa pine, madrone, Douglas-fir, California black oak, and numerous other plant species. Here a dense canopy provides shade and a cooler environment than other plant communities. You find several different species of birds, most likely due to the diversity of tree species and consequent abundance of *habitats*. Many of the trees here produce berries or seeds that provide ample food. Dead, fallen logs and snags are quite common and host numerous species of insects which provide plenty of food.

- Birds found in the mixed woodland include the Western Tanager, Black-headed Grosbeak, Hermit Thrush, Pileated Woodpecker, and Pacific-slope Flycatcher.

Mounded Prairie/Vernal Pools: The mounded prairie community is unique and rare. A thin layer of granular rock fragments covers an impermeable volcanic rock which allows water to collect seasonally in depressions, creating what are known as vernal pools. In the early spring, birds use the pools for water, bathing, and plucking insects, invertebrates, and tadpoles from the shallow pools. Insects and seeds are also found in the vegetation of the mounded prairie and provide food for many species. The mesa-like tops are used by Turkey Vultures who need the space to run and gain momentum to dive off the edges in order to glide on the wind currents above the rock and locate *carrion*.

- Birds found in the mounded prairie/vernal pools include the Lark Sparrow, Chipping Sparrow, and Western Meadowlark. Along the edges are the Red-tailed Hawk, Violet-green Swallow, Vaux's Swift, White-throated Swift, Rock Wren, and Turkey Vulture.

Birds of Table Rock

Bird	Adaptations	Benefits
Turkey Vulture <i>Plant Community:</i> Mounded Prairie and Mixed Woodland	Strong sense of smell (unusual for birds)	Allows bird to locate carrion (dead animals)
	Long legs and toes	Adapted for walking on land, not for shredding meat or grasping prey
	Bald head	Bare skin easier to clean than feathers
	Large wings (up to 6 foot wingspan)	For riding wind currents (thermals) and searching for food
	Excellent eyesight	For locating carrion from high in the air
Acorn Woodpecker <i>Plant Community:</i> Oak Savannah	Long, stiff tail feathers	Props body against tree and aids in climbing
	Sticky, barbed tongue that wraps around skull	Allows extension of tongue up to 5 inches beyond beak to probe holes for insects
	Sturdy, chisel-shaped bill	Suited for hammering and excavating wood (pointed beak would break)
	Highly social (searches for food, reproduces, nests, and lives with others)	More effectively search for food and raise young, reduces competition
	Thick skull	Cushions the brain and reduces impact of pecking wood
	Nostrils have bristled feathers	Feathers with bristles keep out wood dust
Blue-gray Gnatcatcher <i>Plant Community:</i> Chaparral	Slender, pointed bills	Ideal for plucking small insects from branches or tiny crevices
	Extensive white outer tail feathers	Flashes spread tail feathers to scare small insects out of hiding
	Rictal bristles (stiff, hair-like feathers that grow from corners of mouth)	May protect bird's eyes from insect legs and wings when feeding
	Flexible tail	Constantly moving tail around to flush out insects to eat
Anna's Hummingbird <i>Plant Community:</i> Chaparral	Wings move in a figure eight motion	Gives bird ability to feed while hovering and to fly forward, backward, sideways, up and down to catch bugs in air
	Long, slender tongue that can extend beyond tip of bill	Enables bird to reach nectar stores at base of flower
	Iridescent feathers on throat and head	Used to flash warnings at rival males when they enter breeding territory
	Incredibly fast heart rate (1,260 beats per minute!)	Fast heart rate keeps them moving fast
Red-tailed Hawk <i>Plant Community:</i> All	Strong legs and sharp <i>talons</i>	Enables bird to catch, hold, and kill prey
	Sharp, curved beak	Used to rip and tear flesh of prey animals
	Keen eyesight; four to eight times that of humans	Allows bird to spot prey from great distances
	Powerful jaws	For ripping and tearing meat

All birds have the following adaptations:

