

The Wildlife Kids Club April 2006 E-Magazine

Nature of Science Curriculum: Raptors

This curriculum is designed to accompany the free monthly E-magazine offered through the [Wildlife Kids Club](#) website.

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Outline of the Four Curriculum Sections-

This curriculum is divided into 4 major sections, providing one unique activity for each week of the month. The content can be easily adapted to suit individual teaching needs.

The major goal of this month's unit is to provide students with an introduction to some common raptors that are found throughout much of California. Interesting accounts of other birds, such as the exciting re-discovery of the Ivory-billed woodpecker, are also included. **Students acquire tools for identifying and researching** the lives of these fascinating animals, and gain exposure to the greater ecological web of which they are a part. **Reading, writing, and research are all core components in this curriculum.**

First, students are introduced to the amazing variety of local species through the Wildlife Kids Club E-Magazine. Next, a quiz tests their **reading comprehension** of the articles. The monthly Concept Definition Handout can then be given to students. Through this, students gain an understanding of a **monthly biological concept** related to the overall topic. A brief quiz on the Concept Definition is provided. Finally, students will gain a **focused knowledge of one local raptor species** through a Species Report and presentation. All of these components can be adapted for use with various grade levels.

Curriculum Timeline:

- **Week 1:** Assign reading of the three E-Magazine articles.
- **Week 2:** Quiz on the E-Magazine. Assign reading of the Concept Definition: “Apex Predators and the Food Web.”
- **Week 3:** Concept Quiz. Introduce and assign the Species Report.
- **Week 4:** Species Report presentations.

About the Reading Quiz

We have supplied a short quiz to help students focus on the learning concepts found in the E-Magazine. The reading and questions introduce students to the lives of the California birds of prey, including a look at a few of their interesting behaviors. Also, links are shown between these important apex predators and the other species they depend upon for survival.

Together, the readings and the quiz can serve as an introduction to the lives of the raptors, which can later be explored more deeply through the Species Report.

Reading Quiz Answer Key

This quiz is based on the following sections of *Discover the Mystery of Nature E-Magazine, Issue #2: A Look at Wildlife; In the News; Animal Communication and Behavior*)

1. B 2. C 3. A 4. C 5. A 6. B 7. B 8. C 9. A 10. C

Concept Definition Quiz:

Hand out the Concept Sheet as homework for students to study.

Test students on their knowledge and understanding of the monthly concept by asking them three questions:

- 1) Spell the phrase “apex predator.”
- 2) Correctly use the phrase in a sentence.
- 3) Free Write: Give an example of an apex predator and its role in the food chain. How do predators help the rest of the food chain?

About the California Raptor Species Report

Learning Goals:

This unit gives students an in-depth introduction to a local raptor species. Identifying characteristics and life history information are considered. Further, children will practice asking some basic observational questions that will help guide their research into the lives of these amazing birds of prey. Depending on the class's needs, teachers can adapt the research report into a short assignment or a more in-depth project.

We have selected the Red-tailed hawk as a focal species, because it is found throughout much of California. We also encourage students to research different local raptors, but we cannot at this time provide detailed fact sheets beyond the one offered here for the Red-tailed hawk.

Procedure:

1. Give the students the list of research questions from below, or adapt the questions as needed. Have them spend some time researching the questions. The Fact sheet that is provided can be used; we also recommend resources such as the *Peterson's* or *Audubon Field Guides* series. There are also helpful resources on the Internet, such as the free *eNature* electronic field guide. Consider having your students use at least three sources, to enhance project depth and to provide practice with research skills.
2. Have the students compile their research into a 1-2 page creative presentation. The presentation could be a poster showing a color drawing of the raptor and its habitat, along with all the information from the question list. We recommend requiring a visual component such as a drawing of the hawk and its habitat, because this helps many students to deepen their learning experience and identification abilities.
3. Depending on the needs of your class, modify this project as necessary. Use the research report as a starting point for discussions of related concepts, such as open space conservation. Students can also integrate their new knowledge through a creative writing piece depicting "24 hours in the life of a raptor."

