DESERTS

VOCABULARY:

mesas - large, flat-topped hills

buttes - columns of rock in desert areas

drought - a long period of dry weather with little or no rainfall

mirage - an optical illusion caused by heat

oasis - a fertile area in a desert where underground water flows to the surface or there is a permanent river

wadis - steep-sided valleys in desert areas that have been carved out by water

WHAT IS A DESERT?

- Most deserts are in warm regions, but others can be extremely cold.
- Areas around the North Pole and South Pole are cold deserts.
- All deserts are dry.
- They receive less than 10 inches of rain or snow each year.
- Desert landscapes include gravel, boulders, mountains, and sand.
HOW IS A DESERT FORMED?

- Most deserts lie on either side of the equator, in areas known as the tropics.
- There are 3 types of deserts.
  1. Tropical deserts - warm air flows from the equator to the tropics, the air rises and cools producing rain (in the rain forests), when the air moves back toward the ground it warms up and sucks up all the moisture in the ground (ex. Sahara Desert, Africa)
  2. Rain-shadow desert - as air rises over mountains it cools and releases rain, as the air moves down the other side it is warm and dry (ex. Taklimakan Desert, China)
  3. Coastal desert - air moves across cold ocean waters and loses its moisture before reaching land (ex. Namib Desert, Africa)

DESERT TEMPERATURES

- Clouds act as insulators. They can keep sunrays out during the day, and keep the earth’s heat in at night.
- Skies over tropical deserts have few clouds. In the summer temperatures are as high as 120° F and in the winter temperatures are around 90° F.
- Coastal deserts have cloudy skies. Temperatures stay about the same year round, day or night.
- Skies over rain-shadow deserts have few clouds. The summers are as hot as in the tropical deserts, but the winters are cold.
WHERE ARE DESERTS LOCATED?

- Warm desert regions are found in the low and middle latitudes (from 60°N - 60°S).

- Low-latitude deserts receive direct rays from the sun most of the year. They are warm year round.

- Middle-latitude deserts receive slanted rays of sun. They are hot in the summer, but cooler during the winter.

- Deserts are also found in the areas surrounding the North and South Poles. These deserts are called polar deserts.

- Deserts are found on the following continents (see map on reverse)

  North America  Asia
  South America  Australia
  Antarctica     Africa

* Europe is the only continent without a desert.

* The largest desert is the Sahara, found on the continent of Africa.
DESSERT PLANTS

VOCABULARY:

ephemerals - **plants with a short life cycle**

perennials - **plants that have a lift span of more than 2 years; store nourishment**

succulents - **plants with thick, fleshy leaves or stems that conserve water**

tuber - **the underground part of certain plants where food is stored (ex. potato)**

ADAPTATIONS FOR SURVIVAL

- Desert plants gather water through their **roots**. Roots are either spread out near the **surface** or grow deep down into moist layers of **soil**.
- Water can **evaporate** through plant leaves. So, **cacti** do not have leaves.
- Some succulent plants have thick, fleshy leaves that **store** water.

CACTI

- Cacti are well **adapted** to the desert.
- Cactus stems are **thick**. They are covered with a **wax** to help them hold in water. Some have **pleats** that can stretch when cacti take in water.
- Cacti also have **spines** or taste **bad** to repel hungry animals.
- **Barrel** cactus has one round stem. Its body is **green** with **pink** thorns.
• **Prickly pear** cactus has a fruit like a pear.

• The **saguaro** cactus grows in the southwestern U.S. It can grow up to 50 feet tall, with roots spreading over 35 feet underground.

  * **Gila woodpeckers** dig holes in saguaro cacti. Then, **elf owls** use the holes as a nest.

**OTHER DESERT PLANTS**

• **Yucca** plants have pretty flowers. Their leaves are used by Native Americans of the southwest to make **baskets**.

• Some desert plants, called **ephemerals**, avoid droughts by growing, flowering, and seeding themselves only when it **rains**.

• **Salt bush** has soft white leaves that taste **salty**.

**DESERT TREES**

• **Joshua** trees are related to yucca plants. They are **tall** and have heavy trunks with rough **bark**.