- **Hollow bones**- for saving weight
- **Feathers**- for flight and warmth
- **Wings are modified forelimbs**- they do just fine without hands or fingers
- **Ability to shrink some organs when not using them**- for saving weight during migration
- **Lack of urinary bladder**-for saving weight during flight
- **Fused pelvic bones**- they don't need to do much walking and fusion saves weight and increases stability during flight
- **Lack of teeth**- their beaks work great for their diet and beaks weigh less than teeth.
- **Egg-laying**- babies are too heavy to fly around with
- **Only one ovary in most females**- (all other vertebrates have two)- for saving weight during flight
- **Scales on legs**- scales are tough, and stay clean. *Note that some birds, such as owls, do have feathers on their legs*
- **Large sternum**- (breastbone)- for attachment of big wing muscles

Procedure: (Adapted from “Adaptation Artistry” an activity by [Project Wild](#))

Preparation:

Students will discuss the characteristics of what makes them who they are, such as appearance, home, personality, and background. As humans, how do we protect ourselves? To introduce the concept of **adaptation**, have a student try to unbutton their shirt in front of the class without using thumbs (you may find it helpful to tape their thumb down to further illustrate this point). Hold a race between that student and another who can use thumbs to show our opposable thumb **adaptation** (can be very funny). Using the **adaptation** chart that accompanies this lesson in the “Background” section, discuss some of the **adaptations** of birds on Table Rocks with students. If possible, display the chart on the board or on an overhead projector so students can refer to it as they build their Table Rocks bird.

Grades 4-5: You may read the story [Flute’s Journey](#) by Lynne Cherry to help younger students understand the concept of an **adaptation**. While reading the story, ask students to observe the **habitat**, food, egg type, and protective instincts of Flute. Give an explanation of these different components if necessary. Help students draw parallels between their own characteristics and needs to those of the bird in the story.

Grades 6-8: Focus on the advantages of having particular characteristics and have students brainstorm a list of other birds they may have seen that share those traits with the birds of Table Rocks.

Activity:

1) Review the **adaptation** chart and the plant communities of Table Rocks with the students (see “Background” section). Stress the connection between the **habitat** and the traits the bird has developed to survive there. Tell the students they are going to use their imagination to create their own bird. They can use the **adaptations** already discussed or make up new ones. To begin, have each student decide:

- In which Table Rocks’ plant community/s does it live?
- What does it eat?

- How does it move and travel?
- Is it male or female?
- Where does it nest?
- How does it raise its *offspring*?
- How does it defend itself against predators?

Once these choices have been made, have them make a list of *adaptations* for their bird. What *adaptations* will make their bird an expert in its *environment*?

2) Using their *adaptations* list, have students choose an artistic medium and begin crafting or drawing their bird. Students can use clay, paper mâché, construction paper, cardboard, paints, markers, recycled materials, or whatever types of art supplies are available. Completed projects can be displayed in the classroom or can be presented to the class as a group.

3) Ask students to consider what would happen to their bird if its *habitat* were altered or changed completely. How might an altered *habitat* affect access to food or nesting sites? What difficulties would the bird have? Would it be able to adapt (or survive?)

Grades 6-8: In addition to the physical creation of the bird, students should also write a report about their bird. Reports should include the bird's name, diet, *habitat*, nesting requirements, and unique behaviors and should explain how its *adaptations* help it survive in its *environment*.

Scientific Inquiry:

As a pre-hike activity, have students predict one bird they will see on their Table Rocks hike. Have them record their hypothesis (bird name) on a piece of paper with their name and give it to you before the trip. Before the hike, ask students to remember two birds they saw, the type of *habitat* they were in, and the behavior of the birds. They may jot this down during the hike, or back in the classroom the students could write down the information from the hike on a piece of paper with their name on it. Have students compile two data lists: one of predicted birds and one of actual birds sighted. You can calculate a percentage of the overlap to see how well they did with their predictions.

