Natural History Museum of Utah Partnering with the Utah State University Extension

Utah Explorer Desert Naturalist





Become a Utah Explorer Naturalist

Welcome to the Utah Explorer Naturalist Program!

You can work on this program anywhere in Utah. Many of the activities also can be used if you live outside of Utah. Although it is encouraged that you visit some of the areas we refer to in this booklet, we know this is not always possible. Therefore, we have included plenty of multimedia resources and hands-on activities to help enhance your understanding of Utah Deserts. All activities can be done at your pace. There is no deadline for completing the program. This program is designed for the approximate ages 8-11. This program may also be used by younger or older students as is appropriate.

When you have completed all the requirements to become a Utah Desert Explorer Naturalist, email a photograph of your completed scorecard to **vallyse@nhmu.utah.edu**. Make sure you include a mailing address. You will receive your patch and certificate in the mail.*

*An electronic version of the certificate is available now, but there may be a delay of a few months before the physical certificates and patches are available.

Role of Adults

- Supervise student activities and ensure safety at all times.
- Help student read and understand Explorer Naturalist Activities, and if necessary, help them complete activities.
- Review completed activities and initial scorecard.
- Help students explore Utah deserts through field trips or further use of other media sources.

To earn your patch and certificate, complete and initial all activities on scorecard, photograph the completed scorecard, and email it to NHMU.

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Name:		
Email:		
ddress (does not have to be a home address	s):	
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Activity	Student Initials	Adult Initials
Activity Desert Naturalist Pledge Page 3		
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Desert Naturalist Pledge Page 3		
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Be sure to include your name, and an address where we can send the certificate and patch.

You must have an adult's permission to send us your real name and address. Including your last name is optional. You may use the address of a school or another place that is not your home. If you do, include the name of a teacher or adult who can get the certificate to you.

Questions? Please contact us by Email: vallyse@nhmu.utah.edu or Phone: 801-581-6418

Activities

Our Utah deserts are an important ecosystem for the plants and animals that inhabit them. They are also a vital resource for humans. It's important to learn as much about Utah deserts as we can so that we can help them remain healthy, restore them to better health, and use them wisely.

As a Desert Naturalist I pledge that ...

- ► I will care for the desert by remaining on established trails and paths.
- ► I will clean up after myself, and practice "Leave No Trace" principles. If I decide to pick up trash left by others, I will ask an adult first if it is safe for me to do so.
- I will care for, and respect, animals in the desert. I will keep my distance from them, and not feed them.
- ► I will care for desert plants. I will take pictures instead of pulling off flowers, branches, or leaves.
- ▶ I will talk to my friends and family about the importance and beauty of the Utah deserts, and encourage them to become desert protectors also.

Signature of Desert Naturalist

As a Desert Naturalist, you will be observing and learning about:















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When you think of a desert, what do you imagine? Do you think of someplace that is full of sand where nothing or very little grows? Do you think of it as a hot, dry place where there isn't any source of water? What about desert plants and animals? Do you imagine lands inhabited by camels and cacti? These things can be true, but did you know that deserts can also be cold? Rivers can run through deserts. Snow falls in some deserts, and deserts can be home to a variety of animals and plants.

To be called a "desert", an area has to have a low rate of precipitation (rainfall or snow), and a high rate of evaporation (water that dries up). This means that most years all the water that falls in the desert completely disappears into the atmosphere through evaporation. Most deserts have less than 25 centimeters, or ten inches of precipitation in a year.

There are actually four types of deserts:

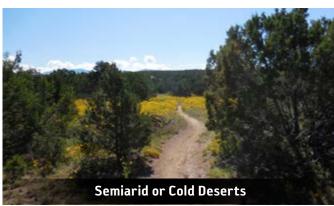
Hot and Dry Deserts are just like you imagine. Very hot and very dry, for most of the year. Nights can be chilly, however, as there is little moisture in the air to hold the daytime heat near the earth once the sun goes away.

Semiarid or Cold Deserts describes most of the deserts in Utah. These deserts have periods where it's hot and dry followed by periods where they cool down and receive more moisture in the form of rain and snow. You may see more types of plants in these deserts.

Coastal Deserts are near very large bodies of water, like the ocean.

Polar Deserts are in the very far north or very far south of the planet. They often get much of their precipitation in the winter and spring.



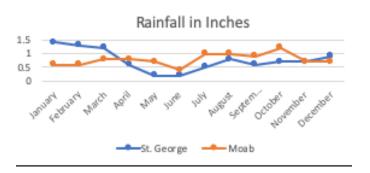






Wherever You Are

This is a graph of the rainfall in two cities in Utah: St. George, which is located in the **Hot Dry Mojave Desert**, and Moab, which is in the **Semiarid Colorado Plateau**. Study the graph carefully.



