PREHISTORIC
PEOPLE
OF THE
DESERT
FOREWORD

These instructional modules were prepared with a specific setting and several general themes in mind. The assumptions are that: the modules will be used at the Desert Studies Center, a teaching and research facility in the Mojave Desert or at a place like it, with similar facilities; the lessons are aimed at grades 4 through 12; the students will be at the Desert Studies Center for at least one night.

Three themes have been chosen to tie these educational modules to a cohesive conceptual framework. They are: Daily Life, Ceremonial Life and Harmony with the Natural World. These themes represent significant elements of prehistoric lifeways which can be explained through simple classroom exercises.

These activities have been reviewed by Dr. Barry Thomas, science educator, California State University Fullerton. The manuscript was subsequently edited by Ms. Laurie Dieppe, whose contribution is gratefully acknowledged.

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EDUCATIONAL MODULES

A. DAILY LIFE of the Prehistoric Desert Dwellers

1. Making a Clay Pot
2. Making a Spirit Bag
3. The Moieties Competition - the Bone Toss Game

B. CEREMONIAL LIFE

1. Dividing the Group into Moieties
2. Painting Our Faces for the Campfire
3. Acting Out Two Desert Myths
   Myth No. 1: How Desert Woman Made the Earth
   Myth No. 2: How the People Were Made

C. HARMONY WITH THE NATURAL WORLD

1. Making a Desert Crossing
   Route One to the North
   Route Two to the South
2. Marking the Sun's Journey Across the Sky

D. SUPPLEMENTAL MODULES
BACKGROUND

Around 1,000 years ago, the Indian people who used the area around the Desert Studies Center were the Chemehuevi and the Mohave. The Mohave Indians lived mostly along fertile shores of the Colorado River, where they built houses, made pottery and grew crops. The Chemehuevi were true desert Indians, moving from water hole to water hole with the seasons. They had to make do with what they found around them for food and shelter.

There is much that we all can learn about resourcefulness, about not wasting what we have, and about our past, from studying prehistoric people. Because they lived outdoors with nature, the people learned to understand their world, to know its ways. They used the desert and they also respected it, a lesson we modern desert residents must learn.

These teaching modules are designed to help teach about Native American understanding and respect for the desert world in a general way. The modules are meant to be flexible to encourage creativity and to allow for the substitution of materials.

WEEKEND SCHEDULE

The purpose of this schedule is to illustrate how these instructional modules might be used during a visit to the desert. It is designed to be used by a class between the fourth and twelfth grades who are using the Desert Studies Center, or a facility like it, for two consecutive days with at least one overnight.

Important note: the ceramics module (A.1) requires two days to complete. Facilities at the Center for firing clay are not presently available; therefore, the clay pots will take at least 24 hours to air-dry to a reasonable firmness. Thus Module A.1 must be started on the first day.

FRIDAY:

Check supplies. Each module has a materials list in front of the directions. Put clay to soak in bucket of water overnight if dry (Module A.1).

Divide class into moieties (Module B.1).

SATURDAY:

BREAKFAST

Set up gnomon (Module C.2)

Begin ceramics (Module A.1)

Moieti Competition: Bone Toss Game (Module A.3)

LUNCH
Take Desert Crossing hike (Module C.1)

Finish gnomon (Module C.2)

Do face-painting (Module B.2)

DINNER

Campfire: Act out Desert Myths (Module B.3)

SUNDAY:

BREAKFAST

Finish ceramics (Module A.1)

Make spirit bag (Module A.2)

Modifications:

Make the Spirit Bag on Saturday afternoon or take the Desert Crossing hike on Sunday, before the (long?) bus ride home.

In addition to the eight modules presented in this report, several supplemental modules were conceived for this project. These modules were not formally included for a variety of reasons; such as, the availability of materials is uncertain (gourd rattles, sand-painting), or the skill level might be too high for young children (weaving fronds). With these obstacles overcome these class projects could be substituted on the schedule:

1. Make gourd rattles out of dried Coyote melons.

Coyote melons are sometimes very abundant in the sandy areas south of the Desert Studies Center. If they were cultivated or regularly collected and dried, they could easily be cut in half to make small bowls or used whole, mounted on a stick, filled with seeds, decorated and painted.

