



ARIZONA-SONORA
**DESERT
MUSEUM**

FEATHERED FRIENDS

A forty-five minute
Desert Discovery program

To the Teacher:

Thank you for making the *Feathered Friends* program a part of your curriculum. During this exciting interactive educational program, students will handle bird bio-facts and meet live Sonoran Desert birds.

This packet contains pre- and post- program information and activities along with a vocabulary list and suggested resources. These materials were to help you extend this class topic with both introductory and follow-up lessons. The pre-visit information will introduce students to some of the basic concepts presented in *Feathered Friends* and help prepare them for the program. We hope you'll find this information useful and easy to incorporate into your science curriculum. For more information about the Desert Museum and the Sonoran Desert, visit our website at www.desertmuseum.org.

We look forward to working with you and your students.

Sincerely,
ASDM Center for Sonoran Desert Studies
Education Department

PROGRAM OBJECTIVES

Through the examination of hands-on artifacts, live birds, and interactive demonstrations, students will:

- Describe at least four characteristics that are common to birds.
- Demonstrate three different types of bird flight.
- Observe at least three Sonoran Desert birds and determine their adaptations for feeding and movement.
- Describe the unique adaptations of birds of prey.
- Explain how habitat changes affect birds and other wildlife. Describe at least three ways humans affect habitat and how they can improve it.
- Develop an appreciation for the intrinsic value of birds of the Sonoran Desert region.

ARIZONA ACADEMIC STANDARDS IN SCIENCE CORRELATION

The Feathered Friends program and supplemental activities correlate to these Arizona Academic Science Standards. See each activity for specific standards and performance objectives.

SC01-S1C1-02, SC01-S1C3-01, SC01-S1C1-02, SC02-S1C1-01, SC00-S4C3-02, SC01-S4C1-03, SC01-S5C1-01, SC03-S3C1-01, SC03-S3C1-02, SC01-S4C3-03, SC03-S4C3-04, SC02-S4C1-02, SC03-S4C1-01, SC03, S4C4-01, SC02-S1C1-01, SC03-S5C1-01&02, SC02-S4C1-01, SC03-S4C4-01, SC00-S1C2-04, SC01-S1C2-04, SC02-S1C3-02&03&04

Science Standards:

Strand 1: Inquiry Process

Concept 1: Observations, Questions, and Hypotheses

Concept 2: Scientific Testing

Concept 3: Analysis and Conclusions

Concept 4: Communication

Strand 2: History and Nature of Science

Concept 1: History of Science as a Human Endeavor

Concept 2: Nature of Scientific Knowledge

Strand 3: Science in Personal and Social Perspectives

Concept 1: Changes in Environment

Concept 2: Science and technology in Society

Concept 3: Human Population Characteristics

Strand 4: Life Science

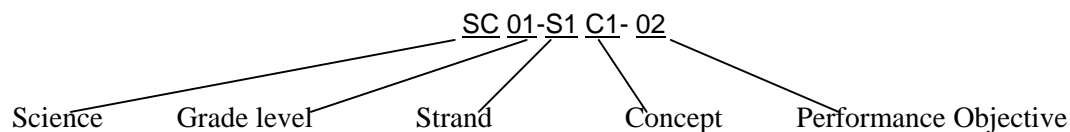
Concept 1: Characteristics of Organisms

Concept 2: Life Cycles

Concept 3: Organisms and Environments

Concept 4: Diversity, Adaptation and Behavior

The shorthand for each standard is read this way:



RESOURCES

Books for Adults:

- Low, Rosemary. *Endangered Parrots*. Butler and Tanner Frome, Somerset. UK. 1984.
- Meinzer, Wyman. *The Roadrunner*. Lubbock, Tex. 1993.
- National Geographic Society. *Field Guide to the Birds of North America*. 2nd ed. 1995.
- Smith, Gussie Thomas. *Birds of the Arizona Desert*. Phoenix, AZ. 1941.
- Walker, Lewis Wayne. *The Book of Owls*. New York. 1974.

