

Assignment Discovery Online Curriculum

Lesson title:

Desert Animals

Grade level:

6-8, with adaptation for older students

Subject area:

Life Science: Ecology

Duration:

Three 40-minute class periods

Objectives:

Students will understand the following:

1. To survive within an ecosystem, an animal must be physically and behaviorally adapted to the conditions of its environment.
2. Animals living in the desert have physical and behavioral characteristics that make them well adapted to the desert environment.

Materials:

- 4" x 6" index cards (three for each student)
- Pencils and paper
- Small chalkboards or dry-erase boards and appropriate writing utensils
- Reference materials about deserts and desert animals, including library books, encyclopedias, and Internet resources
- Copies of Take-Home Activity Sheet: A Day in the Life

Procedures:

1. In this lesson, students will learn about desert animals and their adaptations through individual research and by participating in a classroom activity called "Adaptation Jeopardy!" Before class begins, create a list of desert creatures on which the number of creatures is equal to the number of students in your class. Make sure that the creatures you choose fall into the following four categories: mammals, birds and fish, reptiles and amphibians, and insects and spiders. Examples of desert animals include geckos, roadrunners, ravens, turkey vultures, gila monsters, camels, and desert iguanas. For a larger list, check out these Web sites:

<http://www.desertusa.com/animal.html>

<http://mbgnet.mobot.org/sets/desert/animals/index.htm>

2. Begin your lesson with a class discussion of desert biomes. Discuss with students what they already know about deserts. Has anyone ever driven through a desert? Has anyone camped in a desert? What special things do people need to do to take care of themselves in the desert? (Examples include turning on air-conditioning in the car and bringing extra water.) Ask students to name famous deserts around the world (such as the Sahara in Africa, the Gobi in Asia, and the Sonoran in North America), then review common characteristics of deserts:
 - Deserts are very dry, receiving little rainfall (less than 10 inches annually).
 - Deserts are generally very hot in the daytime (often more than 100 degrees Fahrenheit), but they can be cold at night (50 degrees Fahrenheit and colder).
 - Deserts may receive only a few episodes of rainfall in a year.
3. Now review animal adaptations with your class. Explain that for any animal to survive within an ecosystem, it must be physically and behaviorally adapted to the conditions of its environment. Make sure students understand that physical adaptation refers to physical characteristics such as fur, eyes, and color and that behavioral adaptation refers to characteristics such as hunting strategies, breeding patterns, and social habits that help an animal cope with the conditions it faces.
4. Assign one desert creature from your list to each student. Then hand out three blank index cards to each student and have students write the names of their desert animals on one side of each card. Explain that these cards will be used as “game cards” in a special Jeopardy game about desert animal adaptations.
5. Tell students that they will use print and online resources to research and identify three adaptations for their animals. On the back of each index card, students should write one adaptation and follow it with an explanation of how it helps the animal survive. Explain that these adaptations will be used as clues, so they should not reveal the name of the desert animal. For example, an adaptation could read, “This animal sleeps underground during the day.” Allow students time to research and work quietly on their index cards. Tell students they will hand in their index cards by the end of the class period.
6. Before class concludes, collect the index cards and pass out copies of the Take-Home Activity Sheet: A Day in the Life to each student. In this assignment, students must write an essay on a day in the life of the animal on their index cards from the perspective of the animal. Have students include several physical and behavioral adaptations of their animal in the story and explain why these adaptations are necessary for the animal to survive within a desert biome. Explain to students that they will share their essays during the next class period in a short presentation to the class.
7. Begin the next class period by inviting students to share their essays with the rest of the class. Students may choose to read their essays aloud or summarize the animal and its adaptations. Encourage students to take notes, explaining that they'll be using these facts to

play a special Jeopardy game. After each student has finished his or her presentation, write the name of the creature on the board and review with the class what the animal's adaptations are. When the presentations are finished, discuss the differences and similarities among the desert animals the class has studied. Remind students to listen well and ask questions so they will be prepared for the next day's game of Adaptation Jeopardy!

8. The next day, before students enter the classroom, create four columns on the board. Label the columns with the four categories of desert creatures assigned: Mammals, Birds & Fish, Reptiles & Amphibians, and Insects & Spiders. Using tape or adhesive, post one index card from each student under the correct category, with the adaptation details facing out. (Since each student should have submitted three index cards, you should be able to play three rounds of the game.)
9. Arrange students into groups of four or five. The groups will compete against one another in the game Adaptation Jeopardy! Explain to the class that groups will take turns guessing what animal matches the adaptation listed on an index card; for example, if a card reads, "This animal has a double set of eyelashes to keep out the sand," the correct answer is "What is a camel?" Award 10 points for each correct answer, keeping score on the board. Each group controls the board until its members make an incorrect answer. If a student receives one of his or her own cards, the student must pass and play the next round.

Adaptation for older students:

Have older students research desert plants as well as desert animals. Tell students to focus on the specific habitat and range where their plant or animal is found. Then discuss how desert life varies among deserts around the world. How do deserts around the world differ? How are these differences reflected in the plant and animal adaptations?