2. Weave mats from dried palm fronds.

Washingtonia palm fronds are readily available at the Desert Studies Center. They can be split into one-half inch strips for weaving into mats or baskets. When very dry, the fronds become brittle and difficult to work with; use of green fronds must be approved by Desert Studies Center staff.
3. Make sand paintings.

Sand in a number of colors and grain sizes is available at Bruebaker and Mann in Barstow. Their logo is clearly visible on the hillside on your left as you head northeast toward Las Vegas on Interstate 15. For teachers who bring their own containers, small amounts of sand can be had very inexpensively. Other materials needed would be white glue, yarn or string for making outlines, and cardboard or matboard backing.

4. Make rock art replicas.

For most students, making rock art images with foam rubber printing pads is great fun. Using pictures from books as guides, cut the shapes of petroglyphs out of thin foam rubber and glue to a piece of cardboard. Paint the foam rubber shapes with tempera paints and press them on a paper tablecloth. Use spray bottles filled with tempera paint to spray around a hand.
RESOURCES

Cushing, Frank

Heizer, Robert F. and Albert B. Elsasser

Kroeber, A.L.

Laird, Carobeth

Russell, Frank

Smith, Gerald A.

Waters, Frank
MODULE A.1:  
MAKING A CLAY POT

Theme A: Daily Life

Background

Compared to the early cultures of the Southwest, pottery was a relatively late arrival to the Indians of Southern California. The prehistoric desert people were hunters and gatherers who, in the early times relied on gourds, skins and baskets to store and carry food and water. In later times, perhaps around 500 A.D., the desert people learned about pottery from tribes such as the Mohave and the Yumans who live along the Colorado River.

Making pots from clay was very popular with Native Americans, even though clay dishes were fragile and tended to break when the people moved around a lot. Different tribes traded pots with one another and each group decorated their pottery in their own way. Today we can tell who made a pot by the designs on it.

To make pottery, the Indians had to find a deposit of smooth clay free of dirt and stones. This clay was dug and spread out in the sun to dry. It was then pounded in a mortar to make a fine clay flour. Clean sand or finely crushed rock, called "temper", was added to the mixture to keep the pot from cracking as it dried. Water was the final ingredient, and then everything was kneaded together.

Clay pots were used to store food and water, and even to bury the dead. When a pot broke, they might try to mend it with mud and twine, but if this wasn't possible, they could still use the large pieces as seed-parching dishes. Seeds were toasted in shallow potsherd dishes, which were heated on the coals at the edge of the campfire. Archaeologists find the potsherds which have been blackened by fire when they dig in the desert.

This module teaches about the daily life of the prehistoric desert people and how they stored their food and did not waste even the broken pottery. Although our pots will not be fired in the kiln, when sun-dried they will be strong enough to hold seeds and to be decorated. However, they must not be used with liquids.
Materials

* School clay - 50 lbs. makes 2 pots for 15 students
* pencils or nails to make holes in beads
* popsicle sticks or shells for marking outside
* flat rocks for smoothing
* tubes of acrylic paint, "earth tones", if possible brushes, water containers

Directions

Preparing the clay -- school clay stored at the Desert Studies Center will be subject to extremes of temperature and dryness. If you are not bringing clay with you, be sure to check the clay when you arrive at the Center to see if it should be SOAKED OVERNIGHT if it has dried out.

Making a pinch pot -- The easiest pot shape to make is the "pinch pot". With the clay slightly moistened, shape a ball of clay into a bowl by keeping the thumbs inside and the rest of the fingers outside and rotating the clay. (See illustrations for examples of vessel shapes.) Have each student put his name on the bottom.

Making a coiled pot -- Coils are made by rolling clay into long, thin sausages. The bottom of the pot is made first, by coiling clay into a flat spiral. The walls are made by pressing the coils together and working up the sides. Smooth the sides with moistened fingers or use the "paddle and anvil" method. The "anvil" is a firm surface on the inside of the pot, like a large flat rock, and the paddle smooths lightly on the outside. Paddle-and-anvil pottery is the most common type for the Southern California desert areas. Another way to get the bowl shape is to smooth coiled clay over a bent knee.

The finished dish or pot should be placed outside in the sun to dry and left out overnight. Note: The clay walls of the pots must not be too thick (not more than 3/8 of an inch thick) or they won't dry overnight.

