



High Touch High Tech®

Science Experiences That Come To You™

Cactus Survival©

In the dry, seemingly lifeless desert, there is one tall, flourishing green plant... The cactus! How does this plant thrive in an environment where it rains less than 10 inches of rain a year? Let's find out!

Supplies:

- 5" x 8" green construction paper (or white paper colored green)
- 4 x 1" strips of sandpaper
- Glue stick
- Scotch Tape
- Bowl of water

Instructions:

1. Fold your paper back and forth like an accordion, creating ½ inch pleats.
2. Tape one side to the next creating a tube-like shape.
3. Take the strips of sandpaper and glue them to the vertical ribs of your cactus. These represent your spikes!
4. Stick it in a small bowl or cup of water. Watch it absorb the water and see the ribs expand just like how a real cactus would plump up!

This amazing adaptation is what ensures the cacti's survival and makes it the most recognizable desert creature.

The Science Behind It:

How would you describe the word, "extreme"? What would be an "extreme" temperature? Super-HOT, Freezing COLD, Super Dark!

Can you name an environment on Earth that is extreme? The north pole! Antarctica! The desert! Sahara Desert! What about the bottom of the ocean?

Ever wonder how plants and animals survive in scorching 100-degree heat of the desert? How emperor penguins cling to life in 100 mile an hour winds along with below freezing temperatures? Have you ever dreamed that in the darkest depths of the oceans -alien looking creatures thrive in boiling hot water and endure extreme pressure?

Let's explore some of the earth's extreme environments and learn how some of those amazing animals that live there have adapted to their environment! But what does adaptation mean?

Adaptation: A change in structure, function, or behavior that helps an organism improve its chance of survival in a specific environment. Adaptations develop as the result of natural selection operating on random genetic variations that are capable of being passed from one generation to the next.



High Touch High Tech®

Science Experiences That Come To You™

White fur to blend into a snowy environment, body parts that glow in the dark to help catch prey, migration or hibernation to avoid extreme seasons, the ability to store water or fat in their bodies are all examples of adaptations.

Let's talk about the **desert**. A desert is a large, dry region with usually sandy or rocky soil. Water evaporates rapidly and most deserts average less than 10 inches of rain per year.

Death Valley in California is the driest desert in the USA with about 2.3 inches of rain/year. A temperature of around 120 degrees Fahrenheit is common in the summer there. The driest hot desert on Earth is the **Atacama Desert in Chile**, which gets less than 1 millimeter of rain! That is about 0.04 inches!!! About 50X drier than Death Valley.

Although the desert is often thought of as lifeless and barren and lack of water is its biggest problem, it can be home to a wide variety of blooming plants and exotic animals. Can you name an animal or plant that lives in a desert? Cactus! Snakes! Those rabbits with the big ears! Scorpions! Camels!

Desert Adaptation Examples:

- **Nocturnal:** many animals only come out at night when it is cooler
- **Water storage:** Cacti stores water in its flesh and the kangaroo rat stores water in an internal canteen! Camels store fat in their humps that can be converted to water and energy when needed.
- **Big ears for heat dissipation:** Help animals stay cool
- **Eat your water:** Eating cactus and other creatures to absorb water

The **saguaro** (Pronounced sa-WA-row) is the most famous cactus in the Sonoran Desert, which is in the southwestern part of North America. The saguaro can grow to over 50 feet tall and can live up to 175 years! Remember that all cacti "bodies" are good at storing water when the desert is going through a drought.

The saguaros heavy trunks, thick arms, and vertical woody ribs all help them store plenty of water. Between each rib is a pleat that will swell with water when it does rain. Like an accordion. A saguaro can absorb up to 95% of its total weight in water.

The outer waxy cuticle protects the plant from sunburn and slows evaporation of water. The sharp spikes on the saguaro discourage grazing animals from nibbling on the moist tissue.



High Touch High Tech®

Science Experiences That Come To You™

Saguaro Cactus Images

