Red Butte Garden
THE UNIVERSITY OF UTAH

ETHNOBOTANY: PEOPLE AND PLANTS

Lesson 4: Amazing Adaptations

Utah Core Curriculum Alignment 4th Grade Science Standard 5:	Intended Learning Outcomes: Science
Students will understand the physical characteristics of Utah's wetlands, forests, and deserts and identify common organisms for each environment. **Objective 2:** Describe the common plants and animals found in Utah environments and how these organisms have **adapted** to the environment in which they live	• Observe simple objects and patterns and report their observations. • Sort and sequence data according to a given criterion • Make simple predictions and inferences based upon observations. • Compare things. • Use observations to construct a reasonable explanation. • Record data accurately when given the appropriate form and format. • Use available reference sources to obtain information.

Enduring Understandings

Each of Utah's native (indigenous) plants and animals have adapted to the particular biome in which they reside in a variety of ways by the process of natural selection.

Essential Questions

How have the plants found in each of the three biomes: wetlands, deserts, and forests, adapted for survival?

Background Information

Natural selection is the means by which organisms "adapt" to survive. It is sometimes referred to as "survival of the fittest", but does not necessarily mean the fittest in the sense of the strongest or fastest. A characteristic that helps an organism survive or improve its function in a given environment will be passed on to offspring. The trait is passed on because more organisms with that survival characteristic will survive and be able to reproduce. They are, then, able to pass it on to their offspring. This is how adaptation takes place. Plant and animal

adaptations are characteristics evolved over time in response to conditions of the environment. Adaptation is an ongoing process of evolution.

Lesson Plan

Materials

BB = Materials included in Botany Bin

- BB plant specimens in rikers
- BB blackline of Table of Adaptations (front and back). You will need six two-sided copies.
- BB three sets of Plant Adaptations to Three Biomes, laminated
- BB Answer Key: Plant Adaptations to Biome Table, laminated

Procedure

Warm-up

Have students choose a partner. Then have students tape one another's thumbs to their own hands with masking tape. Both partners should have their thumbs taped down. They will then work together to perform a variety of activities: pick up a penny, write their name, turn the pages of a book, tie shoe, etc. Have them then remove the tape and try the activities again, noting the difference when they have 'operable' opposable thumbs. Discuss 'natural selection' and how man's opposable thumbs are an example of an adaptation for survival.

Activity

Put one set of Adaptation Sheets from the Botany Bin on each of three tables. Divide students into three groups. Put a mix of plant specimens from each biome on each of the tables. Give each group a copy of the blank two-sided Table of Adaptations.

Explain to students that they will work together to determine which biome each plant is from and what the adaptation is that the plant has made to survive. They must justify the reason for each of their choices. They should use the set of Adaptation Sheets at each station to help them fill in the table accordingly.

Practice

Give students about 10 minutes at each table; have them rotate to all three tables, discussing and recording their observations. Encourage inquiry among students by using the information cards to guide their discussions.

Discussion

Have each group share one or two plants and their adaptations and how the adaptation will help each plant survive its biome. Project the answer key and have the students correct any errors or misconceptions on their tables. Expand on any of the adaptations that might need explanation such as a 'niche' in time, Cam-4 photosynthesis, etc.

Assessment

Listen to students' responses during the discussion; check the written Table of Adaptations with special attention to their reasoning.

Extensions

The website: www.ucmp.berkeley.edu has an excellent graphic explanation of **natural selection** if you would like to have your students explore the topic more thoroughly.

Use the lesson from www.ucmp.berkeley.edu/education/lessons/preying
Preying on Beans to demonstrate further the idea of **natural selection** and **adaptation.**