• The **baobab** is the biggest type of desert tree. It grows in **Africa**. It has the thickest **truck** of any tree — up to 30 feet around. This allows it to store a lot of **water**.
DESERTS OF NORTH AMERICA

WARM DESERT REGIONS

- North America has 3 types of warm deserts.
  1. **Tropical** deserts are found near 30°N along the border of the United States and Mexico.
  2. Cold currents from the Pacific Ocean form a coastal desert along the western coast of Mexico.
  3. **Rain-shadow** deserts are found between the Sierra Nevadas and Rocky Mountains.

U.S. DESERTS (map on back)

- Deserts are found in the southwestern part of the United States.
- There are 2 types of deserts found here.
  1. **Tropical** deserts are found near 30°N by the country of Mexico.
     Examples: Arizona-Sonoran Desert
                Chihuahuan Desert
                Colorado Desert
  2. **Rain-shadow** deserts are found in the Great Basin between the Rocky Mountains and the Sierra Nevadas.
     Examples: Great Basin Desert
                Painted Desert
                Mojave Desert
NATIVE AMERICANS OF THE SOUTHWEST

VOCABULARY:
pueblo - a village
adobe - a desert clay

THE PUEBLO
- The Pueblo are a group of Native Americans that live in the southwestern part of the United States.
- Their ancestors, the Anasazi, were among the first people to live in these deserts.

FOOD AND WATER
- Villages were usually built near rivers or springs.
- The Pueblos made pottery out of desert clay to carry and store food and water.
- The Pueblos were hunter-gardeners. They gathered seeds, nuts, and berries. They hunted small animals with nets. They grew crops of corn, beans, and squash and raised turkeys.

CLOTHING
- The Pueblos made blankets and clothing from feathers and fur.
- Farmers also raised cotton, which was woven into cloth on a loom.

APARTMENT HOUSES
- The Pueblos built the first apartment style houses in our country.
- They built walls of flat rocks, held together with adobe, which becomes rock hard when it dries in the sun.
- Sometimes these apartment houses were built right into the side of a cliff.
- All of the Pueblos of a village lived in one large building, often many stories high.
Native Americans of the Southwest

The Southwest Native Americans come from the states of Arizona, New Mexico, Colorado, and the northern part of Mexico. Most of the land is desert covered with cactus. These Native Americans are known as the Pueblo. The main tribes that come from the Southwest area are the Apache, Navajo, Hopi, and Zuni. Some tribes spoke their own languages, had their own religious customs, and laws they followed. Most of the Southwest Native Americans became farmers and lived in villages.

The Pueblo people are descendants of the Anasazi culture. Their culture is the oldest north of Mexico. Several of the two dozen surviving pueblos have retained pre-Spanish social systems and community organizations to a degree. They are sedentary farmers. The men are weavers and the women are potters. The Pueblo tribes further developed farming, pottery, textiles, and a complex mythology and religion. The men built a large underground chamber called kivas for secret ceremonies. A modern kiva is a rectangular or circular shape with a pit fire in the center and a timbered roof. An opening in the floor represent the entrance to the lower world and the place through which life emerged into this world.

Apache Indians

The Apache ancestors were said to enter the area around 1100 B.C. and were once joined by the Navajo. The Apaches were known as fierce fighters. They often attacked U.S. settlers. Two important Apache chiefs were Cochise and Geronimo.

They lived on wild game (including buffalo), seed and fruit gathering, and some farming. The women gathered food, wood, and water. The men went out to hunt and raid. The men lived with and worked for their wives’ families. Most Apaches lived in wickiups — dome-shaped brush huts made by the women. Some lived in tepees made of buffalo hide.

Today, they live on reservations totaling over 3 million acres in Arizona and New Mexico. They also still continue to practice many of their tribal customs. In 1990, there were 50,051 Apaches in the United States.
NAVAJO INDIANS

The Navajo, or Dine as they call themselves, is the largest tribe of North American Indians. Long ago, the ancestors lived in Northwestern Canada and Alaska. Over 1,000 years ago they began to travel south and reached the southwestern United States. They met farmers who are known as Pueblo Indians, and the Navajo began to settle near them and learn from them.

