

The Art of Saving Birds



OBJECTIVES:

Students will:

1. reuse discarded items to create a model of a bird.
2. explain how reducing waste conserves natural resources and wildlife habitat.



STANDARDS: Science



SKILLS: Analysis, classification, construction, description, problem solving



SETTING: Classroom or multiuse space



TIME: 120 minutes over two days



VOCABULARY:

Carnivores
Conserve
Ecosystem
Endangered
Food chain
Food web
Habitat
Herbivores
Omnivores
Reduce
Reuse
Species
Threatened

Introduction

Overview:

In this lesson, students will learn about how their waste can impact habitat for plants and animals. Working in groups, they will create a model of a bird species by reusing materials brought from home. Students will discover how the practice of reducing waste saves natural resources, which can also conserve habitat for wildlife.

Teacher Background:

The items we use every day originate from natural resources. For example, trees are harvested for wood to make paper, water bottles are made from petroleum or fossil fuels, the food we eat comes from plants, and metal cans are made from minerals. Many of these natural resources, such as trees, water used during the manufacturing process, or the land where oil and minerals are mined, provide habitat for wildlife. The process of extracting natural resources, manufacturing and transporting products, and landfilling waste can reduce or impact habitat for wildlife. For example, displaced garbage or litter can remain in the environment for many years. During the process of making products, pollutants can be released into the environment. In order to manage the disposal of waste materials, landfills have been developed in areas that once provided homes to plants and animals.

To protect wildlife and natural areas, we can take steps to reduce our impact on the environment. The practice of reducing waste helps to conserve natural resources by keeping items out of landfills. By using less stuff, we conserve natural resources. By participat-

ing in community clean-up days, providing habitat for wildlife at home or school, reusing when possible, and purchasing products with minimal or recycled packaging, we can do our part to protect wildlife and natural areas.

Materials:

Students:

- “Creating a Bird Project Directions” (one per student)
- “Our Created Bird worksheet” (one per student)
- “Bird Information Pages” (one bird per group)
- Bird books with pictures (Peterson’s Western Field Guide), Internet bird sites, other references
- Waste materials that are reused, such as paper, cardboard, cotton wads, corks, bottle caps, toothpicks, chopsticks, string, pieces of cloth
- Classroom art materials such as tape, crayons, paper clips, rubber bands, glue, etc. (one set for for each group)
- Poster paper and marker pens (one set for each group)

Teacher:

- “Creating a Bird Project Directions” overhead
- Poster example (and bird example if available)
- Rubric overhead
- Rubrics (one per student)

Preparation:

Be prepared to place students in groups of two or three.

Save materials collected from other lessons in the guide for students to use in making models of birds.

Look in the teacher workroom or art cabinet for colorful scraps of materials such feathers, beads, etc.