Which city has a wider variation in rainfall over the months of the year?

2. Do you think you live in a desert environment? What evidence supports your answer? If you think so, what kind of desert do you think it is?

Outside

This can be done where you live, go to school, or on

an actual field trip. Go outside and look around.

1. Describe the environment around you. Do you see

one of the deserts on the previous page?

anything that looks like something you could see in

Answer the following questions:

Which city has a more even amount of rainfall over the course of the year? Why do you think this city is considered more "semiarid"?

If you had to pick one of these cities to live in, based on rainfall alone, which would you choose and why?

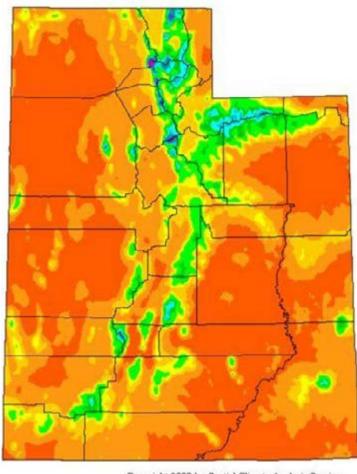
Online

"What is a Desert?"
youtube.com/watch?v=RZLpE7jJ

As a state, Utah is very dry. It is the second driest state in the United States. What does this mean? It means that compared to other states, Utah receives much less water in the form of rain or snow than most of the rest of the country.

Utah gets less than an average of 13 inches of water per year. This might seem like a lot, however most of that water falls in the mountains. Look at the purple, blue, and green areas on the map below. That is where more than 25 inches of water falls per year. What patterns do you see in this map? Where do you think the mountains are?

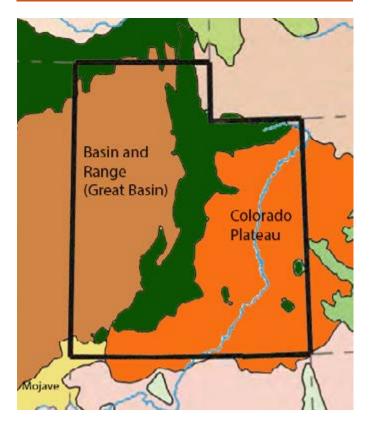
The areas that are darker orange get under ten inches of rain. As you can see in this map, there is a lot of orange in Utah. These are the Utah deserts areas.



Contrible 2000 by Spatial Climate Analysis Service



Wherever You Are



Utah deserts are divided into three areas: the Basin and Range Desert, the Colorado Plateau Desert, and the Mojave Desert. Which desert do you live in, or are closest to? It does NOT have to be in Utah if you are from a different state/country.

The Mojave Desert is Utah's only Hot/Dry desert. What type of deserts do you think the Great Basin and the Colorado Plateau are? What helped you decide?

Outside

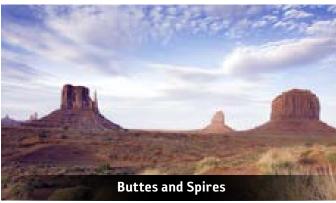
1. What kind of plants do you see? Do you notice any similarities between the plants? Do you see any patterns on the plants?

2. Draw a picture of what you see outside. Add labels. If you don't know exact names of things, just write whether it is a plant, insect, animal, etc.

Online

Dust Devil Mojave youtube.com watch?time_continue=22&v=6lueKZkfqlU

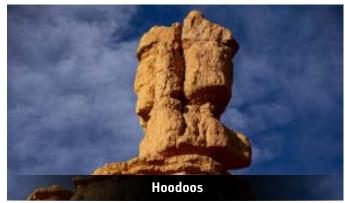
Colorado Plateau and The Great Basin youtube.com/watch?v=ujJ-One3qiE



Monument Valley



Great Salt Lake Salt Flats



Bryce Canyon



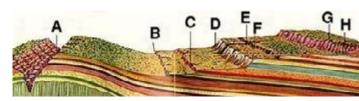
Arches National Park

Have you seen any of these geologic formations?

Utah Deserts contain some spectacular features, formed by the natural processes of mountains being built through faults (cracks in the Earth's crust caused by movement of the Earth's crust), volcanoes, and folding and stretching of the continental crust. Utah was also part of an ocean, an inland sea, and later, a giant freshwater lake. This is why Utah has layered rock (sedimentary), and the underground salt domes.

Wind and rain and other processes are wearing away the land in Utah, and because Utah doesn't have a lot of trees and plants covering the surface of the land, it is easy to see the effects of this erosion.