Grades 6-8: Create a chart (or have students create) including the names of the most common birds on Table Rocks, their *habitat*(s), and a space for notes. Each student should carry a copy of this chart on the hike. As they walk through the various plant communities, students should note which birds they see or hear along with any field observations such as behaviors, song, variations in *plumage*, etc. Back at school, students should write a short report comparing actual and predicted findings with an explanation of any discrepancies. Include how these findings might be affected by season, time of day, weather, etc.

Follow-up:

While hiking on the Table Rocks, ask students to watch for other birds and consider how they have adapted to life in their *habitat* there. Have students name two bird *adaptations* for each of the following body parts: beaks, feet, legs, wings, and color. Which birds demonstrate them and what are the advantages of the adaptations?

Grades 6-8: Determine which Table Rocks birds migrate with the seasons. Investigate some threats facing migratory birds today and what is being done to help them. Have students observe or participate in International Migratory Bird Day on the second Saturday in May each year.

Extensions:

- Have students make a life-size drawing of the bird they created. Later, have students compose a short story about the adventures their bird may encounter.
- Have students build mobiles of an entire bird family (male, female, *juvenile*) keeping in mind that males and females may have different *coloration*. They may also want to research what the egg, *hatchling*, and nest look like.
- Have students collect pictures of birds to build a bulletin board collage of various *adaptations*. Have them compare their imaginary birds to real ones with similar *adaptations*.

Discussion Questions:

Compare a bird adaptation to a human adaptation for the same type of thing (walking, eating etc.). How are they similar? How are they different?

Use student experiences from earlier in the lesson to answer this question.

Does every bird have an adaptation?

*Yes, all birds have the **adaptations** listed. Birds, like all animals, also have **adaptations** to eat, reproduce, and find shelter.*

Identify two birds found in a similar habitat and compare and contrast their adaptations.

Turkey Vulture vs. Red-tailed Hawk

Great Blue Heron vs. Mallard Duck

Acorn Woodpecker vs. Blue-gray Gnatcatcher

Have you ever been unable to access or use one of your adaptations? Describe.

Answer based on students experiences.

How does camouflage benefit the birds of Table Rocks? Give examples.

Protects females while nesting, prevent songbirds from being preyed upon, doesn't draw attention to eggs.

Blue-gray gnatcatchers do not have any bright colors so they are rarely attacked while foraging high in the tree tops.

What are two threats facing the birds of Table Rocks?

***Destruction of habitat:** Many birds don't spend the whole year at Table Rocks. Therefore, even though Table Rocks are protected as an Area of Critical Environmental Concern, the **habitat** used while the birds migrate may not be protected. This often causes migrating birds to travel farther while seeking food or shelter, as resting places used in previous*

years have disappeared due to development. The extra effort required can cause exhaustion, starvation, and death.

Pollution: *Can cause degradation in egg shells, food availability, nesting structures etc. Birds can get caught and killed in fishing line that is discarded along fishing waterways such as nearby Tou Velle State Park and the Rogue River.*

References:

Charles, Dr. Cheryl, ed. Project Wild: K-12 Activity Guide. 2nd ed. Western Regional Environmental Education Council, Inc, 1995.

Cherry, Lynne. Flute's Journey: The Life of a Wood Thrush. San Diego: Harcourt and Brace, 1997.

Klamath Bird Observatory. 05 November 2007 <<http://www.klamathbird.org>>.

Partners in Flight. J.M Ruth. 2006. USGS Patuxent Wildlife Research Center. 06 Feb. 2008 <<http://www.partnersinflight.org/>>.

Reyes, Chris. The Table Rocks of Jackson County: Islands in the Sky. Ashland: Independent Printing Company, 1994.

Rogue Valley Audubon Society. Ric Thowless. Rogue Valley Audubon Society. 05 November 2007 <<http://www.roguevalleyaudubon.org>>.

Table Rocks Environmental Education. 2007. USDI BLM. 05 November 2007 <<http://www.blm.gov/or/resources/recreation/tablerock/index.php>>.