ACTIVITY

Discussion

1. Ask the students where they think their classroom garbage goes once it leaves the school? How many people, vehicles or other equipment are required to manage the things we no longer need? (List their ideas on the board.)
2. Have the students consider what they would do with their garbage at home if the garbage company suddenly stopped picking it up? Would you try to reduce the amount of garbage you make? How? What would your neighborhood look like if there was nowhere to send garbage away?
3. Have the students think about the place where their garbage goes. Describe your local landfill in terms of size and location. For example: 2,170 acres of land have been set aside in the hills of Livermore for the Altamont Landfill. An acre is about the size of one football field. So far, 470 acres are used for waste disposal, and approximately 1,300 acres are currently being managed to provide habitat for wildlife species. Ask the students what will happen to the numbers above if we continue to produce waste.
4. What natural resource is required to site a landfill for our waste disposal (land)? (Describe the ecosystem your landfill is in. For example: Our landfill is in rolling foothills in a dry grassland ecosystem.) Ask them to close their eyes and imagine what the land might have looked like before a landfill was built. Were there creeks, hills or valleys? Was the land flat? How much rain do you think this ecosystem gets? What kinds of habitat does it have?
5. Explain that there are many species of wildlife and plants that live in the ecosystems where our landfill is located. What kind of plants and animals would you expect to see? Show pictures of different birds and other animals that live in the ecosystem. Possible birds include: Western Burrowing Owl, Golden Eagle, Northern Harrier, White-tailed Kite, Ferruginous Hawk, Prairie Falcon, Loggerhead Shrike. Possible animals include mice, moles, rabbits, fox, and coyote.
6. Which of these animals and birds are herbivores (eating plants)? Which are carnivores (eating meat)? Are there any omnivores that eat both plants and animals in this ecosystem? What do you think a food web for these animals might look like (who eats what)? (List birds and animals in columns and then connect food web with arrows.)
7. Ask students to describe what these plants and animals need in order to survive in their habitat (space, shelter, food, water, etc.). How does the garbage you throw away have an impact on the land? For example, what happens to the grass? Does that affect rabbits? If there are fewer rabbits, does that affect any other animals in our food web? What if a bird nests or hunts in the grasslands? Can these animals survive here if their habitat is altered, for example by the conditions found at a landfill?
8. Explain that habitat is also removed when we make new things. The overharvesting of forests in the United States to address the demand for lumber and paper has reduced the habitat available for all kinds of animals, including the spotted owl. The spotted owl is endangered because it builds its nest only in old-growth forests.
9. Have the students think of ways that we could use less and create less waste to conserve habitat for wildlife? (Write ideas on board. List might include use both sides of paper, don't break pencils, buy things with less packaging, reuse, and recycle.)
10. Explain that the students will be working on a project that will reduce their waste so they can save habitat for wildlife and learn about birds that might live near our landfill at the same time.

(continued on next page)



ACTIVITY – continued

Procedure

1. Explain the three steps to the group project. We're going to divide into groups and each group will 1) conduct research on a particular bird, 2) make a model of your bird with reused materials, and 3) present your research and model to the class in a poster session.
2. Tell the students that they will be given handouts, will use the Internet, or bird books to answer the questions on "Our Created Bird" worksheet. Post the overhead of the student worksheet "Creating a Bird Project Directions." Review the instructions, read one of the 11 "Bird Information Pages" and discuss how to use the information to fill in the worksheet. For example, Western Burrowing Owls are commonly found in grassland areas. They rely on burrows dug by burrowing mammals for their nests. This species eats insects, rodents, amphibians or small birds, and they are often seen perching or standing by their burrow. Western Burrowing Owls are threatened primarily by habitat loss, eradication of ground squirrels or other burrowing rodents and agricultural practices. After you've answered the questions about your bird, try to think of three ways that you could reduce waste and conserve habitat for your bird.
3. Describe some of the items students will be reusing to create their birds. This could be a variety of materials including cotton wads, corks, cardboard or toilet paper rolls, etc. Ask students to show any items they have brought from home for reuse. You can use tape, string, paper clips, glue, or rubber bands to hold your model together. When you're done, write down the materials you reused and kept out of the landfill on your worksheet.
4. Describe how the groups will make a poster of their research findings. Show the overhead of poster directions. Use the table on the directions page to guide your poster design. Put information about habitat in one square, information on the food chain in another, information on endangered status, and how the landfill might affect your bird and what you can do about it in another square.
5. Show an example of a poster and a bird model if possible. Put up the overhead for the rubric and review with the class the expectations of this lesson.
6. Place the students in groups of three. Hand out a copy of the instructions and student worksheet to each student and one bird information card for each group. Distribute the materials for the activity to each group. Each group will research and create a model and poster for a different bird species that might be found in habitat near the landfill.
7. Have each group present their bird with its story to the class. After the presentations, the students may keep their artwork or reuse the items for another project.

Wrap-Up

1. Allow the groups to ask questions or give feedback to other groups about their bird stories.
2. Have the groups explain how reducing waste conserves natural resources and habitat for wildlife. Summarize: Reducing our use of new materials reduces impacts to ecosystems that provide raw materials and impacts to ecosystems used for landfill sites. Make a list of ideas for reducing waste to conserve habitats including.

Final Assessment Idea

Look at learning evident in oral reports and collect individual worksheets. After the lesson, have students write three ways that reducing waste conserves natural resources and habitat for wildlife.



RESOURCES

Extensions:

Have students create a habitat diorama for their bird reusing materials to show where their bird lived.