Species Report Questions

Pick a local raptor to study for your report.

Name: What is the common name of the animal? What is the scientific name?

Identification: What does the raptor look like? Does it have any unique features to its appearance? Draw a picture of the animal.

Range: In what geographic area does the animal live?

Habitat: What type of environment does the raptor live in?

Adaptations: How does this raptor's body help it to survive? What special features make this animal a bird of prey?

Eating Habits: What types of food does this animal eat?

Sounds: Describe the sounds this raptor makes. What do the sounds mean? Can you imitate them?

Other Behaviors: What other behaviors does this type of raptor display?

Predators: Are there any animals that might be a threat to this species?

Environmental Needs: What does this species need to survive in a healthy way?

Odd or Exceptional Facts: What is unique about this animal?

Questions: What do you wonder about this bird of prey? If you could ask the raptor a question about its life, what would you ask?

Sources: List your works cited.

Reading Quiz *Discover the Mystery of Nature E-Magazine, Issue #2*

1. Raptors are:
 - A. Small songbirds, such as the winter wren and ruby-crowned kinglet
 - B. Birds of prey with hooked beaks, strong talons, and powerful eyesight
 - C. A species of endangered mammals

2. An important reason that raptors migrate is:
 - A. Wintertime temperatures are too cold for them
 - B. Their muscles require extra exercise to stay fit
 - C. There is less food available in the winter, and they must go to where there is more food.

3. Red-tailed hawks hunt small mammals like mice and squirrels.
 - A. True
 - B. False

4. What are “thermals”?
 - A. Pockets of cold air
 - B. Special types of chest and back feathers that keep raptors warm
 - C. Warm air that rises up and lifts birds high into the air

5. Which group of raptors specializes in hunting small songbirds?
 - A. Accipiters
 - B. Buteos
 - C. Vultures

6. What “extinct” bird was recently re-discovered in the Southern U.S.?
 - A. Pileated woodpecker
 - B. Ivory-billed woodpecker
 - C. Red-bellied woodpecker

7. Protecting forests is one of the most important ways to help endangered and rare species like the “extinct” woodpecker to survive.
 - A. False
 - B. True

8. Red-winged blackbirds use their colorful shoulder feathers to:
 - A. Attract mates

- B. Help see each other when flying in a flock at night
 - C. Warn other males to stay away from their territories
9. Female red-winged blackbirds:
- A. Are striped with brown and tan feathers for camouflage
 - B. Are the same color as males, except they have no red or yellow patches on their shoulders
 - C. Are a dull green color with speckled wings
10. Hiding their “shoulder badges” helps red-winged blackbirds to:
- A. Hide from hawks and owls
 - B. Absorb more heat from the sun on cold days
 - C. Avoid fighting and save energy

Concept: Apex Predators and the Food Web

There is a “**food web**” that exists in nature. Have you heard of it? To understand what an apex predator is, it’s important to know about this food web. All of the animals, plants, and even the sun are part of this web.

Here’s how it works:

The sunlight comes down to the earth and causes the plants and trees to grow. There is a lot of sunlight, and so plants grow wherever they can to absorb the sunshine. The plants cover much of the earth, and even grow in the water. There are many, many plants. The plants and trees are eaten by numerous kinds of animals. Can you think of some animals that eat plants?

Some of these plant-eaters, or **herbivores**, include insects, deer, and mice. These herbivores eat different parts of the plants. For example, mice like to eat seeds, while deer will actually eat the buds or inner bark of a tree during the winter time. Some herbivores even eat roots (people eat a lot of roots, too - when was the last time you had French fries?)! There are less of these herbivores than there are plants. How come? Think about it. If the herbivores outnumbered the plants, they would eat all those plants up in no time at all!

The animals that eat these plant-eaters are called **carnivores**, because they eat meat. Some carnivores eat meat from animals that have already died. The most well-known of these scavengers is the vulture, which uses its powerful sense of smell to find rotten meat for a tasty dinner. Other carnivores get their food by hunting for it. These hunters are also known as predators, and include animals like the owl and the cougar. As you may guess, there are less of these predators than there are prey animals.