For painting the pots, acrylic paint applied with a soft brush is best, as tempera paint rubs off on the hands after drying. Have each moiety (see Module B.1) mark their pots with their symbols and colors.

Making clay beads for the Spirit Bag (see Module A.2) -- make clay beads by rolling clay into balls or tubes. Pierce the wet clay with a nail or pencil to make the hole. Be sure to make a large hole so the clay will dry overnight. Decorate the beads while wet and then paint them when they have dried.
Modifications to the Basic Module:

Collecting Local Clay

Instead of using just school clay, local clay gathered from the Silver Lake beds or elsewhere can be added. If the clay is in a dried form, it will need to be soaked before it can be worked into a mixture with school clay.

Adding "temper"

Prehistoric potters added clean sand or crushed rock to their clay mix to prevent their pots from cracking as they were fired. Sand can also be added when the clay is wet before the coils are formed. Sand with a lot of mica in it gives the clay a special sparkle. Use the local sand, with advice from the Desert Studies staff on where to collect it.

Decorating the pots

Native American people often decorated their pottery by incising the wet clay with different materials, such as the edges of seashells or the ends of hollow reeds. A nearly infinite variety of patterns is possible using natural objects. Hard seeds or small rocks can be pressed into the wet clay and allowed to dry. After the pots have dried, they can be painted with acrylic paints.
MODULE A.2: MAKING A "SPIRIT" BAG

Theme A: Daily Life

Background

A "spirit bag" is a made-up name for a small pouch that many desert Indians carried with them everywhere they went. They wore it on a string about their neck or around their waist. It was used to carry small items that had personal meaning, such as things that help you remember a special time or a special person, or your lucky charm. You might keep a pretty rock or a special bird feather in a spirit bag.

The Hopi people make small charms in the shapes of their totem animals by carving pretty polished rocks. Today we call these "festishes". The Hopi keep their charms in their spirit bags and say they bring good luck.

A SHAMAN, or Indian medicine man, carries a special spirit bag. His pouch contains plants and powders which he uses to try to cure the sick people in his tribe. He might make sand paintings as part of the healing ritual, and would keep his colored sands in his spirit bag.

Materials

*burlap or other fabric or leather scrap, enough for one 6 in. X 18 in. piece per student
*leather thong, bootlace or shoelace, or heavy yarn
*nail or awl to make holes for lace in pouch material
*clay beads (see Module A.1)
*acrylic paint to decorate
Directions (see diagram)

Using scissors, cut material into rectangles roughly 6 inches by 18 inches. Fold material in half lengthwise, so that you have a two-sided rectangle 9 inches by 6 inches with open top and sides. Make holes in the sides of the pouch with a nail or pencil. Thread a leather strip through the holes in the burlap.

Start at the bottom of one side of the pouch and thread in and out up the side, across the top and down the opposite side. Make large knots at the beginning and the end. Excess leather left at the top makes a strap handle to carry the pouch.

Another way - use a large square of burlap and make holes in a circle out about two-thirds from the center, near the edge of the fabric. Thread the leather strip through the holes and pull tight to make a round-bottom bag. Tie leather strip at the neck.

Decorate the spirit bag with the clay beads from Module A.1. Sew or tie the beads to the bag using the leather strips. Paint the spirit bag with acrylic paint in the moiety colors.
MODULE A.3:  
PLAYING AN  
INDIAN GAME  
"The Bone Toss"

Theme A: Daily Life

Background

This game is an adaptation of a desert peoples' gambling game. The prehistoric Indians of California were great gamblers and invented many games which they played together in camp at special yearly gatherings. Of course, they didn't have money as we do, so it wasn't exactly like our idea of gambling, which we don't wish to promote. We have modified "Bone Toss" to make it more of a children's game to give students a feeling for how the desert people played and passed their time in group activity.

Materials

*Dominos, preferably of polished stone or bone. As four students need only four dominos, one full set might be enough for the whole class  
*unpopped popcorn kernels, to keep score  
*clay bowls
Directions

The class is divided into groups of four, composed of two members from each moiety. The team members sit opposite each other, as in bridge. A large number of unpopped popcorn is placed to the side in a clay bowl. Each group has four domino tiles.