Questions:

1. In recent years, humans have had a significant negative impact on natural habitats. Many animal species have not been able to adapt quickly enough to the changes humans have brought to environments around the globe. As a result, more than a thousand species of animals are in danger of extinction. The bobcat's shrinking habitat in the American Southwest is one example. Discuss whether and how humans can prevent the bobcat and other endangered desert animals from becoming extinct.
2. The Pima are Native Americans who live in the Sonoran Desert region in Arizona. They grow extensive bean and corn crops. Hypothesize about the adaptations they might have made to grow their crops and survive in the desert.

3. Describe one of the many relationships that exist between particular animals, including insects (which are animals), and species of plants living in the desert.
4. How do abiotic factors (sunlight, water, and other nonliving things) influence biotic factors (living things such as plant and animal life) in a desert environment?
5. Desertification is the process by which land becomes desert. As the greenhouse effect intensifies, average temperatures increase and deserts grow larger. What kinds of behavioral adaptations might people need to make in the future as the environment becomes warmer?
6. Discuss the adaptations animals make to their environments in your community. What are the abiotic factors in those environments? How do people and animals survive? (For example, your dog sleeps during the hottest part of the day, and you drink more water in the summer.)

Evaluation:

You can evaluate your students on their assignments using the following three-point rubric:

Three points: complete descriptions of desert animal's physical and behavioral characteristics; clear, well-reasoned explanations of how the animal is adapted for life in the desert

Two points: partial descriptions of animal's physical and behavioral characteristics; fairly clear explanations of how the animal is adapted for life in the desert

One point: partial descriptions of animal's physical or behavioral characteristics; some explanation of how the animal is adapted for life in the desert

You can ask your students to contribute to the assessment rubric by determining how many characteristics should be mentioned in the descriptions.

Extension ideas:

Creature Features

Having students work individually or in small groups, give each student or group a small sponge saturated with water. Tell students that this sponge represents a desert animal with a limited amount of available water. The job of each group or individual student is to conserve the animal's water. Students will need to take care of their "creatures" over a 24-hour period using only natural materials. Their creatures must be in the open to feed for at least four hours during that time. Discuss which "adaptations" students made that were successful in conserving water.

Danger: Extinction

In the late 1960s, the takhi, or the Gobi Desert's wild horse, was nearly driven to extinction. How did humans contribute to this near extinction? How did we later save the herd? Do other animals face similar threats? Research the reintroduction of the takhi to the Gobi.

Suggested Reading:

Desert (Biomes of the World series)

Edward R. Ricciuti. Benchmark Books, 1996.

Welcome to the dry hot world of deserts. The formation of deserts and the unique species of plants and animals that thrive there are covered in this title. Interesting highlights appear in colored insets, and color photographs are used to illustrate the text. The final chapter covers threats to the desert environment from various human activities.

The Kalahari

Rose Inserra and Susan Powell. Heinemann, 1997.

The Kalahari Desert covers an immense area in Africa, from Gabon, near the equator, to South Africa. Using photographs and diagrams, the distinctive and varied terrain that makes up this vast expanse is explored, as well as the wildlife and groups of people who live there.

Vocabulary

adaptation

Definition: A physical or behavioral characteristic of an organism that helps it survive in its biome.

Context: The camel's double eyelashes are an example of an **adaptation** that helps it to survive in a habitat with heavy sandstorms.

biodiversity

Definition: Biological diversity in an environment as indicated by the numbers of different species of plants and animals.

Context: The desert's **biodiversity** encompasses thousands of species of animals.

camouflage

Definition: To conceal by disguise.

Context: The buzzard did not spot the kangaroo rat, which was **camouflaged** against the golden sand.

extinct

Definition: No longer existing.

Context: Some animals become **extinct** because they are not able to adapt to changing factors in their habitats.

habitat

Definition: The place an animal lives within an ecosystem.

Context: The gecko has the ability to camouflage itself, which helps it survive in its **habitat**.

nocturnal

Definition: Active at night.

Context: Many animals are **nocturnal** in order to avoid the heat of the daytime.

Academic standards:

Grade level: 6-8

Subject area: Life Science

Standard:

Understands biological evolution and the diversity of life.

Benchmark:

Knows basic ideas related to biological evolution (e.g., the diversity of species is developed through gradual processes over many generations; biological adaptations, such as changes in structure, behavior, and physiology, allow some species to enhance their reproductive success and survival in particular environments).

Grade level: 6-8

Subject area: Life Science

Standard:

Understands relationships among organisms and their physical environment.

Benchmark:

Knows factors that affect the number and types of organisms an ecosystem can support (e.g.,

available resources; abiotic factors such as quantity of light and water, range of temperatures, and soil composition; disease; competition from other organisms within the ecosystem; predation).

Grade level: 6-8

Subject area: Life Science

Standard:

Understands relationships among organisms and their physical environment.

Benchmark:

Knows ways in which organisms interact and depend on one another through food chains and food webs in an ecosystem (e.g., producer/consumer, predator/prey, parasite/host, and mutually beneficial or competitive relationships).

Credit:

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A Day in the Life

Desert animal:

Range (continent, region):

Directions: Write a short description of a day in the life of your desert animal. Include details about where your animal sleeps, what it eats, and the physical and behavioral characteristics that are important to its survival.