Scientists from all over the world come to Utah to study its geologic features. One feature they study is "The Grand Staircase" in Southern Utah/ Northern Arizona. This is a huge sequence of rock layers in the Colorado Plateau where the youngest rocks are found at Bryce Canyon and then step down until the oldest rocks are found in the bottom of the Grand Canyon. The Grand Staircase holds an incredible fossil record that teaches scientists about life on earth.



Grand Canyon (A), Chocolate Cliffs (B), Vermilion Cliffs (C), White Cliffs (D), Zion Canyon (E), Gray Cliffs (F), Pink Cliffs (G), Bryce Canyon (H)

Wherever You Are



Many geologic formations are versions of the same thing. Here is a plateau. It is a large area of land, with a flattened top, raised above surrounding land. The top of the plateau is formed of rock that is resistant to erosion. These pictures show what a plateau will look like as land is eroded away.







What details can you see in the above pictures that are similar? What details do you see that are different? From what you know about erosion, what do you think causes the changes in the landforms over time?

Outside

Go outside. Look around for a geologic formation. It can be something big, like a mountain, or even just a little gully in the playground. **Draw a picture of what you see.** What do you think created that formation? Was it water, wind, a volcano, folding, or something else?

Online

Hoodoos of Bryce youtube.com/watch?v=pf-Pv_EToRk

Bonneville Salt Flats
youtube.com/watch?v=RglUWJoNMBI











We already know that deserts aren't only sand and rock. Here are several types of Utah desert communities.

Biological Soil Crust: This is a desert community that many people don't know about even though it is perhaps the most important. In the soil, communities of living organisms form a structure that helps make the soil surface resistant to wind and water erosion. Biological Soil Crusts also store water, nutrients, and organic matter and make them available for plants. Unfortunately, as important as they are, they're easily damaged by being walked on, and they can take a long time, sometimes decades, to fully recover. So please stay on trails and avoid walking on the crust!

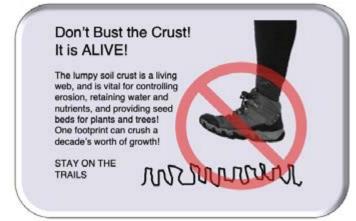
Sand Dunes: Even though you might not think much grows in sand dunes, they actually are home to a lot of plants and animals. In fact, some Utah sand dunes are the home to plants and animals not found anywhere else in the world.

Grasslands: These communities are made up of many types of grasses, wildflowers, plants like yucca and rabbitbrush, and sagebrush. The grasses in the Utah grasslands are mostly short grasses, but they still support a wide variety of life. You might also find songbirds, mice, prairie dogs, ground birds like pheasants, pronghorn, and even bison.

Salt, Cool, and Warm Deserts Shrublands: There are several types of shrublands in the Utah deserts, and what grows in each depends on the yearly temperatures, the elevation, the soil, and the amount of water. One thing that shrublands have in common is that they tend to have smaller plants and trees, with living organisms that have special adaptations to deal with times of little water, and temperature fluctuations.

Pinyon-Juniper Woodlands: This community occurs at higher desert elevations. The trees, mostly Utah Juniper and Pinyon Pine, tend to be shorter than those in other woodlands, usually less than 6 meters (about 19.5 feet) tall. These trees are also extremely slow growing and can be some of the oldest trees in the world.

Wherever You Are



Have you heard the saying, "Don't Bust the Crust"?

More and more, people are learning about the importance of biological soil crusts (also known as cryptobiotic soil and microbiotic soil). They are vital in maintaining soil, plant, and animal life in desert and semi-arid regions of the earth. Come up with three ways you would encourage people to care about, and take care of, biological soil crusts.

1.	
2.	
3.	

Outside

Materials: small dish (one that can be washed or thrown away), soil, a light-colored piece of paper. Go outside and scoop some soil in a small dish. If you are in a desert, and you get a chance to look at biological soil crust, please don't gather any. Just look at it from the trail. Find a place that you can place the light-colored paper down, and sprinkle the soil on it. Look at the soil closely. What do you see? **Draw a picture and label anything you recognize.** Remember to wash your hands afterwards.

Online

Desert Scrubland

untamedscience.com/biology/biomes/desert-scrub-biome/

Biological Soil Crust (This quiz is just for fun. Get adult help if needed.)

nps.gov/arch/learn/kidsyouth/biologicalsoilcrust.htm

Recognize Desert Plants

Activities







In order to survive in a harsh environment, plants have to have special adaptations. Here are some of the things you will find in desert plants:

Water Storage: Perhaps you have heard the word "succulent" before. This means a plant that has thick, fleshy leaves, stems, or roots that can hold water. Many desert plants are succulents. Notice how much liquid is stored in this succulent.

Shallow Root Systems: Many desert plants have fibrous roots systems that are very shallow and spread out a long way. When it does rain, they can capture the water that falls very quickly, and spread it to parts of the plant where it is needed.