1. The person sitting facing the north plays first. He/she takes one tile (the recorder tile) and places it either face up (dots up) or face down (blank), depending on how he/she wants the other three tiles to fall. Then he/she takes the other three tiles, shakes them, and tosses them at least three feet in the air. All players observe the results. The rewards are as follows:

   All 3 tiles falling the same as the recorder tile = 4 kernels

   2 tiles the same and 1 different = 2 kernels

   1 tile the same and 2 different = 1 kernel

   All 3 tiles are different from the recorder tile = loss of all kernels!

   If a tile lands on its side, it is counted as different from the recorder tile.

2. The first person to play then removes the correct number of kernels from the clay dish and adds them to his/her pile. If he/she must give up all kernels, they are put back in the clay dish.

3. The other three players do the same, with the turns moving counterclockwise, with each person adding to or subtracting kernels from their own piles.

4. At the end of ten cycles around the square the game is over. The team members (members of the same moiety) add their kernels together and compare their total against that of the opposing team. The side with the smaller number of kernels is considered the loser.

Those two members of each group of four, with the other losers from each group, must then run to a point designated by the teacher and back. This little race is to bring "Coyote luck" to the losers. It is to remind the people of how Coyote stole fire from the gods for mankind. Coyote had to be fast to be successful, so we show Coyote we can run as fast as he did so we can be lucky too.

5. All members of one moiety rotate to the next square of four for the next turn. The competition resumes.

6. The teacher may keep track of how many "wins" each moiety has and at the end of the session, the winning moiety watches while the losers run. The winners must not make fun of the losers, as Wolf, who always won, never laughed at Coyote.
MODULE B.1: DIVIDING THE GROUP INTO MOIETIES

Theme B: Ceremonial Life

Background

The anthropological concept of a moiety is used here in a non-technical way, meaning a system for dividing all the people of a tribe (or a class) into two equal parts.

Many native people around the world have moieties so they can know who is an eligible marriage partner and who is not. It would be very bad to marry someone from your own moiety; it would be like marrying a member of your own family. The two moieties of the Cahuilla Indians are Coyote and Bobcat, the ancient Anasazi had Sun and Moon people, and the Miwok Indians of California divided themselves into Land and Water people, with associated plants and animals.

This module calls for dividing the class into summer and winter people. One method for determining a student's moiety is to go by his birthdate, with April through September as summer and October through March as winter. Another method would be to have the class count off as even/odd or one/two. Moieties are really arbitrary divisions of the entire society into two even parts. For this teaching module, it is important that the division is NOT based on sex or age. The two moieties should have a roughly equal number of members.

For the Cahuilla Indians, a child's moiety is the same as his mother's and the opposite of his father's. A Cahuilla boy with a Bobcat mother is a Bobcat himself, as are his brothers and sisters. His father must be a Coyote. When he grows up, the Bobcat boy must take a Coyote woman to be his wife.

Understanding these relationships introduces the anthropological concept of kinship. Kinship customs in a society tell the people how to determine who their relatives are. We all need to know which family group we belong to and who else is in our group with us. This is essential for human survival and well being and is taught to all children at a very early age.

People all over the world have special rules and terms just as we do for describing their kinfolk. We English speakers commonly use such labels as "cousin", "aunt" and "grandfather". We even have terms like "step-mother" and "first-cousin-once-removed". Most Native American cultures have even more specialized names for relatives than we do.

Materials

none
Directions

Divide the class - As soon as the group assembles at the Desert Studies Center, divide the class into moieties, two roughly equal groups. Do this by using birthdays or have the class count off. Call one group summer and the other winter. Your moiety is your kinship group for the weekend.

Separate into two groups - Have each moiety meet in a separate place and choose at least two colors and one animal as a mascot or "totem" to represent that group. The class will use the moiety colors, names, and totems throughout the weekend in the other modules.

Colors - The most authentic colors to use are those which occur most readily in nature. These would be the "earth tones," browns, ochres and tans, plus black (from charcoal or manganese dioxide), white (from clay) and red (from iron oxides). Blues, greens and bright yellows are relatively rare.

Animals - Some desert animals which might be chosen as a moiety totem are: kit fox, hawk, owl, badger, skunk, jackrabbit, tortoise, big horn sheep, rattlesnake, lizard or golden eagle.

Additions to the Basic Module:

Friendly competition between the moieties is part of the theme of the Bone Toss (Module A.3).