Children's Books:

- Bash, Barbara. *Desert Giant*. Sierra Club Book/Little Brown & Co. San Francisco. 1989.
- Biel, Timothy L. *ZooBooks, Hummingbirds*. Wildlife Education, Ltd. San Diego 1985.
- Biel, Timothy L. *ZooBooks, Owls*. Wildlife Education, Ltd. San Diego. 1985.
- Burnie, David. *Eyewitness Books: Bird*. Alfred A. Knopf. New York. 1988.
- Cobb, Vicki. *This Place is Dry: Arizona's Sonoran Desert*. paperback \$7.95
- Dolan, James & Kenton Lint. *ZooBooks, Parrots*. Wildlife Education, Ltd. San Diego 1985.
- Guiberson, Brenda Z. *Cactus Hotel*. Henry Holt & Co. New York. 1991.
- Wexo, John Bonnett. *Zoobooks, Birds of Prey*. Wildlife Education, Ltd. San Diego. 1985.
- Wexo, John Bonnetts . *ZooBooks, Eagles*. Wildlife Education, Ltd. San Diego. 1985.

Activity Books:

- Bonforte, Lisa. *Fifty Favorite Birds* (coloring book). Dover Publications. 1982.
- Braus, Judy, ed. *Ranger Rick's NatureScope, Birds, Birds, Birds!* National Wildlife Federation. 1985 (ordering information: 1 800-722-4726).

Videos: (Often available at public libraries or through your school)

- Saguaro, Sentinel of the Desert. (*The Best of Nature*)
- Birds and Things with Wings. DK Vision.

Organizations:

- Arizona-Sonora Desert Museum: www.desertmuseum.org
- Desert USA: www.desertusa.com/animal.html
- The Nature Conservancy: www.tnc.org
- Tohono Chul Park: www.azstarnet.com/~tcpark.
- Tucson Audubon: www.audubon.org/chapter/az/tucson
- Tucson Botanical Gardens: Tucson, AZ. 326-9686

VOCABULARY

Adaptation - A body part or behavior of an animal or plant that helps it survive in its environment (i.e. An eagle has sharp talons that help it grab and hold its prey.).

Camouflage- Coloration that helps hide a bird from its predator or prey.

Contour feather- An exterior feather that gives shape to the wings, body and tail of a bird.

Desert- An area that is lacking in usable moisture most of the year.

Down- Small, soft feathers close to the body that help keep a bird warm or cool.

Evaporation- Changing from a liquid to a gas.

Habitat- An area in which a plant or animal naturally lives that provides food, water, shelter and space.

Ornithology- The study of birds.

Predator- An animal that kills other animals for food (not an enemy).

Preen- To straighten, oil, fluff and clean feathers.

Prey- An animal that is hunted for food by a predator.

Raptor- A predatory bird that usually has a curved beaks and sharp talons.

Talons- A predatory bird's claws.

Pre-Program Activities

TEACHER BACKGROUND INFORMATION – A LOOK AT THE SONORAN DESERT

BIRD PARTS AND FEATHER FEATURES

Students will identify parts of a bird's anatomy by completing an activity sheet; realize that birds have different beaks, wings and feet; identify parts of a feather.

THE CACTUS WREN – THE DESERT NOISEMAKER

Students will learn about the natural history of the cactus wren and complete a puzzle.

Post-Visit Activities

BEAKS, FOOD AND TOOLS





Students will use a variety of tools to simulate different types of bird beaks to find out how size and shape of the beak is related to food items gathered.

ZOOMING IN ON BIRDS

Students will make pretend binoculars and take a bird walk to observe birds' adaptations and behaviors.