The Navajo learned how to plant corn, beans, squash, and melons. The Navajo also began to learn a similar style of weaving, making clothing and art from the Pueblo Indians.

The Navajo Indians lived in homes called hogans. They are made from wooden poles, tree bark, and mud. The doorway opened to the east so they could welcome the sun.

After the Spanish settled in the 1600’s, the Navajo began to steal sheep and horses from them. The Navajo started to use the animals in their daily life. They used the sheep for its wool to make clothes, blankets, and rugs. They also used the sheep for food. They used the horses to travel longer distances and also used them to begin trading. The Navajo began making items to trade in towns. There were also trading posts built on reservations to sell their handmade crafts, such as pottery and blankets.

The Navajo reservation is currently the largest in the United States. It has over 140,000 people with 16 million acres most of which are in Arizona. They still weave from wool and use natural vegetable dyes for color. Today, people live like the old days the best they can with the modern lifestyle, but others use modern technology to live.

HOPI INDIANS

The Hopi Indians, which means good, peaceful, or wise, come from a group of Southwestern people called Pueblo, but their language is different. They live in northeast Arizona at the southern end of the Black Mesa. The pueblo of Oraibi on the 3rd Mesa started in 1050, and is the oldest in North America that was lived in continuously. They live in pueblos that are made of stone and mud and stand several stories high.
The Kivas are an underground chamber in the pueblo home that they used to talk and have religious ceremonies in. They used the kivas for 100 years. The center of the floor had a fire pit. You had to climb down a ladder to get to the south end where a bench was placed for spectators. At the north end was a small hole in the floor as a reminder of sipapu.

The Hopi Indians grew food similar to the Navajo Indians. They raised corn or maize as the basic food. The Hopi Indians based religious ceremonies on the corn they grew. They grew 24 different kinds of corn, but the blue and white was the most common. They also grew beans, squash, melons, pumpkins, and fruit.

The women and men each have specific jobs or duties they perform. The women own the land and the house. They also cook and weave the baskets. The men plant and harvest, weave cloth, and perform the ceremonies.

The Kachinas are also used in the Hopi tribe. They are powerful ancestor spirits called to bring rain to help the crops grow. There are over 300 different Kachinas. They also made Kachina dolls to give to the girls in the tribe and to sell to tourists.

Today, the Hopi Indians are divided into traditional -- which preserve ancient lands and customs, and new -- who work with outsiders. The Hopi Indians today love their traditions, arts, and land, but also love the modern American life. Their kids go to school and they use medical centers. The Hopi live and work outside of the reservations. Troubles with the Navajo whose reservations surround the Hopi still continue today.

ZUNI INDIANS

The Zuni are an Indian tribe who reside on the Arizona / New Mexico border, along the Zuni River. In physical appearance, culture, and social organization they closely resemble the Hopi. Physical evidence of permanent dwellings date their existence in the region back as far as 700. Their first encounter with the white man came in 1540 when the Spanish explorer Coronado conquered the Zuni. At the time the Zuni -- who refer to themselves as Ashiwi -- were living in seven separate villages.
The life for these agricultural people revolves around their religious beliefs. They have a cycle of religious ceremonies, which takes precedence over all else. Their religious beliefs are centered around the three most powerful deities – Earth Mother, Sun Father and Moonlight-Giving Mother. The Sun is especially worshipped. In fact the Zuni words for daylight and life are the same word. The Sun is, therefore, seen as the giver of life. Each person’s life is marked by important ceremonies to celebrate certain milestones in their existence. Birth, coming of age, marriage and death are especially celebrated. The Zuni are also very family and community oriented and have also endeavored to live a peaceful non-threatening existence.

The Zuni people have traditionally been planters and farmers. Corn has always been the most important crop. An ongoing problem for them has always been the lack of rainfall. The rainfall is very erratic. At times fierce storms can ravage the landscape but more typically precipitation will be erratic and slight. The Zuni, therefore, built dams to collect water. This would allow them the resources to build up storage of their invaluable corn, often having two years worth in reserve. The Zuni men are also hunters. They will go for deer, rabbits, birds and assorted other small animals. The women are responsible for the preparation of food as well as for preparing their own small gardens, located closer to their village. They will grow such things as chili, herbs and spices.

