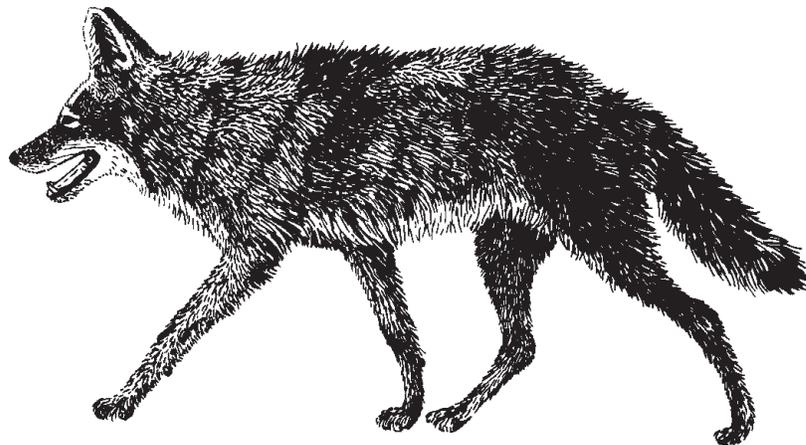


A WALK IN THE DESERT

TEACHER IDEA PACKET

DESERT TREK OUTREACH PROGRAM
FOR KINDERGARTEN



Presented by the



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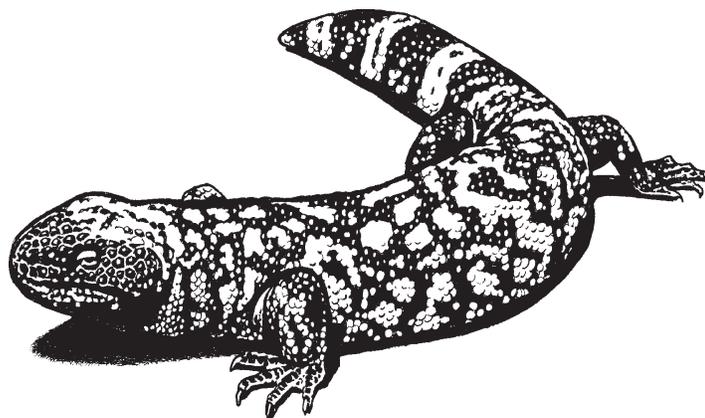
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A Walk in the Desert

A forty five minute science program
for students in kindergarten

To the Teacher:

Thank you for making the *A Walk in the Desert* Outreach Program a part of your curriculum. During this exciting interactive educational program, students will meet some live Sonoran Desert animals! **Please be sure to review the enclosed Desert Trek Outreach Program Confirmation sheet for instructions on preparing your room and students for this program.**

This packet contains pre- and post- program information and activities along with a vocabulary list and suggested resources. These materials were developed 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 *A Walk in the Desert* 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 welcome and value your comments and suggestions concerning this program and the corresponding Teacher Idea Packet. At the end of the program, we will give you an evaluation form and would appreciate your taking the time to complete it within a week and mail it back to us. If you develop lessons or activities related to this topic that work well with your students, we would appreciate your sending us a copy. We will give you credit for any materials we use.

We look forward to working with you and your students at your school.

Sincerely,
ASDM Education Department

CLASS OBJECTIVES

Through the examination of live animals, artifacts and interactive demonstrations students will:

- Develop an understanding of the physical characteristics of a desert.
- Identify some common Sonoran Desert plants and animals.
- Determine the adaptations of specific desert plants and animals that enable them to live in the Sonoran Desert environment.
- Develop an appreciation for our desert and the creatures that inhabit it.
- Determine measures they can take to help conserve our desert ecosystem.

ARIZONA ACADEMIC STANDARDS IN SCIENCE CORRELATION:

Desert Trek Outreach Program: 1SC-R3, 4SC-R3, 4SC-F4

Pre- and Post-Program Activities: 1SC-R2, 1SC-R3, 4SC-R2, 4SC-R3, 4SC-F4

RESOURCES

Arizona-Sonora Desert Museum Press: (publications for adults)

These may be ordered directly through our website (www.desertmuseum.org) or by contacting the ASDM publications manager at 883-3028.

- Arizona-Sonora Desert Museum: *A Natural History of the Sonoran Desert*. Tucson: ASDM Press, 1999.
- Friederici, Peter. *Strangers in our Midst, The Startling World of Sonoran Desert Arthropods*. Tucson: ASDM Press, 1996
- Hanson, Jonathan and Roseann Beggy Hanson. *Desert Dogs: Coyotes, Foxes, and Wolves*. Tucson: ASDM Press, 1995.
- Lazaroff, David. *Arizona-Sonora Desert Museum Book of Answers*. Tucson: ASDM Press, 1998.
- Lazaroff, David. *The Secret Lives of Hummingbirds*. Tucson: ASDM Press, 1995.
- Merlin, Pinau. *A Field Guide to Desert Holes*. Tucson: ASDM Press, 1999.

Children's Books:

- Albert, Richard E.: *Alejandro's Gift*. San Francisco, Chronicle Books, 1994.
- Cobb, Vicki. *This Place Is Dry*. New York: Walker, 1989.
- Skramstad. *Wildlife Southwest*. San Francisco: Chronicle Books, 1992.
- Urquhart, Jennifer C. and Barbara Gibson. *Creatures of the Desert World*. Washington, D.C.: National Geographic Society, 1987.
- Wiewandt, Thomas. *The Hidden Life of the Desert*. New York: Crown Publishers, 1990.
- Zoehfeld, Kathleen Weidner. *Cactus Café. A Story of the Sonoran Desert*. Norwalk, Ct: Soundprints, 1997.

