

Instructional Recipe

How Do Cacti's External Characteristics Help Them Survive in the Desert?

Second Grade, Science & Language Arts

Step 1 – Ask

Objectives: Students will compare various plants' characteristics. Students will analyze and explain how cacti's external characteristics help them to survive in the desert.

Introduction: Observe two different types of plants— one of which should be a cactus plant and the other should have leaves. Make observations about the external characteristics of each type of plant. Discuss ways in which the plants are alike and different.



"saguaro." Online Photograph. Encyclopædia Britannica Online School Edition. 10 Aug. 2008 <<http://school.eb.com/elementary/art-73109>>.

Ask:

- ★ What does the outside of a cactus look like?
- ★ What is it like in a desert?
- ★ How do the external characteristics of cacti help them survive in the desert?

Vocabulary:

- ★ desert
- ★ cacti
- ★ external characteristic
- ★ spines
- ★ waxy stem

Science TEKS:

(2.9) **Organisms and environments.** The student knows that living organisms have basic needs that must be met for them to survive within their environment. The student is expected to:

(A) identify the basic needs of plants and animals

(2.10) **Organisms and environments.**

The student knows that organisms resemble their parents and have structures and processes that help them survive within their environments. The student is expected to:

(B) observe, record, and compare how the physical characteristics of plants help them meet their basic needs such as stems carry water throughout the plant;

English/Language Arts TEKS:

(25) **Research/Gathering Sources.** (C) record basic information in simple visual formats (e.g., notes, charts, picture graphs, diagrams)

(27) **Research/Organizing and Presenting Ideas.** Students organize and present their ideas and information according to the purpose of the research and their audience. Students (with adult assistance) are expected to create a visual display or dramatization to convey the results of the research.

Technology Application TEKS:

(5) **Information acquisition.**

(A) Acquire information including text, audio, video, and graphics.

(7) **Solving Problems.**

(A) Use software programs with audio, video, and graphics to enhance learning experiences
 (B) Use appropriate software including the use of word processing and multimedia, to express ideas and solve problems.

Step 2 – Investigate

K-12 Databases Resources:

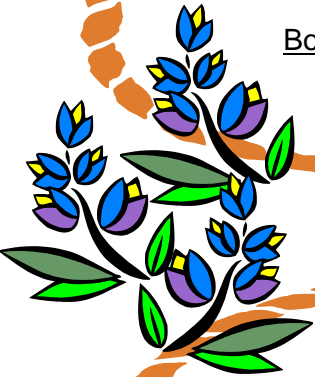
- ★ Searchasaurus-
 - [Plants of the Desert](#). Scholastic News -- Edition 2, Apr2008, Vol. 64 Issue 7, Special section p1-4, 4p; Reading Level (Lexile): 610; (AN 31293615)
 - [A Saguaro Cactus](#). Scholastic News -- Edition 2, Apr2006, Vol. 62 Issue 7, p2-3, 2p; Reading Level (Lexile): 520; (AN 20067267)
- ★ Search Encyclopaedia Britannica online using the keyword *cactus*. "**cactus**." *Britannica Elementary Encyclopedia*. 2008. Encyclopædia Britannica Online School Edition. 1 Aug. 2008
<<http://school.eb.com/elementary/article?articleId=352894>>.

Additional Websites:

Desert Plants- <http://www.mbgnet.net/sets/desert/index.htm>

Books:

Desert by Cassie Mayer
Desert Plants by Ernestine Giesecke



Step 3 – Create

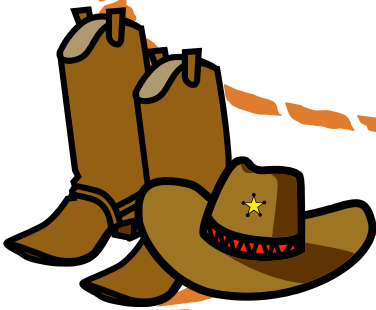
Students will take notes on saguaro cacti's external characteristics and how those characteristics help them survive in the desert. Students will draw a picture of the characteristic and write at least one sentence for each.

External Characteristics	How the Characteristic Helps the Cactus Plant Survive in the Desert

Step 4 – Discuss

Cactus Diagram- Students will create a diagram of a saguro cactus and label at least three external characteristics. Students will write one sentence about each characteristic explaining how it helps the cactus plant survive in the desert.

🔗 Technology Link – Students can use a drawing program, such as Kid Pix, to create their diagram.



Step 5 – Reflect

Allow students to present their projects to the rest of the class. Use the following suggested rubric to assess the students' work. Make sure that the students are familiar with the rubric *before* they begin creating their project. They should refer to the rubric repeatedly to monitor their progress in creating their project.

🔗 Technology Link: You can also create your own rubric with your students at <http://rubistar.4teachers.org/index.php>.

Rubric- Characteristics Chart

CATEGORY	4	3	2	1
Title	Title is informative, centered, and larger than other text.	Title is informative and larger than other text.	Title is informative and centered.	The title is incomplete and does not clearly indicate what is pictured.
Content	Sentences about three or more external characteristics are correct.	Most sentences about external characteristics are correct, or one sentence is missing.	Some sentences about external characteristics are correct, or one or more sentences are missing.	Student did not write sentences about external characteristics.
Labels	Every item that needs to be identified has a correct label. It is clear which label goes with which picture.	Almost all items (90%) that need to be identified have correct labels. It is clear which label goes with which picture.	Most items (75-89%) that need to be identified have correct labels. It is clear which label goes with which picture.	Less than 75% of the items that need to be identified have correct labels OR it is not clear which label goes with which item.

Sharing Cactus Diagram

CATEGORY	4	3	2	1
Speaks Clearly	Speaks clearly and distinctly all (100-95%) the time, and mispronounces no words.	Speaks clearly and distinctly all (100-95%) the time, but mispronounces one word.	Speaks clearly and distinctly most (94-85%) of the time. Mispronounces no more than one word.	Often mumbles or can not be understood OR mispronounces more than one word.
Volume	Volume is loud enough to be heard by all audience members throughout the presentation.	Volume is loud enough to be heard by all audience members at least 90% of the time.	Volume is loud enough to be heard by all audience members at least 80% of the time.	Volume often too soft to be heard by all audience members.
Posture and Eye Contact	Stands up straight, looks relaxed and confident. Establishes eye contact with everyone in the room during the presentation.	Stands up straight and establishes eye contact with everyone in the room during the presentation.	Sometimes stands up straight and establishes eye contact.	Slouches and/or does not look at people during the presentation.
Listens to Other Presentations	Listens intently. Does not make distracting noises or movements.	Listens intently but has one distracting noise or movement.	Sometimes does not appear to be listening but is not distracting.	Sometimes does not appear to be listening and has distracting noises or movements.