Waxy Coating: One way that desert plants can conserve water is to have a waxy coating on their leaves. The coating protects the plant from the drying effect of sun and wind. The waxy coating also is shiny, and this reflects the sunshine, helping to keep the plant cooler. Sometimes the waxy coating tastes or smells badly to animals, keeping them from eating the plant.

Drought/Winter Dormancy: This is when a plant is alive, but is no longer growing. A lot of desert plants will go into dormancy when there has been a long period without sufficient water, or during the colder months.

Long Taproots: A taproot is a long, central root that other roots grow from. Not all plants have taproots, but desert plants that do have taproots often have very long ones. This makes sure that they reach down deeply where the soil is moist or there is a water source. Some taproots have even been found to be hundreds of feet deep!

Wherever You Are

You are the designer of a desert plant. **Draw your plant below.** What features did you give it to help it survive the harsh desert environment? Make up some features if you wish! Name your plant and write about the desert adaptations you gave the plant next to the picture.

What is the name of your plant?

What desert adaptations did you give your plant?

Outside

Go outside and find a plant. Be careful about touching plants that you don't know. What do you notice about the plant? Is it large or small? You can use the ruler on the back of this book to get some measurements. If it has leaves, are the leaves smooth or do they have fine hairs on them? Are they glossy or dull? How large is the plant? What colors do you see in the plant? What else do you notice? Would any of these features be useful in the desert? Do you see any patterns or symmetry?

Online

Utah Desert Plants

wildaboututah.org/amazing-adaptations-of-utahsdesert-plants/







Animals also have to adapt to the conditions they live in, and desert animals have some very amazing adaptations. Some animals have special body types that help them in the desert. Compare these pictures of a cottontail rabbit and a kit fox. What do they have in common?

Did you say their long ears? How about their coloring? Also, kit foxes are the smallest of all wild canids (dog-like) mammals in North America. They are only about half the size of an average house cat. So being small is another thing that they have in common.

Many animals have physical adaptations like coloring, size, and specialized body parts that help them survive in the desert. The long ears of the cottontail, jack rabbit, and kit fox help cool the animal. Their coloring often helps them hide from predators.

Some animals have behaviors that help them survive hot, dry days, or even colder winters. Notice that the rabbit above is resting in the shade. Staying in the cool shade is one behavior animals use to stay cool. Other animals only come out at night or during the early morning and evening when it is cooler.

Some animals, like the desert tortoise, will burrow down into the ground during the hot times of year to keep cooler. Tortoises also brumate (similar to hibernation) in their burrows during the cold times of year. Finally, one of the most amazing adaptations that a desert tortoise has is an extra large bladder; it can store almost half its weight in water in its body, and has the ability, when it is dry, to get rid of waste from its body without losing a lot of water. There are many other animals that have adapted to the scarcity of water in their environment.

Wherever You Are



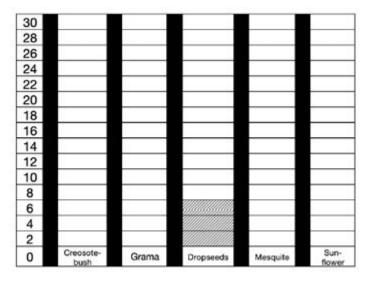
National Park Service

This is the Ord's kangaroo rat, one of several types of kangaroo rats that live in Utah. In Utah they tend to live in the sagebrush and pinyon-juniper forests. The Ord's kangaroo rat has some amazing desert adaptations:

- ► It doesn't have to drink. It can get all the water it needs through eating seeds.
- ► They come out at night when the summer temperatures are cooler.
- ► Their fur is dull and colored to blend in with desert plants and soil.
- ► It can fill its cheeks with hundreds of seeds to carry at one time.

Outside

Go outside, and, no matter what time of year it is, pretend that you have just walked outside on a hot, desert day. Look around. What could you use in your environment to protect or cool yourself from the heat? Is it plants, a building, the earth, or maybe it would be something you wear, or a behavior you would do?



Story Problem: An Ord's Kangaroo rat cache was found in the Texas desert. In the cache, the rat had stored 28 creosotebush seeds, 12 seeds of grama grass, 6 dropseeds, 18 mesquite seeds, and the 8 sunflower seeds. **Color in the bars that show the number of seeds found.** One has been done.

Give two possible reasons that you think there were more creosote bush seeds found.

Online

Kit Foxes wildaboututah.org/tag/kit-fox/

Ord's Kangaroo Rat
youtube.com/watch?v=wkJLHnYy_G0

Desert Sidewinder youtube.com/watch?v=EIdyy6hhWh0

Investigate Human History in the Desert

Activities







People have been passing through and using the land and resources of the area that is now Utah for at least 12,000 years. The earliest people, who are called Paleoindians, were mostly nomadic, moving around to hunt, fish, and gather plants. There is evidence of these early people found in caves in the Great Salt Lake Desert areas.