Activity Book:

- Braus, J., ed. Ranger Rick's Nature Scope: *Discovering Deserts*. Washington D.C.: National Wildlife Federation, 1985. (For ordering information call:1-800-722-4726)

Organizations:

- **Arizona-Sonora Desert Museum:** 2021 N. Kinney Rd., Tucson, AZ 85743. Phone: (520) 883-3025. www.desertmuseum.org
- **Desert USA:** www.desertusa.com/animal.html [This site contains information on many desert plants and animals, including photos.]
- **Tucson Audubon Society:** www.audubon.org/chppter/az/tucson
- **Sonoran Arthropod Studies Institute (SASI):** (520) 883-2578

VOCABULARY

Adaptation - Body features or behaviors that help a creature survive in its environment (i.e. an eagle has sharp talons that help it grab and hold its prey.)

Camouflage - An animal's color pattern that helps it blend in with its surroundings.

Desert - An area low in moisture for most of the year.

Evaporation - Changing from a liquid to a gas.

Habitat - The place in which an animal or plant lives that provides the food, water, shelter, and space needed for its survival.

Nocturnal - Active at night.

PRE-PROGRAM INFORMATION AND ACTIVITIES

Teacher Background Information: A LOOK AT THE SONORAN DESERT (pp. 3-4)

This short reading provides you with some background information on the Sonoran Desert Region and an introduction to the topic of your outreach program.

Activity 1: ANIMAL ADAPTATIONS TO THE DESERT (pp. 5-7)

This series of activities introduces students to desert aridity and the process of evaporation. Students learn how some desert animals are adapted to this dry, often hot, environment.

Activity 2: WHAT'S IN A HABITAT? (pp.8-9)

Introduce students to the elements of a habitat with a cut-and-paste activity sheet that focuses on animal homes.

POST-PROGRAM INFORMATION AND ACTIVITIES

Activity 3: DESERT ILLUSTRATION

After students participate in *A Walk in the Desert* Outreach Program, have them draw a Sonoran Desert scene, complete with some of the animals and plants they just learned about. Students can also draw, color, and cut out desert plants and animals and glue these on a large sheet of paper to create a class collage.

Activity 4: SONORAN DESERT PUPPETS AND MASKS (pp. 11-12)

Using the enclosed templates, students make finger puppets and masks of desert animals. Discuss each animal's adaptations to the desert and for feeding. What does each eat? (Scorpions are nocturnal, feeding on insects and other small arthropods which are killed or subdued by venom injected through the stinger at the end of the "tail." The screech owl is nocturnal and eats insects and other invertebrates along with small mammals, such as mice. Mountain lions are predators, living in the mountain regions of the Sonoran Desert, eating primarily deer and other mammals.)

Activity 5: SONORAN DESERT ABC'S (p. 13)

Students create alphabet cards that depict life in the Sonoran Desert.

Activity 6: IN THE SHADE OF THE SAGUARO (pp. 14-15)

Students learn a song about common Sonoran Desert animals.

A LOOK AT THE SONORAN DESERT

Background Information for Teachers



Major North American Deserts

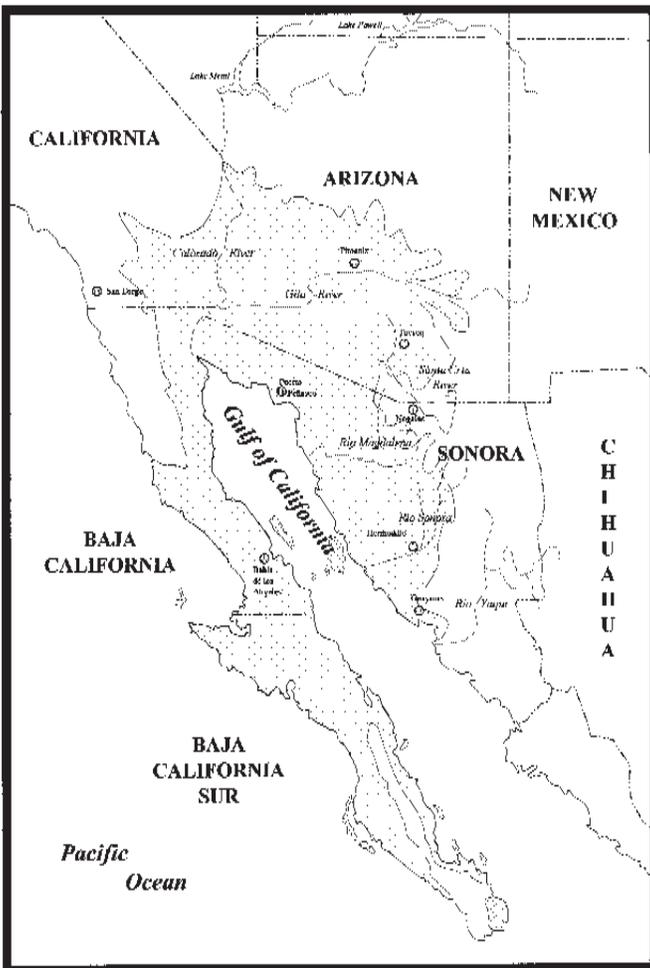
-  *Great Basin Desert*
-  *Mojave Desert*
-  *Sonoran Desert*
-  *Chihuahuan Desert*

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 dominate the landscape.

