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# ADAPTING TO DESERT LIVING

## ADAPTIONARY

### Activity Summary

Students will learn about specific adaptations which help the plants and animals of the Sonoran Desert environment survive. The class will play a game called Adaptionary in which students guess what a particular adaptation is used for.

### Bringing it Together

In the previous activity, students learned about some of the common plants and animals of the Sonoran Desert. It is not our objective to have students name as many plants or animals as they can, but to understand how these creatures interrelate in the desert community as well as how they survive in the desert environment. The focus of this activity is on the adaptation of plants and animals to desert conditions and other survival issues.

#### Objectives

Students will:

- list five survival necessities to which plants and animals in the desert develop adaptations.
- describe and give examples of animal and plant adaptations for feeding, moving, protection, conserving water, and keeping cool.

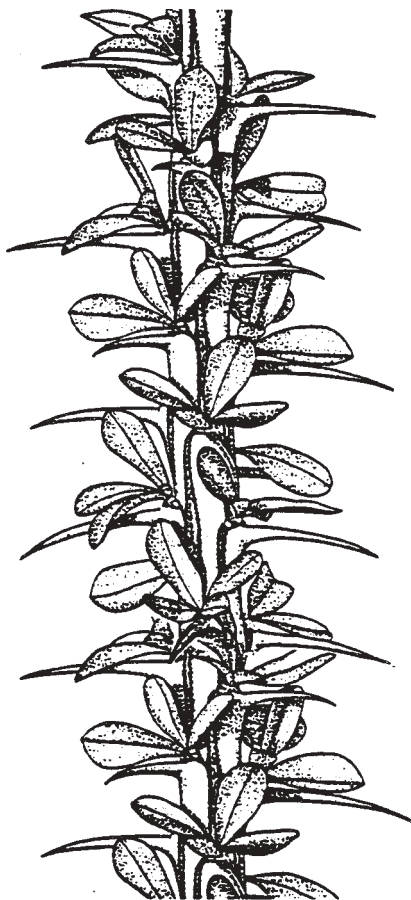
#### Materials

- Adaptionary Playing Cards (cards should be cut out along the dotted lines from the masters provided)
- Timer or watch with a second hand
- Chalk board

A good way to introduce students to the concept of adaptation is to ask them how they spend a hot summer day in the Sonoran Desert. Most of the answers (as discussed in the first activity) involve actions or behaviors that we take to avoid

the desert sun. That is, humans generally make behavioral adaptations in response to heat. Animals as well, often alter their behavior to adjust to intense heat situations. They may seek out shade, drink more water, or become inactive. Besides changing behavior to adapt to a situation, many animals and plant have physical features which allow them to adapt to environmental conditions. Humans living in the desert can and have learned a lot about desert survival from studying the ways native plants and animals have adapted to desert living.

The game Adaptionary is a fun way to aid students in learning about the concept of adaptation. In addition to introducing adaptations to desert conditions (such as various methods of conserving water and keeping cool) Adaptionary also introduces adaptations for moving, feeding, and protection.



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## Rules for Adaptionary

The game should be played with two teams. A person from the first team picks an Adaptionary card. That person takes a moment to study the card and then has two minutes to draw the adaptation described on the card. The student should first say what kind of adaptation it is (for feeding, moving, protection, conserving water, or keeping cool) then draw the adaptation on the chalk board in front of the entire class. From the time the student starts to draw, their team has two minutes to guess the adaptation (similar to the game Pictionary) thus, team members should try to guess the adaptation while it's being drawn. As team members say one of the words or portion of the word of the adaptation, the teacher should write the word on the board. It will be up to the discretion of the teacher to determine if and when the adaptation has been adequately stated. If the team does not guess the adaptation, the other team has two chances to guess it. Other points may also be awarded to the first team to think of other animals or plants (other than the example or examples used in the drawing) that have the same adaptation. After each round, the teacher should conduct a brief discussion of the animals or plants that exhibit the specific adaptation and how it helps them to survive. The teams should alternate turns until all cards are used. The team with the most points is the winner.

### Key Point:

The *adaptation* described on the card is more important than the *animal* exhibiting the adaptation (e.g., “long, sticky tongue for catching insects” is what the student should guess first, not “spade-foot toad” or “a horned lizard”). Hint: It might be best to begin the drawing with the adaptation first, then add the rest of the plant or animal.

### Note to teachers:

Two minutes may not be enough time for your students to draw and guess the adaptation. Please use your discretion and select a time most appropriate for your class.

## Activity Procedure

1) Begin this activity with a discussion on adaptation. Emphasize the following points:

Adaptations are physical or behavioral features which help animals and plants survive in their environment.

**Behavioral adaptations** involve changes in the way something acts. Animals (including humans) have control over what they do. An individual conscientiously alters its behavior to adjust to changing environmental conditions. As an example, humans exhibit behavioral adaptations (such as moving into the shade) when responding to a hot day in the desert.