Later, as the climate warmed, people continued their hunting and gathering lifestyles, and began to develop new ways of living and survival in the deserts. The Fremont and the Ancestral Puebloans were two groups that hunted, built villages and farmed the land. Although the two cultures occupied what would one day become Utah at roughly the same time, the Fremont were mostly in the north and the Ancestral Puebloans occupied the southern part of Utah.

The *indigenous* people that now live in Utah likely arrived a thousand years ago. The Utes, Paiutes, Goshutes, Shoshone, and Navajo people, were here before any European settlers. Today many Utahans have native heritage, and thousands belong to the tribes that call the Utah deserts home.

The artwork and the dwellings of ancient and modern native peoples attracts tourists to Utah from around the world. Have you had a chance to experience any places that are important to Utah natives?

Wherever You Are

The land that is now Utah has been occupied for over ten thousand years. In that time, the climate changed. Life would have been hard in the Utah deserts as things got warmer and drier. If you lived in Utah in the ancient past, what would you have looked for in a home? Draw a picture in the rectangle and write about what you would have done to survive the Utah deserts.

If I lived in the desert, I would want these things to be in or near my home:

	_
	_

Outside

You will be selecting a "sit spot"; a quiet place where you can sit and make observations. Choose a spot carefully. Make sure you are dressed properly, and watch out for any hazards. When you are settled, it is time to look around and think about the people who were in that exact place hundreds of years before you. (This activity can be done looking out a window.)

► What do you think they saw? Was it what you are seeing now? What would they see that you see also, and what would be different?

▶ What do you think they heard?

► What do you think they ate? Where did it come from? Could they get it close to where you are now, or would they have had to travel?

Online

Tribes of Utah youtube.com/watch?v=-u-GPanlfaE

Fremont State Park
youtube.com/watch?v=ucymk0n08Qs

Ancestral Puebloans
youtube.com/watch?v=eauhxTxPhIE

Humans in the Desert Today



Today the Utah desert remains important to humans. There are lots of things that people do in the deserts, and lots of resources that we need and use.

Living: Many people continue to live in the Utah Deserts. Some desert towns are Moab, St. George, Escalante, and Torrey. Many of the lands and sacred places of native tribes are also in the Utah desert.

Recreation: There are a lot of ways to have fun in the Utah Desert. People enjoy hiking, canyoneering, camping, backpacking, off-roading, bird and animal watching, river rafting, and even fishing in the deserts.

Mining: Mining has occurred in every county in Utah at some point in history, and still occurs. Today there are thousands of mines in Utah deserts.

Oil and Gas: Oil and natural gas can be found in the desert, but Utah isn't a major source of either for the country. Oil and gas producing wells are centered in the eastern part of the state, in the Colorado Plateau area.

Water management: Utah deserts are filled with human-made reservoirs, developed for the purpose of retaining and controlling the flow of water. Humans also use the reservoirs as major recreation areas in the Utah desert.

Wildlife watching and hunting: Even in the desert, there is a wide variety of wildlife. Some of the animal species are managed through hunting.

Ranching: Even though it seems like a desert would be an unlikely place to raise animals, since the late 1800s, sheep and cattle have been grazed in the Utah desert.

Tourism: Five national parks and numerous state parks exist in the deserts of Utah. These are sites of natural beauty, human antiquities, and religious significance. Millions of people come to enjoy the Utah deserts each year.



Wherever You Are

Look for the following items around you or online.

Put an answer in the box for each item you find or know. Keep going until all of the boxes are filled out. Asking for help or using the internet to answer is okay!

A small animal	A type of rock that	Two types of
that can be found in	might be found in	geologic formations
the Utah desert	the Utah desert	found in
	_	the Utah desert
Someone who	A plant that	Someone who has
has been to Zion	might live in	played in the
National Park	the Utah desert	Utah desert sand
Something that can	A large animal	Someone who has
be made from copper, a mineral mined in	that can be found in the Utah desert	been hiking in the Colorado Plateau
the Utah desert	the otali desert	semiarid Utah desert
Something that	The name of one	Someone who has
Utah ranchers	or more tribes that	been to Arches
might raise	continue to live in	National Park
	the Utah desert	in Utah
Something made	The name of	Something that
from materials	a city or town in	natural gas, found
found in	the Utah desert	in the Utah desert,
the Utah desert		is used for

Online

Adventures for all rei.com/blog/hike/adventure-for-all

Kids hike to Delicate Arch youtube.com/watch?v=Doj6crV1g3o

Outside

Go on a hike. It can be a hike in the desert, a walk around the neighborhood, or a walk around the backyard or playground. The "hike" should take at least 15 minutes.