The Arizona-Sonora Desert Museum is an excellent 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.

Desert Plants and Animals

There are many different kinds of plants and animals in the Sonoran Desert. Life thrives here because organisms are **adapted** to this environment. They have ways of surviving the lack of water and hot summer days. Many are so well adapted to the desert that they could not survive anywhere else!

In this outreach program, students will learn about climatic stresses of the desert environment, then take an imaginary “walk” in the desert to discover the adaptations of some common plants and animals we meet along the way.

1. ANIMAL ADAPTATIONS TO THE DESERT

Students perform experiments and activities to understand Sonoran Desert animals' adaptations to their environment.

ARIZONA SCIENCE STANDARDS
4SC-F4, 1SC-R2

OBJECTIVES

Students should:

- Identify adaptations of animals that allow them to live in specific environments.
- Formulate questions about objects, organisms, events and relationships in the natural world.

MATERIALS

- Copy of *Student Handout - Animal Adaptations to the Desert* for each student
- Buckets of water
- Paper towels
- Chalkboard
- Markers or crayons

VOCABULARY
Adaptation
Evaporation

BACKGROUND

Organisms adapt to their environment. Desert environments pose interesting challenges for survival, and desert animals have developed unique adaptations for living here.

SETTING THE STAGE

- 1) Dip a paper towel in a bucket of water and wring the excess water into the bucket. Take the moistened paper towel and wipe it across the chalkboard. Watch the moisture begin to disappear. Ask the students, "What happened to the water?" (It evaporated into the air.) Explain that here in the desert, it is hot and dry, and water disappears or **evaporates** into the air all the time.
- 2) Ask the students, "What kinds of things does water evaporate from?" (clothes on a line, puddles, pavement, etc.) If they don't think of it, ask the students, "Does water evaporate from plants and animals, too?" (yes)
- 3) Ask, "Do you think it is hard for living things to live in the desert where there is not much water and it evaporates away?" (yes) "How do they survive?" (They should generate examples of how animals/plants are able to survive in the desert.)
- 4) Explain that these are examples of **adaptations** – body parts or actions – that help animals and plants live here. Tell them you will be going outside to do a series of activities to demonstrate adaptations that desert animals have to help them live in the desert.



ADAPTATION ACTIVITIES

ADAPTATION 1: RESTING IN SHADE OR IN A BURROW, ACTIVE AT NIGHT

- 1) Bring the buckets of water and paper towels outside. Find a spot where pavement is in sunshine and in shade.
- 2) Have the students dampen and ball up a paper towel and write their initials on the pavement on both the sunny side and shady side. Ask them to closely observe which one dries up more quickly. (the one in direct sunshine) Ask, "What does this tell you about the sunny side?" (that water dries up more quickly in the sun) "Which side feels hotter?" (the sunny side)
- 3) Ask, "If you were an animal living out in the desert, what might you do to keep cool and try not to lose much water?" (rest in the shade at the hottest times of day, come out when it is cooler)
- 4) Explain that many desert animals are active either at night or in the cooler hours of the day. They pass the heat of the day resting in deep shade or down in burrows out of the sun.

ADAPTATION 2: PANTING OR SWEATING

- 1) Ask the children: "What happens to us when we get hot and our body tries to cool us down?" (We sweat.) "How does sweating cool us off?" (Our sweat evaporates and cools us.)
- 2) To illustrate this, have the students roll up their sleeves and dip one arm in the bucket of water, leaving the other arm dry. Have them wave both arms in the air. Ask: "Which arm is cooler? Why?" (Evaporation on the

1. ANIMAL ADAPTATIONS TO THE DESERT



ANSWER KEY TO THE DESERT ADAPTATIONS HANDOUT

There are six adaptations, covered in the activities and discussion above, depicted in the handout.

- a fox in its den in the heat of the day
- a javelina resting in the shade beneath a tree
- a kangaroo rat active at night
- a bird panting
- a desert tortoise resting in its burrow and storing water in its bladder
- a jackrabbit sitting in the shade and cooling its blood through its big ears

The black bear does not belong in the picture.

wet arm cools the air down around the arm, making it feel cooler.) “Do you think very many desert animals sweat?” (no) Why?” (Possible answer: few desert animals sweat because there is so little water to drink to replace the water lost.)

- 3) But there are other ways to keep cool. Ask, “What do dogs do to keep cool?” (pant) Explain that when they pant, dogs’ blood is cooled as it passes through their tongue because water evaporates from dogs’ tongues and cools them down. Coyotes, mountain lions, birds, and many other desert animals pant to cool down.

DISCUSSION

- 1) Return to the classroom. Pass out *Student Handout - Animal Adaptations to the Desert* to each student. Point out that part of the picture represents daytime, the other part night. Ask the children to look at the picture and describe the adaptations they see that animals have to save water and keep cool. (They should notice those already discussed – a fox in its den in the heat of the day, a javelina resting in the shade beneath a tree, a bird panting, a kangaroo rat active at night. Have them circle these.)
- 2) Ask, “Can you see any other animal adaptations for life in the desert in this picture?” (The desert tortoise and jackrabbit are both resting in the shade. These animals have other desert adaptations as well. Desert tortoises store water in their bladders and can go a long time without drinking, but when it is hot they retreat to their burrows. Jackrabbits rest in the shade and use their big

ears to cool down their blood. Their warm blood circulates into their ears and is cooled when exposed to the cooler air.) Point out these animals in the picture, explaining their adaptations. Have the children circle them.