**Physical adaptations** involve actual physical or chemical attributes which help a plant or animal survive in its particular environment. Examples include webbed feet to help such animals as a duck or a frog swim, tiny leaves and a waxy coating to help a plant conserve water, a strong, decurved beak to aid a hawk in ripping meat.

2) Have the students suggest their own examples of animal and plant adaptations which they may recall from their Desert Dweller cards and list them on the board (e.g., wings for soaring, sticky tongue, hard shell, tiny leaves, long ears, etc.) If you choose, students may refer to their Desert Dweller cards. To assist you in organizing your thoughts and ideas before conducting the Adaptionary game, a "Teacher's Guide to Adaptionary Playing Cards" page has been provided.

Separate from the adaptations you have just listed, write the following words on the board:

***Feeding***

***Moving***

***Protection***

***Conserving Water***

***Keeping Cool***

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## Taking it Home and Other Extensions

Have students consider variations of the game such as drawing the animal or plant and students guessing as many different adaptations as they can for that one animal or plant (e.g., a saguaro has spines for keeping cool and protection, and it can store water or a red-tailed hawk has wide, fanned wings for soaring, keen eyes for spotting prey, strong beak for ripping meat, strong talons for capturing prey, etc.). Keep score in a different way such as instead of having teams, allow individuals to guess the adaptation and when they do, they get a point and they get to go up and draw a card.

Have students *act out* the adaptation as the others guess (like charades).

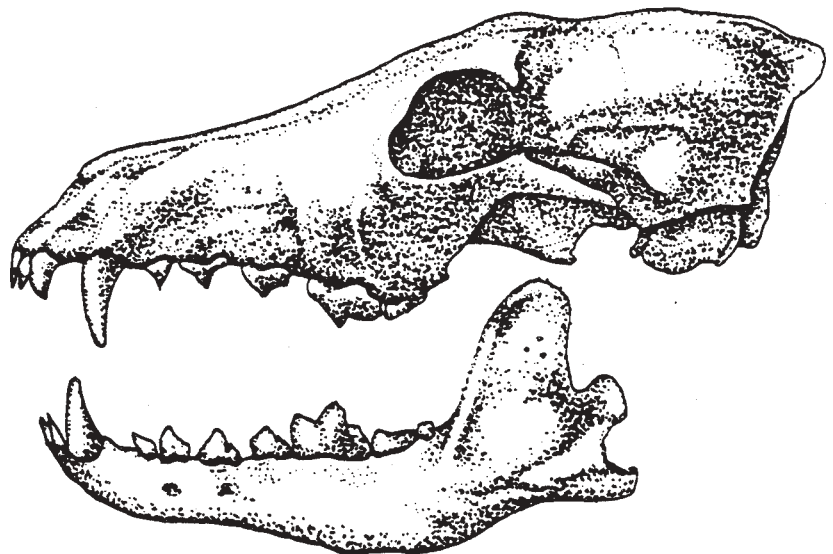
Student may research and create their own Adaptionary playing cards.

After playing the game, go outside with the students to search for animal and plant adaptations. Sit as a class in one location or allow students to go off in teams to investigate adaptations. Have students note the animal or plant, what it's doing, and what physical features assist it in its adaptation. Encourage students to notice adaptations of plants and animals in the desert on their own after school. Have them take notes on these adaptations in their Juntos Journals.

While outside, play "ISpy" Adaptations (e.g., "ISpy a plant conserving water", "ISpy an animal moving with fast-flapping wings.")

3) Explain that these five things are among the necessities of survival for plants and animals of the desert. Review a few of the adaptations and have the students decide if it is an adaptation that helps an animal or plant do one of those things listed on the board. Try to think of at least one adaptation for each of the categories. Point out that the adaptations which were listed on their Desert Dweller cards fall into one or more of these categories should they want to refer back to their cards for assistance. Explain that next, the class is going to play a fun game to help them learn more adaptations of desert plants and animals. They will be using the same categories of adaptations in a game called "Adaptionary".

4) Bring out the deck of "Adaptionary" playing cards and review the rules of the game (described in the side bar of the adjacent page). Photocopy a set of the cards before cutting them up for use in the activity to ensure that you will have a set for next year. Divide the class into two teams. Team members should sit in a group together. Play the game until all the cards have been used or you run out of time.



