Biomes: Adapting to Deserts & Other Ecosystems

Grade Level: 6-8	**Subject:** Ecology	**Duration:** Three 40-minute class periods

Objectives

Students will

- discover that an animal must be physically and behaviorally adapted to the conditions of its environment to survive; and
- learn how desert-dwelling animals have physical and behavioral adaptations suited to their environment.

Materials

- 4" x 6" index cards (three for each student)
- Small chalkboards or dry-erase boards and appropriate writing utensils
- Reference materials about deserts and desert animals, including library books, encyclopedias, and Internet resources

Procedures

1. Students will learn about the adaptations of desert animals through individual research and the classroom activity "Adaptation Jeopardy." Before class begins, create a list of desert animals; the number should equal the number of students in the class. Choose animals from these four categories: mammals, birds and fish, reptiles and amphibians, and insects and spiders. Examples include geckos, roadrunners, ravens, turkey vultures, gila monsters, camels, and iguanas. For more animals, visit these Web sites:

   http://www.desertusa.com/animal.html
   http://mbgnet.mobot.org/sets/desert/animals/index.htm

2. Hold a class discussion of desert biomes. Ask students what they know about deserts, in particular what people must do to take care of themselves in the desert. *(Answers include drinking extra water and wearing sunblock.)* Ask students to name deserts around the world *(examples: the Sahara in Africa, the Gobi in Asia, the Sonoran in North America);* then review their common characteristics:

   - Deserts receive less than 10 inches of rainfall annually.
   - Deserts may receive only a few rainfalls in a year.
   - Deserts are generally very hot in the daytime (often more than 100º F, or about 38º Celsius), but they can be cold at night (50º F, 10º Celsius, or below).

3. Explain that for any animal to survive, it must be adapted physically and behaviorally to its environment. Tell students that physical adaptation refers to characteristics such as fur, eye structure, and color. Behavioral adaptation refers to hunting strategies, breeding patterns, and social habits.

4. Assign one animal from your list to each student. Then hand out three index cards to each student and have students write the names of their desert animals on one side of each card. Explain that the cards will be used in Adaptation Jeopardy, a game about desert animal adaptations.

5. Tell students that they will use print and Internet reference materials to research and identify three adaptations for their animals. On the back of each index card, students should write one adaptation and an explanation of

how it helps the animal survive. (Example: “This animal sleeps underground during the day.”) Explain that these adaptations will be used as clues in the game, so students should not reveal the name of the desert animal on this side of the card. Allow students time to complete their cards. Tell students to hand in their cards by the end of the class period.

6. Collect the cards and distribute copies of the card to each student. Students must write a paragraph about a day in the life of their animals, including adaptations and why the adaptations are necessary to survive in a desert biome. Tell students they will present their paragraphs during the next class period.

7. Invite students to share their paragraphs. Encourage the class to take notes, explaining that they'll be using these facts to play the game. After each presentation, write the name of the animal on the board and review its adaptations. After all the presentations, discuss the differences and similarities among the animals.

8. The next day, label four columns on the board: mammals, birds and fish, reptiles and amphibians, and insects and spiders. Tape one index card from each student in the correct category, with the adaptation details visible.

9. Arrange students into groups of four or five. Explain that groups will take turns trying to name the animal whose adaptation is on the card. Answers should be phrased as questions. For example, for “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. A group controls the board until they make an incorrect answer. A student receiving his or her own card must pass and play the next round.

Evaluation

Use the following three-point rubric to evaluate students' work during this lesson.

- **Three points:** Students wrote complete descriptions of a desert animal's physical and behavioral characteristics and clear, thoughtful explanations of how the animal is adapted to life in the desert.
- **Two points:** Students wrote partial descriptions of a desert animal's physical and behavioral characteristics and somewhat clear explanations of how the animal is adapted to life in the desert.
- **One point:** Students wrote partial descriptions of a desert animal's physical or behavioral characteristics and incomplete explanations of how the animal is adapted to life in the desert.

Vocabulary

adaptation
Definition: A physical or behavioral characteristic of an organism that helps it survive in its biome
Context: A camel's double eyelashes are an adaptation that helps it live in an nvironment that has fierce sandstorms.

biodiversity
Definition: The number and variety of organisms found within a specified geographic region
Context: The desert has great biodiversity because thousands of animal species live there.

camouflage
Definition: To conceal by disguise or protective coloring
Context: The vulture did not spot the kangaroo rat, which was camouflaged against the sand.

extinct
Definition: No longer existing
Context: Some animals have become extinct because they did not adapt to changes in their habitats.

habitat
Definition: The place an animal or plant normally lives
Context: The gecko can camouflage itself, which helps it survive in its habitat.

nocturnal
Definition: Active at night
Context: Many animals are nocturnal so they can avoid daytime heat.

Academic Standards

The National Academy of Sciences provides guidelines for teaching science as well as a coherent vision of what it means to be scientifically literate for students in grades K–12. To view the standards, visit http://books.nap.edu.

This lesson plan addresses the following national standard:

- Life Science: Populations and ecosystems

Credit

Discovery School staff (based on lesson plan by Jessi Hempel, Bay Area School Reform Collaborative, former teacher)