- 3) Then ask, “Which animal does not seem adapted to the desert?” (The black bear.) “Why?” (It has thick hair and is out in the sunshine in the middle of the day.) Have them put an X over the bear.

- 4) Have the students color the picture. Remind them to distinguish between day and night.

EXTENSION

CREATE A DESERT CREATURE!

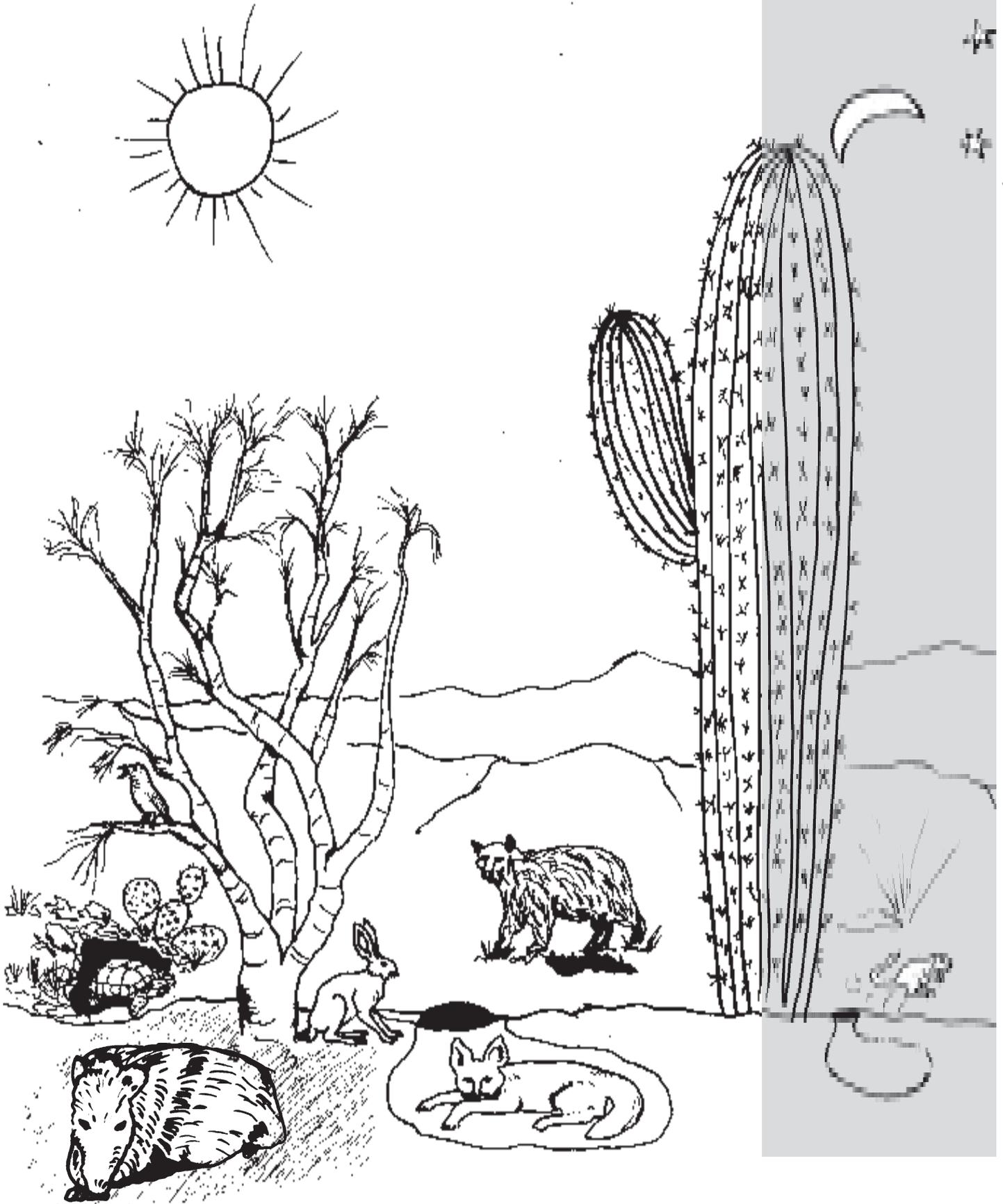
The students can create and draw their own animal or plant with its own adaptations for desert survival. Have them share their creations with each other to see if others can figure out the creatures’ adaptations.



NAME _____

STUDENT HANDOUT

ANIMAL ADAPTATIONS TO THE DESERT



2. WHAT'S IN A HABITAT?

Introduces the elements of habitat with a cut-and-paste worksheet that focuses on animal homes.

ARIZONA SCIENCE STANDARDS

1SC-R2, 1SC-R3,
4SC-R2

OBJECTIVES

Students should:

- List the elements of a habitat (food, water, shelter, space.)
- Understand that the amount and availability of these elements can change over time.

MATERIALS

- *Student Handout - Who's at Home?* for each student
- scissors
- glue
- markers
- crayons

VOCABULARY

Habitat

GETTING READY

Make a copy of *Student Handout - Who's at Home?* for each student.

