



GRADE 1



COAST ^{TO} CACTUS

IN SOUTHERN CALIFORNIA

Curriculum and Lesson Plan Resource Guide



theNAT
SAN DIEGO NATURAL HISTORY MUSEUM



Grade 1 Desert Plant Superhero Suit

Essential Question

What kinds of adaptations do desert plants have?

Desert plants have different adaptations that help them survive in their dry and hot environment. Desert plants have developed adaptations that include succulence, drought tolerance and drought avoidance. Each of these is a different but effective adaptation that helps these plants prosper under conditions that would kill most plants.



Activity: Superhero Suit Design

In this activity, students use their observation and research skills to study desert plant adaptations. Using research skills, students design a superhero suit inspired by desert plant adaptations.

Materials

- Printed plant information sheet
- Notebook or paper
- Drawing tools

This activity can be done by students working individually, following a visit to the *Coast to Cactus in Southern California* exhibition. (See Page 2 for activity instructions.)

Superhero Suit Design

Before the activity

- Review activity instructions.
- Print out plant information sheet.
- Schedule a field trip to theNAT. Reservations are required for all group visits. Please call 619.255.0349 to make your reservation or go online to www.sdnat.org/schoolprograms.

Background information

Some desert plants store water in fleshy leaves and stems. Several other adaptations are essential for water storage in the desert. A desert succulent must be able to absorb large quantities of water in short periods because desert rains are often light and brief. A cactus also has shallow roots to help collect rainwater before the soil dries rapidly under an intense sun. (Examples in the exhibition: California Barrel Cactus or Teddy-bear Cholla)

“Drought tolerance” refers to a plant’s ability to withstand an extreme lack of water without dying. Plants in this category often shed leaves during dry periods. Water that would be lost through the leaf surfaces is conserved for the plant stems. Some plants that do not normally shed their leaves have waxy coatings on their leaves that prevent water loss. (Example in the exhibition: Orcutt’s Aster)

Some plants escape the dry and hot conditions by maturing in a single season, then die after channeling all of their energy into producing seeds. Desert Chicory’s seeds lie dormant in the soil until the rains come. Then in just a few weeks, the plant sprouts, grows, blooms, reproduces, and dies—so it doesn’t have to endure the harsh desert summer.



During your Museum visit

Take time with your students in the desert section of *Coast to Cactus in Southern California* to focus on the desert plants in the exhibition.

What makes these plants different? Each of these plants is adapted to live in the desert habitat.

NGSS Alignment for Grade 1

Performance expectation: 1-LS3-1

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Constructing Explanations and Designing Solutions	LS3.B: Variation of Traits	Patterns

Interdisciplinary Common Core Connections: 1.RI.1, W.1.7, W.1.8, MP.2, MP.5, 1.MD.A.1

What is an adaptation? An adaptation is something a plant or animal has that makes it better able to live in a particular place or situation.

Back in the classroom

1. Pass out the plant sheets to the students.
2. Ask students to work on their own to use adaptations from plants to make a superhero suit. (Examples: A superabsorbent superhero suit or a superhero suit that makes you stronger every time it rains)
3. Have your students draw the superhero suits.
4. Students can make a presentation to teach their classmates about their specially designed superhero suit.

Extension

Have your students draw the desert environment for the plant that inspired their superhero suit.

What will they learn?

In this activity, students learn that desert plants have adaptations that allow them to survive in their environment. These adaptations help them survive hot and dry weather in the desert. Some of these adaptations include water conservation and storage, drought tolerance, and drought avoidance.

Additional Resources

- Check out a specimen from our Nature to You Loan Library. For more information visit sdnat.org/specimenssearch or contact the Loan Library at loanprogram@sdnhm.org or 619.255.0236.
- Use the *Explore the Region from Coast to Cactus* website to learn more about the different habitats in the southern California region. Visit coasttocactus.sdnhm.org to journey through coastal areas, mountains, and deserts, and to learn more about San Diego's amazing diversity of plant and animal life.

Key words

Environment

The conditions that surround someone or something; the natural world.

Plant

A living thing that grows in the ground, usually has leaves or flowers, and needs sun and water to survive.

Habitat

A place where a plant or animal lives or grows.

Survive

To remain alive; to continue to live.

Desert

An area of very dry land that is usually very hot and receives little rain.

Adaptation

Something a plant or animal has that makes it better able to live in a particular place.

Desert Plants



Orcutt's Aster
Xylorhiza orcuttii

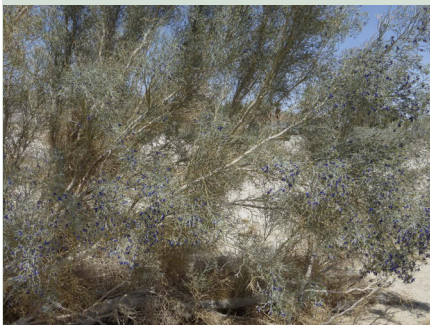
Orcutt's Aster leaves have a waxy layer that acts like a sealant, holding in precious moisture.



Barrel Cactus
Ferocactus cylindraceus

Teddy-bear Cholla
Cylindropuntia bigelovii

A cactus can store enough water in its core stem to survive years of drought. Shallow roots collect rainwater before it evaporates. Needle-like spines offer shade, reflect light, and hold moisture near the plant's surface.



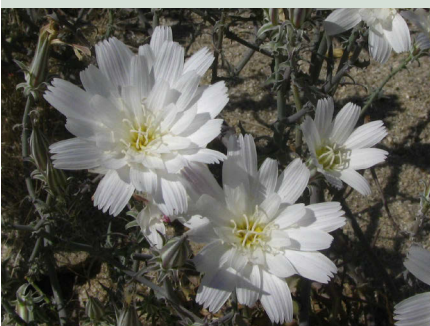
Smoke Tree
Psoralea argophylla

A Smoke Tree has long roots that tap into water sources deep underground, so it doesn't have to absorb rainwater before it evaporates.



Desert Agave
Agave deserti var. *deserti*

Desert Agave conserves energy by reproducing just once in its long lifetime. When it is between 20 and 40 years old, the plant sends up one giant stalk topped with flowers. Pollinators visit, and then the plant dies—leaving its seeds to sprout a new generation.



Desert Chicory
Rafinesquia neomexicana

Desert Chicory's seeds lie dormant in the soil until the rains come. Then in just a few weeks, the plant sprouts, grows, blooms, reproduces, and dies—so it doesn't have to endure the harsh desert summer.