Create a classroom book about how reducing waste protects wildlife and habitat. In pairs or groups, have students research how a particular waste item affects wildlife or impacts habitat using the school library or the Internet. Students can reuse materials to create their story pages. Compile all of the group stories into a classroom book to share with other classes.

Teacher Materials:

California State Content Standards

The standards below represent broad academic concepts. This lesson provides connections to these academic concepts through hands-on activities and exploration. This lesson is not designed for a student to master the concepts presented in the standards. Additional lessons in the classroom that build on this lesson or the standard(s) ensure that students will have the opportunity to master these concepts.

SCIENCE	CONTENT STANDARDS
Grade 4	Life Science 2.a. Students know plants are the primary source of matter and energy entering most food chains. 2.b. Students know producers and consumers make up food chains and food webs, competing for resources in ecosystems (herbivores, carnivores, omnivores, and decomposers). 3.a. Students know ecosystems can be characterized by their living and nonliving components. 3.b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well and some cannot survive at all.





Teacher

The Art of Saving Birds Rubric

A rubric is a scoring tool that defines the criteria by which a student's work will be evaluated. This rubric is provided to assist you in setting expectations for students and assessing their performance and engagement during the lesson based on specific tasks. Ideally, a rubric is developed with the cooperation of the students. Two blank rows have been provided for you and your class to develop and add your own assessment criteria.

CATEGORY	4	3	2	1
Group reports	Every question was answered in the group report.	Most questions were answered in the group report.	Few of the questions were answered in the group report.	None of the questions were answered in the group report.
Group work	Group composed a creative model of a bird.	Group composed a model of a bird.	Group is unable to compose a complete model of a bird.	Group does not participate in the activity.





Creating a Bird Project Directions

Task 1: Research

1. Read about your bird on the information sheet.
2. Conduct research about your bird using your handout, the Internet, field guides or books from the library, to answer the questions on your worksheet:
 - a. What is the common and scientific name?
 - b. What type of habitat does it live in?
 - c. Where is the habitat located?
 - d. What does it eat?
 - e. Is it threatened or endangered?
 - f. Why it is threatened or endangered?
3. Record three ideas for how you could reduce waste in order to conserve habitat for birds.



Task 2: Build a Model Bird

1. Construct a model of the bird by reusing scrap materials.
2. Record the materials you used to construct your bird on your worksheet.

Task 3: Make a Poster with Your Research Information

Make a poster using the information on your worksheet to present to class:

Yellow-Tailed Pipsqueak <i>Elanus Sulfurous</i>	
<u>Where It Lives</u>	<u>What It Eats</u>
<u>Status Information</u>	<u>Landfill Impacts & Ideas for Reducing</u>

Name: _____ Date: _____





Student

Our Created Bird

Common name of bird: _____

Scientific name of bird: _____

Habitat and location: _____

What does it eat? _____

Is it threatened or endangered? _____

Why it is threatened or endangered? _____

Three ways to reduce waste and conserve habitat for birds:

1. _____

2. _____

3. _____

What materials were reused to construct it? _____

This bird was created by: _____

Name: _____

Date: _____





Bird Information Pages

Common name: Swainson's Hawk

Scientific name: *Buteo swainsoni*

Habitat: foothill grasslands or valleys near creeks

Food: voles, birds, and insects

Status-reason: There has been a 90% decline in the population of Swainson's Hawks in California since the year 1990. The main causes of the population decline are loss of habitat due to commercial development and loss of food sources due to changes in nearby agricultural land and pesticide use.



Swainson's Hawks migrate south in the fall and winter to find warmer weather. Frequently they migrate in large groups, sometimes into the thousands. Some travel to Mexico, and some go as far south to Argentina. They return to California in the spring to build their nests in tall trees near creeks and open fields, which are home to their prey. Swainson's Hawks have amazing eyesight and hunt during the day. While hunting they fly close to the ground and can even be seen chasing after insects. Other times they sit high on their perch waiting to spot small animals like rodents or even frogs and small snakes.

Common name: Willow Flycatcher

Scientific name: *Empidonax traillii*

Habitat: swampy thickets, upland pastures, abandoned orchards

Food: insects and berries

Status-reason: Endangered and declining. The number of flycatchers is declining due to habitat loss along creeks and because of disturbances in their breeding areas from cattle grazing.