The Zuni are known the world over for the making of pottery, which has been happening from the earliest of times. Traditionally women have been the potters among the Zuni. In recent times, however, more and more men have become potters. Today, there are more male than female potters among the Zuni. Clay for the pottery is sourced locally. It is prepared by grinding, sifting and mixing with water. After the clay is shaped into a vessel or ornament it will be scraped smooth with a scraper. Then a thin layer of finer clay will be applied to the surface for extra smoothness. Next the vessel will be polished with a stone. Then the piece is painted with a traditional yucca brush. To fire the pottery the Zuni use sheep dung. The kilns used have not changed for hundreds of years. Today their economy relies upon the sale of pottery as well the fine hand made jewelry for which they are also well known.

The Zuni live in flat roofed, stone adobe houses (pueblos). The Zuni Reservation is isolated from the outside world. This allows the people to go about their existence relatively unencumbered by modern western civilization.
Southwestern Native American Art

Pottery, clothing, and making baskets are just a portion of the great arts and crafts of the Southwest Native Americans. Their art used symbols and signs to represent their ideas, beliefs, dreams, and visions. Pottery was made for everyday use, including cooking, storage, bathing, and religious ceremonies. They were painted and carved with designs that told a story.

The clothing they wore depended on what they did. They lived in a warm climate so they wore little clothing. They would dress in flowers and paint with feather headdresses. They also used clothing to signify their fighting skills.

Kachina dolls were carved out wood by the Zuni and Hopi tribes. They clothed them in masks and costumes to look like the men who dressed up as Kachina spirits. They were given to children to teach them to identify the different parts of Kachina dolls, and the parts they play in tribal ceremonies.

Turquoise is mined by southwestern tribes, and is the stone of happiness, health, and good fortune. They use turquoise to make jewelry. The southwestern tribes also collected good luck objects called fetishes. They kept them in bowls painted with crushed turquoise. The Navajo are known for silverwork, which they learned from the Mexicans. The Navajo Indians developed silver working techniques used for jewelry, and made belts from sterling silver.

The Navajo also created sand paintings for religious rituals and ceremonies.

The Southwest Indians were the most skilled in making baskets. They would decorate the baskets with colors and patterns. They could be very symbolic like the art they made. The Hopi method of basket making has not changed for hundreds of years. The Apache were most well known for their basket weaving.

All of these items mentioned above were ways for the Southwestern Native Americans to communicate their dreams, visions, and beliefs to each other or to people today.

**PLEASE CLICK ON THE LINK ON THE MAIN “DESERTS” PAGE FOR THE “NATIVE AMERICANS OF THE SOUTHWEST” CHART**
DESSERT ANIMALS

VOCABULARY:
nocturnal - active at night

ADAPTATIONS FOR SURVIVAL
- Most deserts are hot and dry. Animals keep cool by:
  - sleeping under rocks during the day
  - burrow under the ground all day
  - staying out of the _____ sun
- Many animals are nocturnal; they only come out at night.
- Desert animals get water by eating plants and other creatures.
- Most desert animals can close their eyes, ears, and nostrils to keep out sand.
- They have tough skin and strong teeth for eating spiny, prickly plants.

** For each of the following categories choose 3 animals and write about the adaptations they have for living in the desert. **

** Facts chosen by students will vary **

DEsert MAMMALS
1. __________________________________________________
   __________________________________________________

2. __________________________________________________
   __________________________________________________

3. __________________________________________________
   __________________________________________________
DESERT REPTILES
1.

2.

3.

DESERT SPIDERS AND INSECTS
1.

2.

3.

DESERT BIRDS
1.

2.