On the hike you should take:

- ► An adult experienced with hiking. Remember it is important to be safe at all times. Know how to avoid snakes.
- ▶ Water and a snack if necessary.
- ▶ Protection from the weather, depending on what the weather is like.
- ▶ Sturdy shoes and a walking stick if needed.

Describe your hike:			

Historic Desert Naturalist

Activities

Alice Eastwood



Photo by Clements, Denver, CO 1887

Very early on a morning in April 1906,
Alice Eastwood was awakened by something.
She soon realized that her bed was swaying,
and she knew then what it was: an earthquake!
Getting up, she quickly grabbed the robe
that had been draped across her bedroom
chair, and moved to stand in the frame of the
doorway, as she had been taught.

After the shaking had stopped, and Alice was certain nothing in her home had been damaged, she got dressed and went to have some breakfast before going to work. The sky had lightened, and when she stepped outside, she could see smoke drifting up from the direction of the Academy, where she worked and kept her plant collections. The plants were from all over the United States, including many from western deserts.

Looking around, she saw that her San Francisco neighborhood was spared serious damage, but she feared that other parts of the city were not. She hurried her mile walk down the hill towards Market Street, and found she was right.

Each block, each step, showed more ruin. Everywhere people were exiting buildings, gathering items, and dragging what they could away from the unsafe houses.

When she reached the Emporium, the department store next to her work, she saw workers bringing out goods, carrying them away. Although there were people on the street, it was strangely and eerily quiet. The Academy itself was damaged but standing, and she carefully went up the stairs to try the door. It was locked. As she came back down the stairs, she saw Robert Porter, her friend from the Sierra Club, coming down the street, and she rushed towards him.

"Alice," he greeted her, his face serious. "The building is standing," he nodded towards the Academy, "but the fire is nearby. If it isn't stopped, this is going to burn."

"I have to get in there, Robert. I have to get to the plant specimens." They walked around the building, and could find no way in, but coming back around, they found that Academy director, Leverette Loomis, and caretaker, John Carlson, had shown up with keys. They managed to get into the building through a damaged entry. Inside, the staircase heading up to the sixth floor, where the plants were kept, was broken. Still, she and Robert, by holding onto the railings attached to the walls, precariously climbed up the stairs and found the specimens. Together they tied them up and lowered them down to the ground floor with ropes and strings. By the time they got done, the fire had reached the building next door, and they had to leave. They risked their lives, but in doing so had managed to save over a thousand irreplaceable specimens. Alice also managed to save one more thing that was precious to her: her hand lens. She slipped it into her pocket, and then headed back down the stairs to find someone with a wagon who could take her plants somewhere safe.

Alice lost her books and records that she kept at the Academy. The fire then spread to her neighborhood and she lost her home and her belongings. She later said of that day, "I do not feel the loss to be mine, but it is a loss to the scientific world... My own destroyed work I do not lament for it was a joy to me when I did it, and I can still have the same joy in starting it again." (Wilson, 1955, p. 96)

Wherever You Are

Historical figures are people in the past who did something that is memorable, and made them famous in some way. Do you know of any historical figures that did something good for people, animals, or the environment? Who was it? What did they do? (If you are not sure of any, you can look up one of these people: Frances Hamerstrom, Enos Mills, Maria Sibylla Merian.) Make a poster, write a short story, or create a website profile about this person. You can do this on a separate piece of paper.

Outside

You are going to go outside and pretend you are an early naturalist. You will be keeping a Naturalist Diary, much like Alice Eastwood would have. **Make notes in the space below about something you find that you want to know more about.**

Online

Eight Naturalists

blog.theclymb.com/out-there/8-naturalists-changedoutdoor-history/

Activities

What does it mean to become a desert naturalist?

What else can you do?

- ► **Study.** Read and watch everything you can about the Utah desert, and the people who live in it and have lived there in the past.
- Visit. Any chance you get, go to the desert, even if it is not very far from your home. When you visit, spend a lot of time just observing. Write about what you observe, what do you see, what do you smell, what colors do you see, watch the weather, look closely at plants and soils. If you can't visit, watch videos about the places you can't travel to.
- ► Talk to people. Find experts who know about the Utah deserts, the animals, the plants, the soils, and if you can, talk to them about what they know.
- Learn to identify desert plants and animals.
- ► Learn about tracking desert animals, about their footprints and other signs that they leave. Again, you can find books and information online to learn this.

A naturalist is someone who works to understand not only the animals and plants in an environment, but also how each one relies on the other.

A naturalist works to understand as much as possible about the area.

