



# MOJAVE SCAVENGER HUNT

## Activity Guide

### Objectives

- understand how a plant's structure can reflect adaptations to its environment
- be introduced to the structure and function of leaves
- observe and begin to recognize at least 4 different Mojave Desert plants

### Materials

#### For the lesson

- Mojave Scavenger Slides (provided)
- Mojave Scavenger Hunt Worksheet (provided)
- Access to a diverse desert garden

#### Optional

- for each participant one small bag including a small candle, a piece of sand paper, small sponge, and small parasol

### Summary of Activities

**Background.** Desert plants have developed adaptation in response to many conditions including drought. Water is often limited in a desert environment: some desert plants have either very deep or shallow extensive root systems; large root systems help the plant access scarce moisture. Alternatively, desert plants can have a very deep tap root: some creosote bushes grow roots from 50-100 feet deep. If a plant has a large root (the water-absorbing surface) relative to its top (the evaporative surfaces from which water is lost), it is well-suited to a dry environment.

**The following information is presented so you can follow along with the images and information that is provided on the slides.**

**Slide 1-3.** Begin by asking: Who in here has ever been really thirsty? What did that feel like? Allow some time for the kids to answer. Introduce the word Adaptation. Adaptations are special features that allow a plant or animal to live in a particular place or habitat. These adaptations might make it very difficult for the plant to survive in a different place. This explains why certain plants are found in one area, but not in another. For example, you wouldn't see a cactus living in the Arctic. Nor would you see lots of really tall trees living in grasslands (mbgnet.net).

**Slide 4.** Introduce the activity by explaining what a scavenger hunt is (they will look for specific items outside).



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### *Summary of Activities (cont'd)*

**Slide 5-6.** Provide them with the following items (if available). Allow them to observe and feel the items. Ask them, what is the purpose of this item? What does it do? What does it feel like? Give them time to respond.

**Slide 7-8.** Explain that they will be participating in a scavenger hunt. Their task is to find plants in a native plant garden with leaf adaptations represented by the objects. Once finished, use the powerpoint, go over the below adaptations. Go over why plants may adapt by examining the items in the scavenger bags.

**Slide 9. Drought resisters** (sponge, water)—plant can swell up. Examples: Barrel cactus and Beavertail cactus. Ask students, have you seen an accordion work? When you expand it, air comes in and when you push it in, the air comes all out. Some desert plants can bulge up like a in the same way with water, but can also shrink if there is a lack of water. When it rains in the desert, these plants can increase as much as 50 percent through water absorption. In drought period, these desert sponges gradually shrink as they use their internal water to help them survive..

**Slide 10. Heat Reflectors:** (felt/fabric) Examples: Cholla Cactus, Brittlebush, and Phacilia. The light-colored spines, hairs, or leaves are used to reflect heat so that the plant can stop moisture from evaporating. Ask the students what happens to their skin if they are in the sun all day. Do they get sunburned? When we go swimming or hiking, we put sunblock on our skin to protect us from the sun's rays. Sunscreen is the color white because that color helps reflect sunlight. Plants don't have sunblock like us, but some do have light-colored spines, fine hairs, and light colored leaves to help reflect sunlight. Reflecting sunlight helps these plants retain moisture they need in our dry desert.

**Slide 11. Shade providers** (Parasols) Examples : Cholla Cactus, Mojave Yucca, and Joshua Tree. The finely divided leaves/spines reduce the surface area of the plant, which stops evaporation. Ask students what they might use to shade themselves if they were walking on a sunny day. Maybe they wore a hat or used an umbrella. Just like those objects that block out the sun, certain plants use their spines and leaves to create pockets of shade. For example, if you look at a cholla cactus, it has spines arranged in a particular way to shade it from the sun's intense rays. Joshua trees have adapted by purposely shedding leaves so that they lie against the tree trunk to perform the same function.



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### *Summary of Activities (cont'd)*

**Slide 12. Waxy coating** (candle) Examples : Mojave Yucca, Creosote, and Beavertail Cactus. The waxy surface on the leaves of these plants help stop evaporation so the plant can retain water. Ask students what happens when they run or exercise. Do they sweat? Ask where the sweat comes out of. Relate this back to plants. Like humans, plants also “sweat.” Plants have tiny openings similar to pores that are called stomata. The sun causes water to evaporate, or transpire, through the plant’s stomata. Tell them if we were to exercise with petroleum jelly on our skin, it would make it harder for our sweat to be released. The petroleum jelly blocks your pores and the water cannot escape. This is exactly what the waxy coat does to plant’s leaves and pads. If the plants have this waxy coat, it doesn’t let water escape as easily, thus reducing the plant’s water loss.

**Slide 13.** Time to review! Ask students the following: Describe three examples of how plant structures are modified with low water availability and high temperatures. How do desert plants survive drought, high temperatures, and intense sunlight?

**Slide 14.** Make a prediction! Given the specific adaptations of desert plants have developed in response to low water availability, what kinds of adaptations would you predict plants might develop in response to excess water availability?



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