3.
SURVIVAL IN THE DESERT

PREPARING FOR YOUR TRIP

- To travel to deserts in foreign countries you will need a **passport** and **certificates** to show that you have been vaccinated against illnesses.
- You also need **radio** equipment to keep in contact with people who could **rescue** you in case of emergency.
- You should have **snakebite** kit in case you are bitten. Never try to **suck** the poison out — it could **kill** you!
- **Knapsacks** work well for carrying equipment. Pack everything in plastic bags to keep out **dust** and **sand**.
- You will also need a **compass**. Aerial **photos** of the desert are also helpful, if they are available.
- To keep cool and protect yourself from sunburn wear **loose-fitting** cotton clothes that cover as much as possible. Also, be sure to put on **sunscreen and a hat**.
- The desert can be very cold at **night**, so pack a high-quality **sleeping bag**. To avoid snakes and scorpions use a **hammock** or **cot** to stay off the ground.
- **Water** is crucial to your survival. You may need at least 3 gallons a day. Store it in large **plastic** jugs.
- Also bring a unbreakable **mirror** to use for signaling for help in an emergency.

SURVIVAL TIPS

- **WATER**
  - Always check your **water** supply. Never rely on **maps** to find water sources.
  - If you run out of water, **conserve** the water in your body by traveling at night when you won’t **sweat** in the hot sun.
  - If you have water that is unfit to drink, wet your **clothes** with it to help keep your body cooler.
• To get emergency water, build a **desert still**.

  ➢ DIRECTIONS:
  1. Dig a **hole** and put a **bucket** in the bottom.
  2. Cover the hole with **plastic wrap** and seal the edges with **rocks**.
  3. At night **moisture** will collect on the plastic and drip into the bucket.

➢ **EMERGENCY RESCUES**
  • If you have a **vehicle**, stay with it.
  • Use your **mirror** to signal for help.
  • Arrange **rocks, clothes**, etc. in the shape of an “X” to be seen from the air.

➢ **AVOIDING DANGER**
  • Watch and listen for dangerous **animals**.
    ex. snakes, scorpions, mosquitoes, sand flies, etc.
  • If you are bitten or stung, remain calm and wait for **medical** help. If help is too far away, use your **snakebite** kit.
  • Don’t be fooled by **mirages**!
  • Sandstorms:
    • If you are traveling by **vehicle**, STOP, close all **windows** and air **intakes**.
    • If you are traveling by camel, make the camel lie down, cover your **face** and **sit** next to the camel until the storm passes.
    • Before moving on after a sandstorm always check your **compass** to make sure you are still headed in the right direction.
Internet Research — Deserts

Go to Mrs. Bellen’s Web Page and click on “Missouri Botanical Gardens”. Use the MBG Learning Network to complete the notes below.

- **Click on the cactus below the title “Deserts”**
- **Click on “What is a Desert Like?” (scroll down the page)**
  1. The desert is often very **hot** in the day and **cool** at night.
  2. There are less than **10** inches of precipitation per year.
- **Click on “Types of Deserts”**
  3. There are two kinds of deserts, **hot** and **cold**.
  4. Write “hot” or “cold” after these important deserts.
     
     Australian **H**  
     Chihuahuan **H**  
     Mojave **H**  
     Sahara **H**  
     Sonoran **H**  
     Gobi **C**  
     Great Basin **C**
- **Click on “Desert Plants”**
  5. Desert plants have two main adaptations:

    the ability to collect and store water

    features that reduce water loss

  6. **Click on some of the questions, in the left window, to find out about desert plants.** List 5 plants that grow in the desert: saguaro cactus, barrel cactus, old man cactus, prickly pear, aloe
- **Click on “Desert Animals”**
  7. Desert animals face challenges to survive, including **lack of water**, **intense heat**, and **searing sun**. They may adapt by **hiding underground** or by **being nocturnal**.
  8. 5 examples of desert animals are: dingo, fennec fox, Gila monster, sidewinder, thorny devil
DESERT STUDY GUIDE

VOCABULARY:

- mesas
- buttes
- drought
- mirage
- oasis
- wadis
- nocturnal

- ephemerals
- perennials
- succulents
- tuber
- pueblo
- adobe

FROM YOUR NOTES...

✓ Identify 3 types of deserts
✓ What makes a place a desert
✓ Where are deserts located
  - hot and cold
  - continents that have deserts
  - deserts of the U.S.
  - largest hot desert
✓ Examples of desert plants and animals
  - types of adaptations they have for survival
✓ Facts about Native Americans of the Southwest
  - tribes
  - food
  - crafts
  - homes
✓ Give examples and identify necessary items/equipment for survival in the desert