You can go to school to become a naturalist, but you can also become an amateur naturalist in your everyday life. Alice Eastwood never managed to attend college, but she let her love of plants and nature guide her learning, and she became an expert in her field and a fierce protector of the natural world.

Another part of becoming a naturalist is helping others understand things that you have learned about the natural world. It is important to do this in a way that doesn't scare or make people feel bad. It is better to love the desert and help others learn to love it and to know how important it is.

By completing this booklet, you are on your way to becoming a desert naturalist.

Wherever You Are

A naturalist is someone who observes and studies plants, animals, insects, rocks, and fossils. You have probably been a naturalist in some way from the day you were born. Write about a time you discovered and/or studied something in the natural world.

Online

Tracking Animals greenbelly.co/pages/animal-tracks-identification-guide

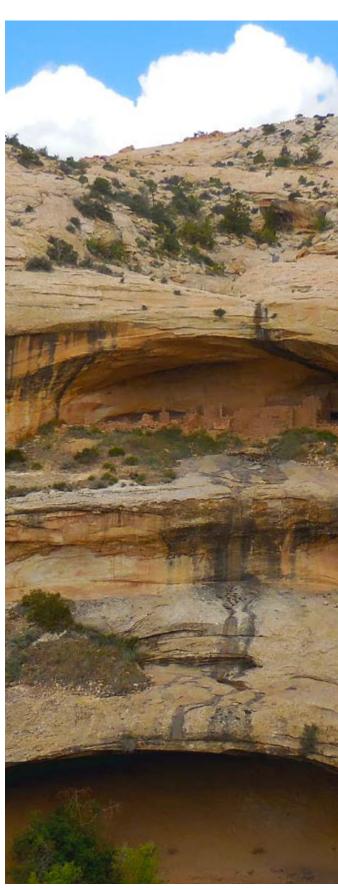
Restoring Native Plants
youtube.com/watch?v=780Dp2f9sQw

Outside

Go outside and observe. Do you see plants, animals, or insects? Can you see mountains or deserts? **Draw pictures of some of the different things you see.** By using the internet, books, or talking to someone who knows, identify what you see.

These are drawings of three of the things I saw and what they are:





The best way to learn about Utah deserts is to spend time in the desert. Perhaps you live in the desert now. Or maybe you vacation there or travel through during a trip elsewhere. If this true, see if you can take the time to get outside and just be in the desert. Find a "sit spot", and listen, look, and smell. No matter the season, Utah deserts are unique and beautiful.

The Five National Parks

Arches, Canyonlands, Capitol Reef, Bryce, and Zion... all of Utah's national parks are located in the desert. Each is similar, but they all have their own "flavor". There isn't enough room here to discuss all of them, but a quick online search can help you find out as much as you wish to know. Utah has more national parks than 47 other states!

Little Sahara Sand Dunes and Bonneville Salt Flats

These areas are reminders that in a big part of Utah there used to be both a giant lake and a sea. Some of the plants and animals found in these places can be found nowhere else.

Cedar Mesa and Grand Gulch Plateau

This is an area where the Ancestral Puebloans roamed and lived. There are lots of areas where structures and artifacts can be seen in their natural settings. It is important to never touch any artifacts you may find, and to leave nothing that belongs to you.

Dinosaurs!

If you are interested in ancient, giant creatures, the Utah deserts have a lot to offer. Most of the larger cities have dinosaur museums, but if you want to see the places where dinosaurs are found, definitely visit Dinosaur National Monument on the Colorado border or the Cleveland-Lloyd Dinosaur Quarry.

Wildlife Viewing

It might be difficult if you want to see desert wildlife. Many creatures sleep during the day. Still, consider Red Cliffs Reserve and Snow Canyon near St. George. Maybe you will get lucky and spot a chuckwalla or a golden eagle.

Wherever You Are

A bucket list is a list of experiences or achievements that a person hopes to accomplish in their lifetime. Write a bucket list of at least three places in the **Utah desert you want to visit or revisit.** Maybe you won't be able to go for years, but keep this list for the future. Search online if you want more ideas.

My Utah Desert Bucket List:

	1.
	2.
l	3.
l	4.5.6.
l	5.
	6.

Online

Grand Staircase youtube.com/watch?v=seQJTdBHWkk

Newspaper Rock seetheworld.travelforkids.com/newspaper-rockpetroglyphs-utah-fun-for-kids/

Outside





In Utah, there are many places where you see the symbols that the ancient native people used in their artwork. When we visit these places, we should never touch the petroglyphs or pictographs, or add our own marks. We can, however, draw pictures in the dirt with a finger or a stick, or on the sidewalk at home using washable chalk. We can also draw in the snow. Draw some symbols outside. Which are your favorites? Why?

You are a Naturalist Activity

Become Familiar with these Words

Antiquities: Objects that survive from earlier times and people.