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# Teacher's Guide to Adaptionary Playing Cards

## Feeding

large eyes to aid in night vision  
long bill for sipping nectar  
sharp teeth for tearing flesh  
strong, sharp claws (talons) for grasping prey  
long, sticky tongue for catching insects  
good sense of smell to detect rotting meat

great horned owl  
hummingbird  
coyote  
red-tailed hawk  
spade-foot toad  
turkey vulture

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## Moving

stays in a shady area during hot summer days  
wings move in a figure eight to allow hovering  
wide fanned wings for soaring  
two toes point forward two behind for running  
long legs for jumping  
scales on belly to move body forward

javelina  
hummingbirds  
red-tailed hawk or turkey vulture  
roadrunner  
jackrabbit, kangaroo rat  
all snakes

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## Protection

hard outer shell for protecting a soft body  
camouflage coloration to escape detection  
spines for protecting succulent insides  
rattle on its tail to warn intruders  
squirts blood from its eyes  
long legs for speedy get-a-ways

desert tortoise, cicada  
horned lizard  
cholla, prickly pear, saguaro  
rattlesnake  
horned lizard  
black-tailed jackrabbit

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## Conserving Water

tiny leaves to reduce water loss  
expandable body for storing water  
efficient kidneys to reduce waste water  
waxy coating on leaves to prevent water loss  
drops its leaves when very dry  
gets most of its water from the food it eats

mesquite, palo verde, ironwood  
saguaro, barrel cactus  
kangaroo rat  
jojoba, creosote bush  
ocotillo, ironwood, mesquite, palo verde  
packrat, kangaroo rat

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## Keeping Cool

big ears for cooling  
long spines to create shade  
long toes to move high above the hot ground  
digs an underground burrow  
active at night to conserve water  
lives underground until it rains

jackrabbit, mule deer, cottontail  
cactus, ocotillo  
lizard  
desert tortoise, harvester ant  
packrat  
spade-foot toad

# ADAPTIONARY PLAYING CARDS

<p>KEEPING COOL</p> <p>big ears for cooling</p> <p>jackrabbit, mule deer, cottontail</p>	<p>KEEPING COOL</p> <p>long spines to create shade</p> <p>saguaro, cholla, prickly pear</p>
<p>KEEPING COOL</p> <p>long toes to move high above the hot ground</p> <p>lizard</p>	<p>KEEPING COOL</p> <p>digs an underground burrow</p> <p>desert tortoise, harvester ant</p>
<p>KEEPING COOL</p> <p>active at night to conserve water</p> <p>packrat</p>	<p>KEEPING COOL</p> <p>lives underground until it rains</p> <p>spade-foot toad</p>

# ADAPTIONARY PLAYING CARDS

<p>PROTECTION</p> <p>hard outer shell for protecting a soft body</p> <p>desert tortoise, cicada</p>	<p>PROTECTION</p> <p>camouflage coloration to escape detection</p> <p>horned lizard</p>
<p>PROTECTION</p> <p>spines for protecting succulent insides</p> <p>cholla, prickly pear, saguaro</p>	<p>PROTECTION</p> <p>rattle on its tail to warn intruders</p> <p>rattlesnake</p>
<p>PROTECTION</p> <p>squirts blood from its eyes</p> <p>horned lizard</p>	<p>PROTECTION</p> <p>long legs for speedy get-a-ways</p> <p>black-tailed jackrabbit</p>

# ADAPTIONARY PLAYING CARDS

<p>FEEDING</p> <p>large eyes to aid in night vision</p> <p>great horned owl</p>	<p>FEEDING</p> <p>long bill for sipping nectar</p> <p>hummingbird</p>
<p>FEEDING</p> <p>sharp teeth for tearing flesh</p> <p>coyote</p>	<p>FEEDING</p> <p>strong, sharp claws (talons) for grasping prey</p> <p>red-tailed hawk</p>
<p>FEEDING</p> <p>long, sticky tongue for catching insects</p> <p>spade-foot toad</p>	<p>FEEDING</p> <p>good sense of smell to detect rotting meat</p> <p>turkey vulture</p>

# ADAPTIONARY PLAYING CARDS

<p>MOVING</p> <p>stays in shady areas on hot summer days</p> <p>javelina</p>	<p>MOVING</p> <p>wings move in a figure "8" to allow hovering</p> <p>hummingbirds</p>
<p>MOVING</p> <p>wide fanned wings for soaring</p> <p>red-tailed hawk, turkey vulture</p>	<p>MOVING</p> <p>two toes pointing forward, two behind for running</p> <p>roadrunner</p>
<p>MOVING</p> <p>long legs for jumping</p> <p>jackrabbit, kangaroo rat</p>	<p>MOVING</p> <p>scales on belly to move forward</p> <p>all snakes</p>



# ADAPTIONARY PLAYING CARDS

<p>CONSERVING WATER</p> <p>tiny leaves to reduce water loss</p> <p>mesquite, palo verde, ironwood</p>	<p>CONSERVING WATER</p> <p>expandable body for storing water</p> <p>saguaro, barrel cactus</p>
<p>CONSERVING WATER</p> <p>efficient kidneys which waste less water</p> <p>kangaroo rat</p>	<p>CONSERVING WATER</p> <p>waxy coating on leaves to prevent water loss</p> <p>jojoba, creosote bush</p>
<p>CONSERVING WATER</p> <p>drops its leaves when very dry</p> <p>ocotillo, ironwood, mesquite, palo verde</p>	<p>CONSERVING WATER</p> <p>gets most of its water from the food it eats</p> <p>packrat, kangaroo rat</p>