Willow Flycatchers migrate south in the fall and winter and return to California in the spring to build their nests in small bushes or grasses near creeks. Male flycatchers sing to protect their hunting territory during mating season. They catch flying insects by making short quick flights from their perches.

Common name: Western Burrowing Owl

Scientific name: *Athene cunicularia hypugea*

Habitat: open grasslands

Food: insects, rodents, fish

Status-reason: California Species of Special Concern and Federally—due to loss of habitat.



The Western Burrowing Owl is one of the smallest species of owls, being only nine inches long. It lives in underground burrows usually made by other animals that have abandoned their homes. Unlike most owls, which are nocturnal, the Western Burrowing Owl is diurnal meaning that it is active during both the day and night. Dusk and dawn are its most active times of day when it hunts prey using its almost silent flight to sneak up on insects, rodents, reptiles, and amphibians. The burrowing owl is one of the more visible species of owls because it is diurnal and spends much of its time standing or perching near its nest.

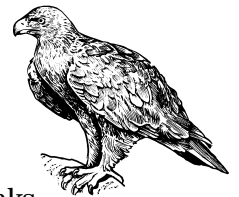
Common name: Golden Eagle

Scientific name: *Aquila chrysaetos*

Habitat: open grass lands, oak savanna

Food: rodents, rabbits, snakes, skunks

Status-reason: California Species of Special Concern and is fully protected—due to loss of habitat and hunting (even though it is against the law to kill these birds).



The Golden Eagle is a great hunter, reaching speeds of 240 to 320 km/h when diving to catch its prey. Though the Golden Eagle is very skilled at hunting, when there is a low food supply, it must migrate to an area with more food. The Golden Eagle begins mating typically at four years of age, and most eagles mate with the same partner for life, which is uncommon for most birds. Though the Golden Eagle can be found across northern areas of the U.S., the densest population of Golden Eagles can be found in Livermore, CA, near the Altamont Landfill.





Student

Bird Information Pages

Common name: Northern Harrier

Scientific name: *Circus cyaneus*

Habitat: grasslands and wetlands

Food: small mammals, birds, reptiles, insects

Status-reason: California Species of Special Concern—due to loss of habitat, prey, and nesting areas



The Northern Harrier flies slow and low to the ground until it hears its prey and plunges down to catch it. It's sense of hearing is better than most hawks due to the disk shape of its face, which is similar to owls and amplifies sounds. The Northern Harrier builds its nest on the ground. Because it is such a good hunter, one male frequently has two to three female mates that he cares for by providing food and protection during mating season.

Common name: White-tailed Kite

Scientific name: *Elanus leucurus*

Habitat: open grasslands and wetlands

Food: rodents, small birds

Status-reason: They are fully protected due to near extinction in 1930s because of loss of habitat, hunting, and egg poaching. Today their numbers are greater but loss of habitat and changes in farming that affect their prey is a concern.



The White-tailed Kite is not a migratory bird but moves around a lot, leaving areas with a shrinking food supply to find better areas for hunting. The kite got its name due to its unique style of hunting called “kiting” where it flaps its wings in such a way that it remains in the same spot up in the sky as though it is standing in place. It then dives down attacking its prey when it deems ready. Outside of mating season, kites live in groups up to one hundred birds though smaller groups of about five are more common. Frequently kite communities hunt in the same general area together, but do not attack a specific prey item as a team.

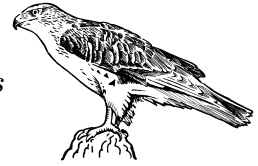
Common name: Ferruginous Hawk

Scientific name: *Buteo regalis*

Habitat: prairies, bushy open country, grasslands

Food: ground squirrels and rodents

Status-reason: Federal Non-game Migratory Bird Species of Management Concern; California Species of Special Concern—due to loss of habitat



Ferruginous Hawks have a rare adaptation that makes it possible for them to live in colder climates; feathers that go down their legs, which is uncommon in most birds and makes it look as though they are wearing leg warmers. They migrate to the Bay Area in the winter months, whereas many other birds fly much farther south to warmer climates. While here, they are solitary birds, allowing more area for hunting prey. Most commonly they attack prey from the ground or a low perch.