DOING THE ACTIVITY

SETTING THE STAGE

- 1) Present the idea of **habitat** by asking the students "What do you need to live?" Without much prompting, they should all list examples of foods they eat and the fact that they all drink water.
- 2) The other elements of habitat, shelter and space, may be less obvious. Ask the students, "In what sort of place do each of you live?" (a house, apartment, etc.) "Why do you live in these places?" (for protection from cold, heat, rain, or sun, or danger.) Explain that many living things take shelter in some way. Some make it, some find it, and some develop body parts to protect themselves. Ask the students, "Can you think of an animal that builds a shelter or home for itself or its babies?" (a bird, a mouse, etc)
- 3) Ask one of the students, "How many rooms does your house/apartment have? Do you think it would be okay if all of us came and moved in there with you? Why not?" (No. It would be too crowded.) Explain that just like we all have separate houses (or shelter) around town and do not share them with the whole class, all living things need the space to make their homes and find the food and water they need to live.
- 4) Explain that these are the things that make up a **habitat**: the area where an animal or plant lives and finds the food, water, shelter, and space it needs for survival.

ACTIVITY: WHO'S AT HOME?

- 1) Give the students a copy of *Student Handout - Who's at Home?* and instruct them to color the desert scene with its animal homes and each animal.
- 2) Have them cut out the different animals and paste them in the correct homes.

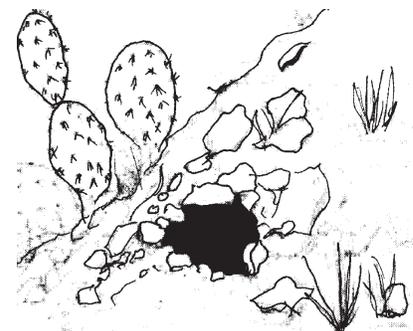
WHO'S AT HOME? (ANSWERS)

See the corresponding names of homes on the handout.

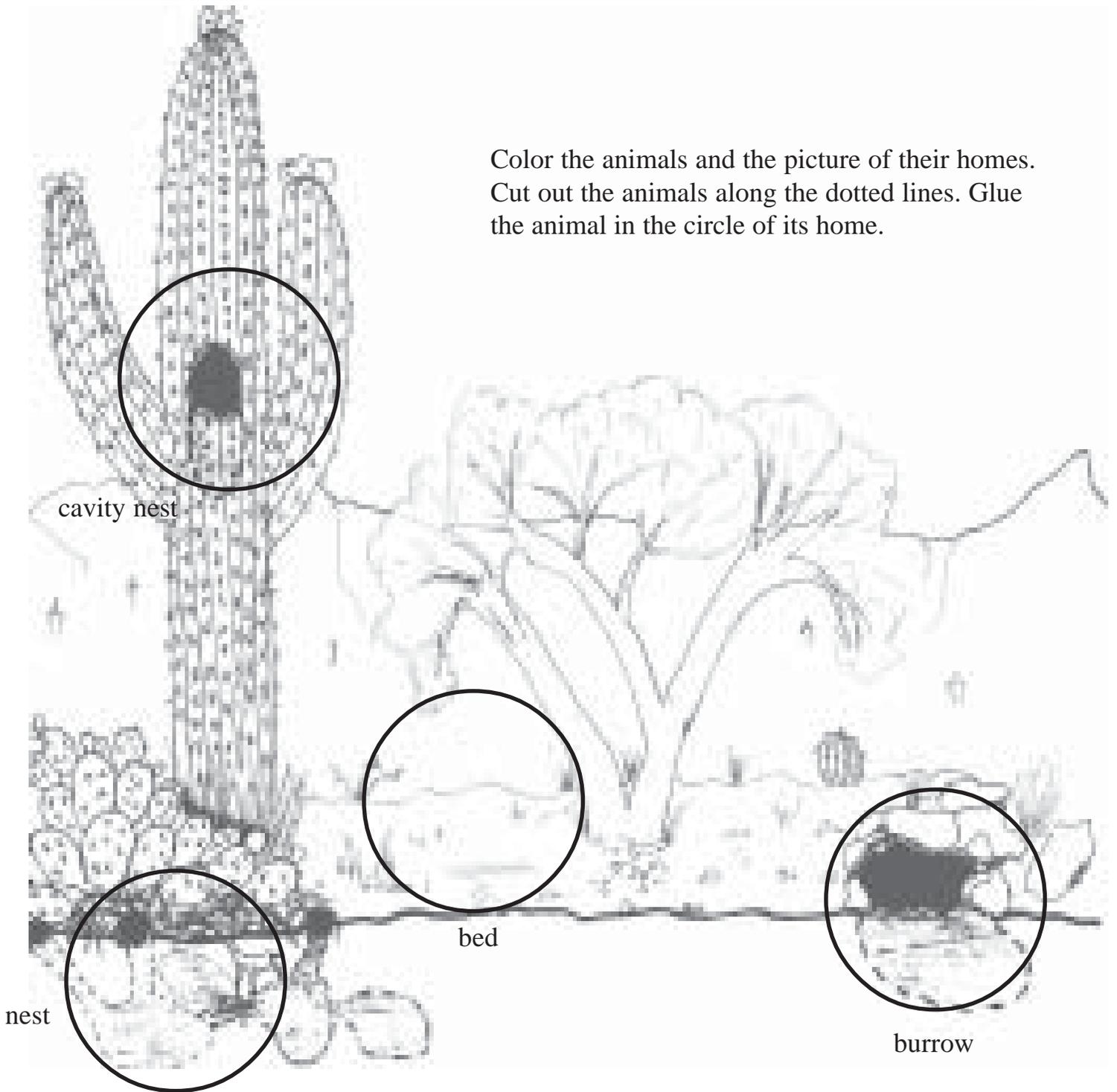
- 1) Desert Tortoise (underground burrow in rocky outcropping)
- 2) Javelina (bed in the shade beneath palo verde tree)
- 3) Pack Rat (nest under prickly pear at foot of saguaro, tunnels underground)
- 4) Elf Owl (cavity nest in saguaro)

DISCUSSION

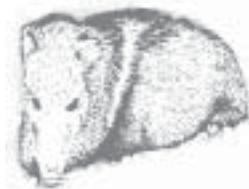
Discuss the homes of the different animals in the pictures as a group. Where do the animals make their homes? What might be the advantages or disadvantages of certain types of homes?