Arch: A rock formation where an arch has formed due to erosion. To be considered an arch, there must be an opening that is at least three feet across.

Brumate: Similar to hibernation, except for cold-blooded animals. They will move around on warmer days rather than sleep the entire time.

Butte: Isolated hill or mountain with a flat top and steep sites.

Dormancy: State in which a plant is alive but not actively growing.

Ecosystem: An interconnected community of organisms (plants, animals, bacteria, fungi, etc.) and their environment.

Evaporation: Process where water dries up by changing from liquid to a vapor.

Hoodoo: Spire of rock usually consist of softer rock topped by a harder rock. Hoodoos are different from spires in that they have more variety of shapes and thicknesses.

Indigenous: People who are early, or the earliest, inhabitants of an area.

Mesa: An isolated flat-topped mountain that is smaller than a plateau but larger than a butte.

Naturalist: A person who studies or is an expert in nature and natural history.

Nomadic: Roaming from place to place.

Plateau: Large land area with a large flat raised surface, and sharper sides, also known as tableland.

Precipitation: Water from the sky in the form of rain, snow, hail, etc.

Salt Flat: Flat expanse of land covered with salt and other minerals which happens when the rate of evaporation is faster than the rate of precipitation. The minerals that were in the water get left behind.

Semiarid: Partially arid, or dry. When talking about an environment, it usually means a place that gets around 25-51 centimeters (10-20 inches) of precipitation per year.

Spire: An up-thrust column of rock and earth, usually formed from the erosion of what was once a butte.

Succulent: Plants that have thickened, fleshy parts that help retain water in arid climates.

This is your chance to come up with an activity for someone to learn more about the deserts of Utah.

Wherever You Are

This activity should be able to be completed wherever the person is. What would you like them to do?

Outside

Come up with an activity for someone to do outside that will help them become an observer of the natural world, preferably something that has a desert focus. Remember, however, that not everyone will be able to visit the desert. (Hint: Ask your learners to find patterns, discuss how things change or stay the same, how things work together, what causes things to happen and what the effect is.)

Online

Find one or two online resources for information about Utah deserts. Make sure that they are interesting and appropriate for students who are in 3rd –6th grade.

Sources and Additional Resources

Utah Junior Naturalists

Books

Alice Eastwood's Wonderland,
The Adventures of a Botanist
by Carol Green Wilson (adult book)

Desert Solitaireby Edward Abbey (adult book)

The Desert is Theirs
by Bird Baylor (children's book)

Creatures of the Desert Worldby National Geographic Society

One Day in the Desertby Jean Craighead George

Online

What is a desert biome conserve-energy-future.com/desert-biomes.php

Wild About Utah, A Utah Public Radio Production wildaboututah.org/

Utah National Parks nps.gov/state/ut/index.htm

Utah Department of Natural Resources **naturalresources.utah.gov/**

Native Americans in Utah

pbsutah.org/native-american-heritage-collection? gclid=CjOKCQjwmpbOBRCBARIsAG7y4zaK6vHeeGu tNJPXI6BdXmw3wCsZ6Um7RAtH6pwQpUvh4ywY8R eeDXAaAj1gEALw_wcB

utah.com/culture/native-american-tribes

Utah Geology **geology.utah.gov/**

Desert Adaptations/Animals desertmuseum.org/books/nhsd_adaptations_birds. php

Desert Adaptation/Plants
desertmuseum.org/programs/succulents_
adaptation.php

Image Credits
file:///Users/vallyse/Desktop/DesertImage%20
Credits.html

As our Junior Naturalist series is developed, it will be designed to be used by students of all ages, with each level being geared towards a specific age group or learning need.

Explorer Naturalist Series

These books are designed to be used by all ages, but are specifically geared towards students ages 8-11.

Explorer Naturalist: Utah Deserts Explorer Naturalist: Utah Mountains* Explorer Naturalist: Utah Water*

*under development

Future series planned:

Junior Naturalist Series

-In development

This second level will be able to be used as a continuation of the Explorer Naturalist Series, or on its own. It will be geared to ages 11-14, and will consist of three booklets.

Junior Master Naturalist Series

-In development This series will be recommended for students ages 14-18.

Acknowledgements

Developed by Val Allyse, with use of resources from the Utah Master Naturalist program by Mark Larese-Casanova.I would also like to thank and acknowledge the intellectual contributions of the following educators: J. Boling, T. Collins, D. Joy, B.Knighton, L. Matheson, J. McLean, J. Nielson, K. Oliver, and K. Worthen.

The Natural History Museum of Utah is committed to providing inclusive experiences for all students. Please contact us if you have questions or to offer feedback and suggestions that will help to enhance the program for everyone.



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