Predators are at the top, or “apex,” of the food web. Some predators are closer to the top than others. For example, lizards are predators that hunt insects for food. Yet, lizards may also be hunted by other predators, such as hawks. So a hawk might be closer to the top of the food chain than a lizard, even though both are types of predators. **These “top predators,” such as the hawks, are often called “apex predators.”**

Through their hunting, the predators actually help the animals and plants. How? They help by making sure that there are not too many herbivores around. Imagine if there were no hawks or cougars - then the mice and deer might eat up all the plants, and run out of food to eat! Predators make sure that everything stays in **balance**; they are an important part of the food web.

Summary:

Predators eat plant-eaters. Plant-eaters eat plants, and plants “eat” the sunlight. There are lots of plants, fewer herbivores, and even fewer carnivores. The predators at the top of the food web depend on all the other animals and plants to survive; they also help the other animals and the plants to stay in balance by thinning the number of herbivores.

California Raptor Species Fact Sheet: Red-tailed hawk

Common Name: Red-tailed hawk

Scientific Name: *Buteo jamaicensis*

Family: Accipitridae (Hawks, Eagles)

Identification: Red-tails are large hawks that soar over open terrain. They can be just over 2' tall in height. Just like other raptor species, female red-tails are larger than males. The chests of red-tailed hawks tend to be white and the backs are darker brown or black in color. The adults have reddish-looking tails. Immature birds lack the red tail, instead having grayish looking tail feathers. They are also more streaked in appearance and lighter in color than the adults.

Range: Red-tails breed throughout North America. They also winter here throughout the country and in much of southern Canada, as well as south to Panama in Central America.

Habitat: These hawks prefer open areas like grasslands, farms, and tundra. They also live in forest areas. A female red-tail will often nest in the same general area year after year, working with her mate to build a stick-nest high up in a tree or on a cliff.

Adaptations: Red-tailed hawks, like other Buteos (similar types of hawks), have round, wide wings for soaring as they hunt. This allows them to save energy by using the wind to lift them without flapping much. They use their wide, short tails to help steer. Like other raptors, red-tails have sharp beaks that are hooked for tearing meat and skin. They also have very strong, sharp talons.

Eating Habits: Red-tailed hawks mostly eat small mammals, including rabbits, mice, and squirrels. They help control the numbers of these rodent populations. These large raptors are not usually fast enough to catch birds. However, they will eat fledgling songbirds in the springtime, which are much easier to hunt. Red-tails also use their hooked beaks to tear open dead deer and other large road-killed animals.

Sounds: The typical call of this hawk is a loud, descending “KEEeer” whistle. They also make other sounds during the mating season. Ravens, crows, and jays often will mob red-tails from above, calling with loud and worried voices. Little songbirds will also pester red-tails, trying to chase the hawks out of their territory. This behavior is common and should be watched for. With some practice, you may be able to tell where a hawk is without even looking, if you listen to the calls of the other birds and animals nearby.

Other Behaviors: Red-tails rely on their keen eyesight for spotting prey. Often, they perch on branches overlooking a meadow. They especially like to sit on the branches of dead trees or even on top of telephone poles. Hawks cough up large pellets full of bones and fur, which are often found beneath their perches.

Predators: Red-tailed hawks may sometimes be attacked and eaten at night by Great-horned owls, a species which tends to share the same type of habitat as this large hawk.

Environmental Needs: Red-tailed hawks need an environment that has clean air, water, and food. Chemicals like pesticides and rodenticides will poison these birds if they catch contaminated rats or other animals. These toxic chemicals collect in the birds' bodies over time, and may lead to illness.

Benefits to the Environment: The average red-tail eats the equivalent of 1200 mice every year. Some kinds of mice can have litters of up to 16 or more babies, every few weeks . . . thousands of mice could be born within a few generations! Hawks and other predators keep these rodents from multiplying out of control!

Odd/Exceptional Facts: Red-tails have been seen eating grasshoppers in large quantities. They have also been known to catch crayfish for a meal.

Sources:

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