Color the animals and the picture of their homes.
Cut out the animals along the dotted lines. Glue
the animal in the circle of its home.



tortoise



javelina

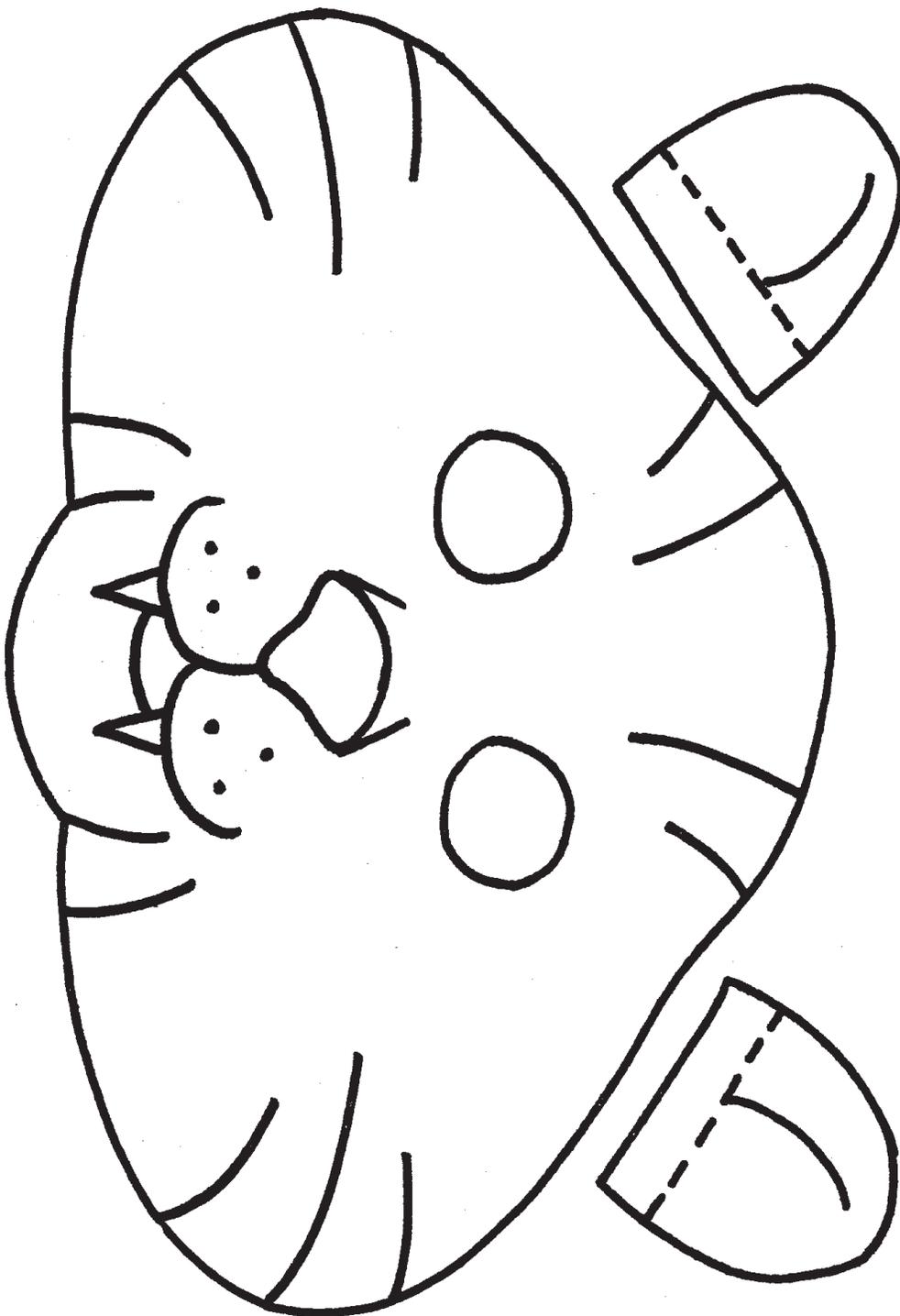


pack rat



elf owl

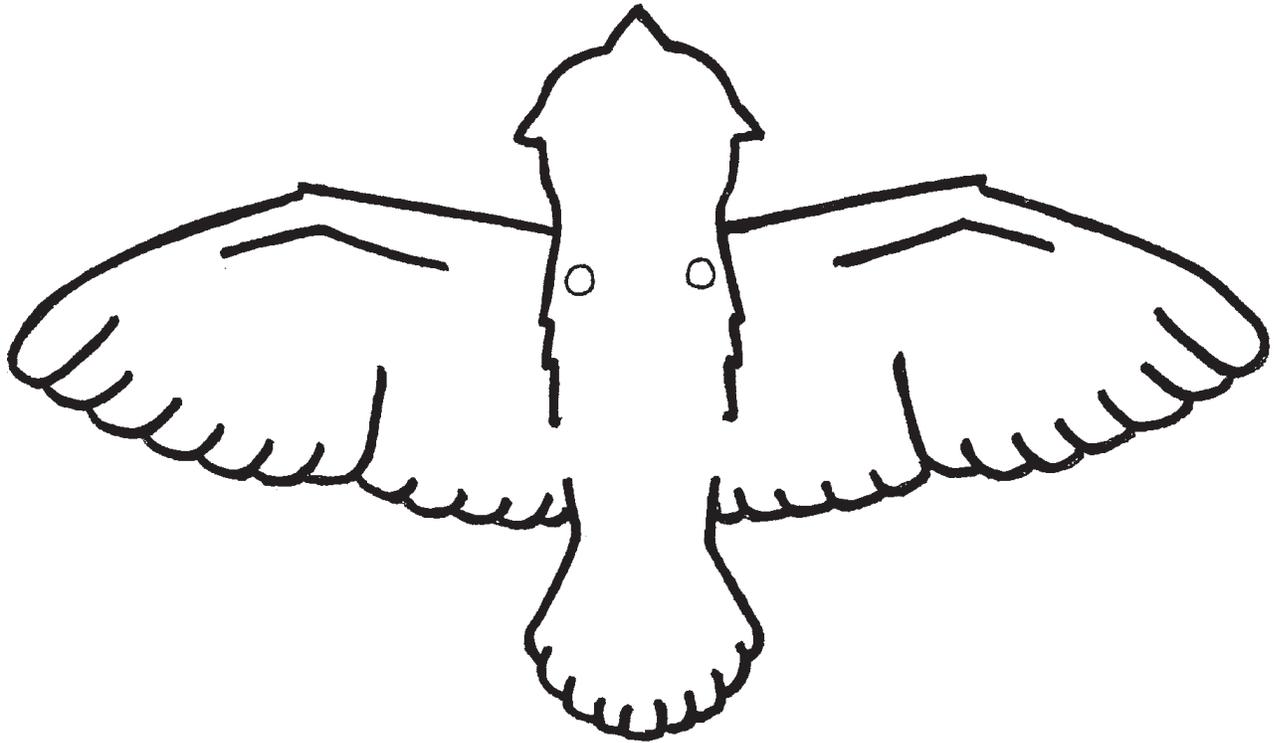
MOUNTAIN LION CRITTER MASK PATTERN



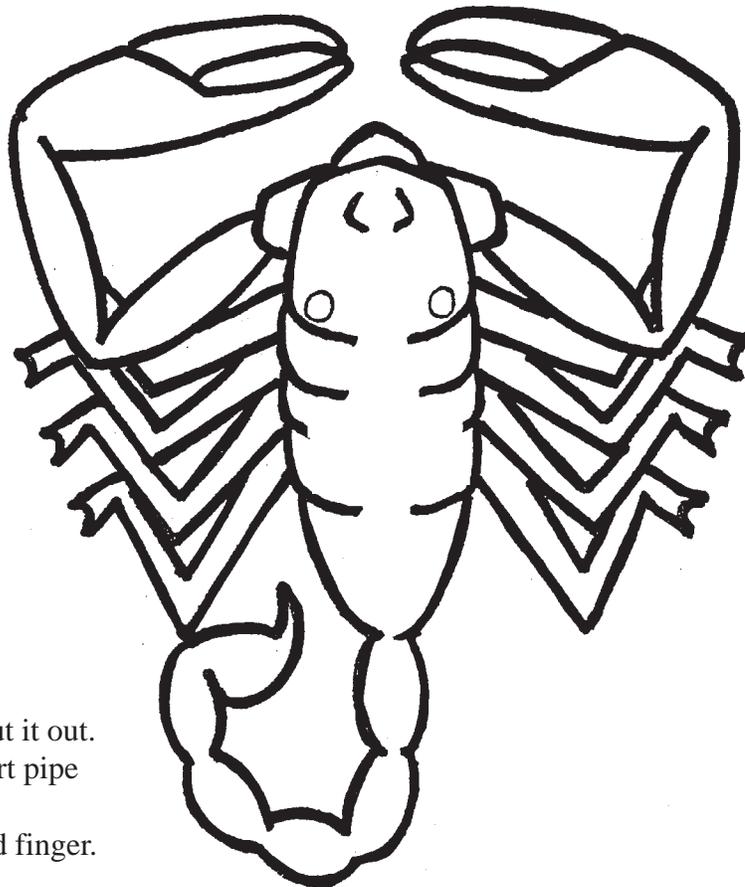
Directions

1. Photo copy mask on card stock. (If using copy paper, glue to oak tag.)
2. Color mask and cut it out.
3. Carefully cut out the holes for the eyes.
4. Cut out strips of paper for whiskers. Glue these on the mask.
5. Glue ears in place.
6. Staple a string or cloth strip to the sides to fit head.

SCREECH OWL FINGER PUPPET PATTERN



SCORPION FINGER PUPPET PATTERN



Directions

1. Color each puppet and cut it out.
2. Punch out holes and insert pipe cleaners.
3. Wrap pipe cleaner around finger.

5. SONORAN DESERT ABC'S

Students create alphabet cards that depict life in the Sonoran Desert Region.

ARIZONA SCIENCE STANDARDS 1SC-R3

OBJECTIVES

Students should:

- Demonstrate knowledge of many of the animals and plants they have studied in the outreach program and supplemental activities.
- Create card games to share with each other and other classes.