Major North American Deserts

-  Great Basin Desert
-  Mojave Desert
-  Sonoran Desert
-  Chihuahuan Desert

A Look at the Sonoran Desert

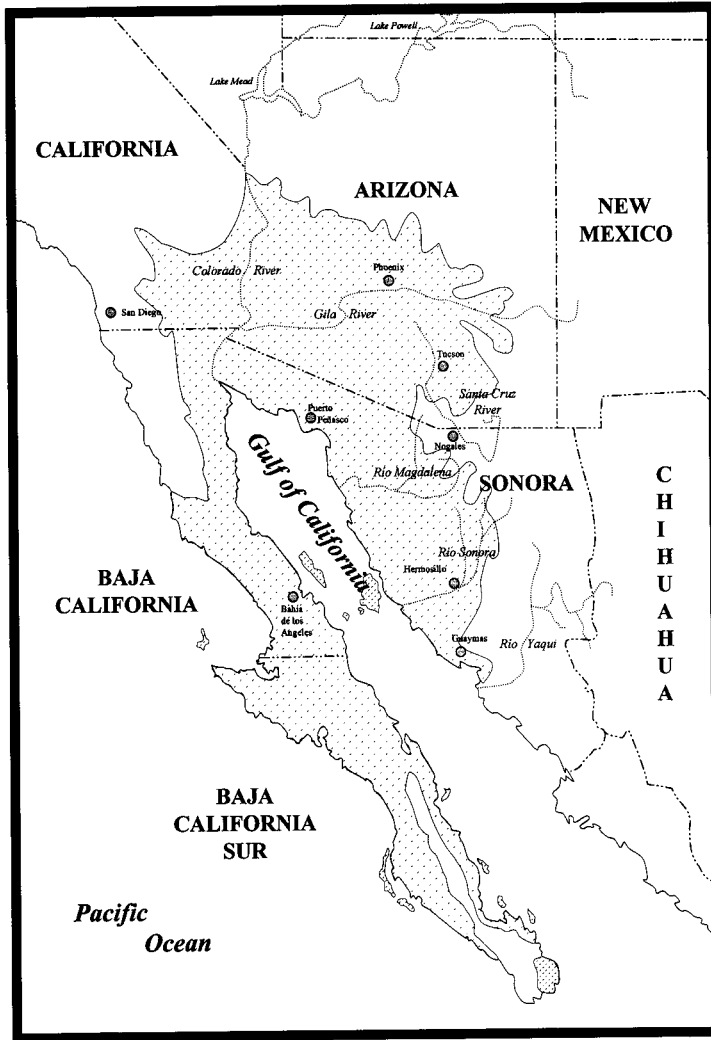
Background Information for Teachers

The Arizona-Sonora Desert Museum is located in the Sonoran Desert. This desert is one of four that occur in North America. The other three are the Great Basin, Mojave and Chihuahuan deserts. Arizona is the only state in which all four deserts can be found.

What Is A Desert?

All deserts share a common factor – they are dry! Little rain falls in the desert, often less than 10 inches per year. The rain that does fall may come in sudden large bursts from a violent desert thunderstorm. Much of this water runs off the soil into washes or evaporates before it has a chance to soak into the ground. This leaves little water for plants and animals.

Other characteristics of deserts include windy conditions, intense sunlight, unpredictable and changing amounts of annual rainfall, and great differences between day and night temperatures (days may be hot, but nights may be much cooler).



The Sonoran Desert

The Sonoran Desert, for the most part, is a low, hot desert. Parts of this desert get less than 3 inches of rain a year! Winters are mild and summers are hot. Summertime temperatures may reach 120°F. Tucson and the area surrounding the Arizona-Sonora Desert Museum get an average of 11.4 inches of precipitation per year. Rainy seasons vary throughout the desert, but in our area, the rainy seasons usually come twice a year, in the late summer and winter.

The Sonoran Desert is quite lush when compared to other deserts of the world. It contains over 2,000 different species of flowering plants alone. *Columnar* cacti (such as saguaro and organ pipe) and *legume* trees (such as mesquite, palo verde, acacia) visually dominant the landscape.

*The Arizona-Sonora Desert Museum is a great place to visit to learn more about the natural history of this fascinating region. The Desert Museum displays only the plants and animals of the Sonoran Desert Region. This region includes the desert itself and the non-desert communities found next to – or within -- the desert. These other communities include **riparian** corridors (lush areas along streams), pine-topped mountain islands and desert grasslands.*

Feathered Friends Desert Discovery Program

The Sonoran Desert contains a diversity of plant and animal life adapted to thrive in the desert. An adaptation is any physical, physiological or behavioral trait or characteristic that enables an organism to survive and reproduce in its environment. Desert birds have evolved a variety of adaptations. Birds have a naturally high body temperature, so they are slower to feel the heat than other animals. When it becomes hot, a bird can cool itself by evaporating water through its respiratory tract and mouth. Therefore, a bird that has an open mouth and appears to be panting is cooling its insides!

Birds can escape drought by flying to water. Some species, such as the black-throated sparrow and Gambel's quail, seem to be able to survive with little or no free water. However, even these birds will drink water if available. During dry periods, these and other bird species will meet their need for moisture by eating succulent plants and /or insects. Like reptiles, a bird's best water conservation technique is the excretion of semi-solid uric acid (white wash). Unlike most mammals, birds do not need much water to eliminate waste.

Other adaptations exhibited by different groups of birds include specialized wings, beaks and feet. Examples of these adaptations are described in the activities that follow.