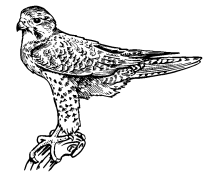
Common name: Prairie Falcon

Scientific name: *Falco mexicanus*

Habitat: barren mountains, dry plains, and prairies

Food: ground squirrels, birds, reptiles, insects

Status-reason: State and federally protected—due to rodent-poisoning programs



The Prairie Falcon is a skillful flyer. It uses this to its advantage while hunting. It flies high and characteristically swoops down on its mammal prey. It has also been known to catch birds, even some of the fastest fliers, by chasing them through the sky and dive bombing them to the grounds where it kills them.





Bird Information Pages

Common name: Loggerhead Shrike
Scientific name: *Lanius ludovicianus*

Habitat: grasslands and orchards

Food: insects, small birds or mice

Status-reason: Population declining—due to loss of habitat and use of pesticides and herbicides among farmers.



The Loggerhead Shrike kills prey whenever it can and keeps excess food by sticking it on thorns, barbed wire, or another spiky object to eat later. The bird was previously named “Butcher Bird” because of this practice. Though it is like a butcher with its prey, the bird is fairly small, 8-10” and has a dark grey head with a black tail and wings.

Common name: American Robin
Scientific name: *Turdus migratorius*

Habitat: towns, gardens, woodlands, agricultural lands

Food: earthworms, berries, fruit, insects

Status-reason: Protected by U.S. migratory bird act but are in no danger of becoming extinct.



You may have seen the American Robin hunting for its lunch on your school lawn or in your backyard. It stands very still with its head tilted to one side waiting until it sees its prey, which is usually an earthworm, and then catches it. The bird’s bright red-orange chest, contrasting with its white underbelly, brown back, and black head makes it easier to recognize. Currently the robin is a protected bird under the U.S. Migratory Bird Protection Act but previously they were hunted in southern states and their meat was considered a delicacy.

Common name: Anna’s Hummingbird

Scientific name: *Calypte anna*

Habitat: chaparral, brushy oak woodlands, and gardens

Food: nectar and small nectar-feeding insects

Status-reason: Expanding habitat range because of increase in suburban gardens and feeders making it possible for them to find food in a wider range of areas.



Hummingbirds have three adaptations that make it possible for them to eat nectar from flowers and sap from trees: their long narrow bills, long tongues, and their ability to hover in front of their food source. All species of hummingbirds aggressively defend their eating territory even if they have had enough to eat, which on some days can equal half the amount of their body weight. Female hummingbirds mark eating territory with the movement of their tail, which signals to the other birds not to eat in that area. Male hummingbirds protect their area with loud buzzing and swooping, flying displays. During the spring, juvenile or newborn hummingbirds are not yet familiar with these displays and intrude on feeding territory, which is why you may see many hummingbirds at your feeder from July to late fall. Hummingbirds are also unique because they are the only bird that has adapted to fly both backwards and forwards.



DEFINITIONS

Vocabulary:

Carnivores: animals that eat other animals.

Conserve: to protect something from harm or destruction.

Ecosystem: the interacting system of a biological community and its nonliving environment; also, the place where interactions occur.

Endangered: a species that is in danger of extinction in the foreseeable future.

Extinct: a species or subspecies that no longer exists in living form.

Food chain: the sequence of one organism eating another organism. An example of a food chain is the following: green plants (using sunlight to grow) are eaten by sheep, which are eaten by wolves, which die and are eaten by decomposers that free fertilizing material into the soil that are needed by the plants to grow.

Food web: many food chains that are interconnected.

Habitat: the place where an organism normally lives and thrives.

Herbivores: animals that eat plants.

Omnivores: animals that eat both plants and animals.

Reduce: use less “stuff” and produce less waste.

Reuse: extending the life of an item by reusing it again as it is or creating a new use for it.

Species: a group of plants or animals that have common characteristics.

Threatened: a plant or animal species that is likely to become endangered in the near future.