MATERIALS

- blackboard
- 3 x 5 index cards, blank (3 or more for each student)
- sample alphabet cards, made by teacher before the activity
- construction paper
- scrap paper
- pencils
- markers
- crayons
- paints
- scissors
- masking tape

GETTING READY

Prepare the materials as listed in the materials column on the left of this page. Color your sample alphabet cards ahead of time, or create your own during class.

DOING THE ACTIVITY

SETTING THE STAGE

Through the previous activities and the outreach program, your students should have a large repertoire of words which represent the plants, animals, and life zones of the Sonoran Desert Region. This activity lets you review what they have seen and learned.

- 1) Ask the students "What plants and animals did the teachers from the Desert Museum talk about and show us?" List their observations on the blackboard. Have them brainstorm a list of everything they can think of that they might find in the Sonoran Desert Region. Tell your students that the class is going to make alphabet cards based on all the exciting discoveries they have made.
- 2) Organize their words alphabetically, and try to come up with something for each letter. For example, A= agave B= bat, boojum C= cactus wren, coyote D= dust, dinosaur bones and so on.

MAKING CARDS

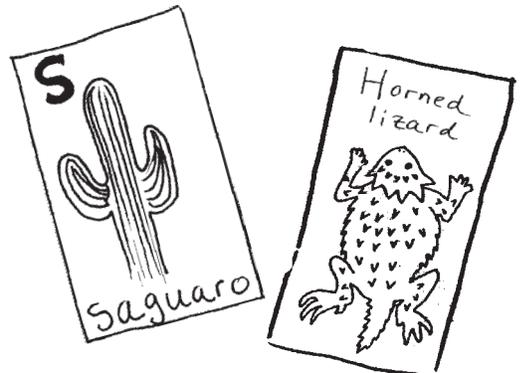
- 1) Show the students the sample cards you made and have them select some of the items on the class list to make into their own alphabet cards. Encourage them to be creative and not limit themselves to your examples.
- 2) Have the students draw the picture of their plant or animal on the card and color it, then write the first letter of the animal or plant on the top of the card.

CARD GAMES

- 1) When they finish, ask them to write their names on the back of their cards.
- 2) In small groups or as a whole class, create patterns with the cards. Lay out the example cards and students' cards in patterns so the cards:
 - spell out a name of something in the Sonoran Desert
 - list the entire alphabet
 - depict categories that represent things found in the desert such as plants, animals, geologic features, minerals, native foods, etc.
- 3) You can arrange them on tables or tape them to a bulletin board or chalk board in order. Other ideas for ways to use the cards include:
 - create a new card game
 - collect and trade cards with other participants or other classes
 - create a collage that represents a story of the Sonoran Desert

Things we find in the Sonoran Desert

A = agave
B = bat, boojum
C = cactus wren, coyote
D = dust, dinosaur bones
E = elf owl
F = flower, fishhook cactus



6. IN THE SHADE OF THE SAGUARO

“In the Shade of the Saguaro” is one of the many Sonoran Desert songs for kids written by Patty Horn, a Tucson songwriter and musician. Patty has produced 3 tapes/CD’s and song books with a wonderful variety of songs about animals, plants, and people of the Sonoran Desert. Patty’s songs are a great way to entertain and teach about the Sonoran Desert. Her CD’s include vocal tracks and backing (instrumental only) tracks. For a complete listing of tapes, CD’s, songbooks, and how to order, look at the website: <http://www.pattyhorn.com>, or write/call the following: e-mail, music@pattyhorn.com, phone (1-888-219-1735), fax (1-520-577-8006), or mail: Two Geckos Music & Publishing, PO Box 30274, Tucson, AZ 85751.

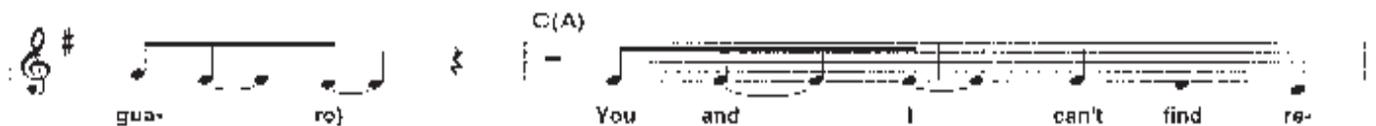
IN THE SHADE OF THE SAGUARO



A good friend of mine, Terri, asked me to write a song about the shade of the Saguaro and all the desert animals that enjoy it everyday. You can look outside her kitchen window any time of the day and see our desert friends in the shade of her saguaros. It's quite a sight!

Play C or Play A: Capo 3

Music and Lyrics by: Patty Horn © 1994



G(F)
Hee! But in the shade, (in the

D7(B7)
shade) of the Sa-gua-ro, (Sa-gua-ro)

C(A) D7(B7) G(E)
just look a-round and you will see!

C(A)
Verse 1: The ground squirrels will rest af-ter dig-ging all day. The

G(E) C(A)
quail will sing their song in the cool, cool, shade. The liz-ards take a break in the

D7(B7)
af-ter-noon. The Ja-ve-lin-a eat till their

D.S. of Coda
bel-lies are full! In the

VERSE 2:
 C(A) The rattlesnake will hide in the shady spot
 G(E) The woodpeckers peck their holes close to the top
 C(A) The cactus wren nest way down deep inside
 D7(B7) The coyote sing on a moonlit night! (Repeat Chorus)