



SeaWorld/Busch Gardens Animal Adaptations

9-12 Classroom Activity

Design an Ecosystem

OBJECTIVE

The student will describe various adaptations and how they enable the organism to survive in its habitat.

ACTION

1. Explain that the students will create a model of an ecosystem with several species of plants and animals. Some ecosystem suggestions are desert, arctic, tropical, marine, wetland, freshwater, etc. Students may work in groups of four and each group must select a different ecosystem to research.
2. Instruct students to define their ecosystem clearly. They must describe the ecosystem and locations where it may be found. The students should have a photocopy of a world map and highlight the areas that the ecosystem may be found.
3. Next, students must identify five plant species and ten animal species living in the ecosystem. The following information must be included about the native plants and animals. See the teacher's example page for a sample.

<u>Plants</u>		<u>Animals</u>	
Division	Genus	Range	Genus
Division description	Species	Habitat	Species
Range	2 Adaptations	Diet	Reproduction
Habitat	Description	5 Adaptations	Size/Weight
Life Span	Size	Life Span	Description

4. Instruct students to create a model of their ecosystem using clay, construction paper, pictures, drawings, markers, etc.
5. The students will present their models to the class and explain all plant and animal species to the class as well as how they are adapted for their environment. Additionally, the students should describe the ecosystem's energy flow (food web) and the importance of biodiversity. (Plants and animals are connected, and a disruption in one part of the food web will affect other areas.)

BACKGROUND INFORMATION

Every animal must eat to survive, and in every ecosystem there are predators and prey. To understand the relationship and delicate balance between predators and prey, scientists use a tool called a food chain. A food chain is a diagram that shows the transfer of energy via “who eats whom” in an ecosystem.

In a single ecosystem there may be many food chains that interconnect in many ways. A combination of food chains is called a food web. Food webs show us that if one population is impacted by environmental changes, many others will also be affected.

MATERIALS

Per student:

- one ounce of clay (any color)
- construction paper
- markers
- Internet or library access
- photocopy of world map



Ecosystems such as mountain meadows and ocean kelpbeds support a variety of life.

Teacher Example Page

Fennec Fox

Genus: *Vulpes* Species: *zerda*

Description: The smallest of foxes with enormous ears, a tiny face, and a pointed snout.

The fennec fox is cream in color with a long (3/4 head and body length) black-tipped tail.

Range: Northern Africa, throughout the Sahara Desert, East to the Sinai Peninsula and Arabia.

Habitat: Desert and semi-desert

Diet: Mostly carnivorous; insects, snails, lizards, rodents, birds, eggs, and plant matter (fruits and berries).

Gestation: 50 days. The fennec fox can have two litters per year if the first litter is lost and the food supply is plentiful. This is very unusual among the canids. Normally 2-5 young are born per litter.

Size/ Weight: head and body: 14-16 inches long; tail: 8 inches; height at the shoulders: 8 inches. 3-3 ½ lbs.

Life span: averages about 10-12 years

Status: CITES Appendix 2

Adaptations:

1. Their large ears, which are usually 4 to 6 inches long, help dissipate excess body heat on hot days in the desert.
2. The fennec fox seems to be the only carnivore living in the Sahara Desert able to survive without free water. Their kidneys are adapted to restrict water loss, their extensive burrowing may cause the formation of dew, which can then be consumed, and they will receive moisture from the food that they eat.
3. Their burrowing and nocturnal lifestyle helps restrict water loss.
4. Their thick fur helps insulate them from the cold desert nights.
5. Their sandy coloration helps to reflect heat, and also provides excellent camouflage.
6. Fennec foxes also have thick fur on the soles of their feet, which insulate against the hot sand of the desert. This extra fur on the soles of their feet also affords them excellent traction in the loose sand.

California Barrel Cactus

Division: Magnoliophyta Division Description: Flowering plants

Genus: *Ferocactus* Species: *cylindraceus*

Range: Sonoran and Chihuahuan deserts of southern California

Habitat: Desert areas

Description: Spines are dense, light yellow to bright red hiding most of the plant barrel.

Flowers appear in July and August and are orange, red, or yellow in color.

Size: 4-8 feet

Life Span: Perennial= present at all seasons of the year (without interruption).

Adaptations:

1. Spines of the cactus protect it from browsing desert herbivores.
2. Waxy coating of the plant that surrounds the skin prevents evaporative water loss.