Use the moiety symbols and colors when painting or etching designs into the clay storage pot (Module A.1), or when face-painting (Module B.2). The Spirit Bag (Module A.2) can be decorated using moiety symbols.
MODULE B.2: PAINTING OUR FACES FOR THE CAMPFIRE

Theme B: Ceremonial Life

Background

Most Native Americans have some tradition concerning face and body painting and tattooing. Painting is done to prepare the appearance for special events, and because both sexes find the results attractive, similar to the way we use make-up in our culture.

Among the Mohave Indians who live along the Colorado River, both men and women tattooed and painted their faces because they believed that an untattooed person went into a rat's hole at death instead of going to the proper place for spirits (Kroeber 1976:729). Clearly, going into a rat's hole would be a terrible thing to have happen to anyone.

Mohave men do not paint or tattoo themselves as elaborately as the women do, but both mark their faces with lines or rows of dots down the chin and some add a little circle, a stripe or a few spots on the forehead. Mohave women are partial to bright colors such as red or yellow pigment. They paint patterns on their cheeks and draw forking lines downward from the eyes (see diagrams).

This module is meant to be used along with Module B.2, "Acting Out Two Desert Myths". The face-painting lesson can be used to get the class in the mood for listening to and acting out the myths around the campfire.
Materials

*Acrylic paints - (brightly colored, shiny when dry, non-toxic and easily removed from skin by abrasion.)
Clean up with water while wet. Once dry, acrylics are permanent on fabric and other materials, however, so care must be used.
*brushes, short handles
*flat dishes for pallets
*cups for water
*hand-mirrors, to be shared
*"lava" or coarse soap to remove paint from skin

Directions

Gather the class indoors at tables with as many mirrors as are available. Students may wish to pair off and work as teams or apply paint only to themselves. Paint should be kept out of the mouth, the eyes and hair, where it is more difficult to remove when dry. Use moiety colors (see Module B.1)

Modifications to the Basic Module (B.2):

Instead of painting themselves, the class could make masks or headdresses. A simple mask can be made from a paper plate or paper bag, painted and decorated. The lower half of the face might be painted, with the mask worn above.

Mohave Indian Men painted their faces too

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This is the way Mohave Indian women painted their faces

MODULE B.3: ACTING OUT TWO DESERT MYTHS

Theme B: Ceremonial Life

Background

Although the prehistoric desert people did not have books or television, they did have many ways of entertaining themselves. One of their favorite ways of spending a long and cold winter night was to gather around a warm campfire and tell stories. All the stories that were told were history stories which explained parts of the people's past. When stories tell the origins of the people or how things were "in the beginning," we call them myths. People all over the world have myths about their ancestors.

Most cultures also tell fables. These are stories meant to inspire and instruct in right behavior; there is usually a moral to the story. Many fables and folklore tales feature animal characters who act like people. For the desert Indians, Coyote something of a clown and practical joker.

Materials

*a flashlight for the narrator
*a small ball (golf ball?) for Desert Woman (Myth No. 1)
*a basket for the Old Woman (Myth No. 2)

Directions

The group should be around a campfire out in the desert, or all together in a large meeting room with a fireplace. The time must be night, for the scene must be dark. The only illumination must come from the fireplace or campfire. The stories should be read by a narrator (instructor?), with actors acting out the activities of the mythological characters. The Narrator can use a flashlight to read by, if the fire is not sufficient. One moiety should produce Myth No. 1, and other should do Myth No. 2. The class should be seated as an audience.

Supplement

If there is time and imagination left, finish the story of what happens between Coyote and Pretty Bug, or make up a myth about why Mountain Lion has to take orders from Wolf.

Myth No. 1: HOW DESERT WOMAN MADE THE EARTH

Characters: Desert Woman, Coyote, Mountain Lion and Wolf

At the beginning the stage should be empty.

Narrator: At first, in the beginning, there was nothing. In this nothing was an ocean of cold water. This was the water of emptiness. But then, Desert Woman floated by in a basket boat. She was all by herself and she was lonely.

(DESERT WOMAN SHOULD SLOWLY SHUFFLE INTO THE CENTER AREA. SHE SHOULD SPIN AROUND SLOWLY AS ONE WOULD IF THEY WERE DRIFTING. PROP OPTION: MAKING A BOAT.)

Narrator: Then one day, Desert Woman grew tired of being lonely and decided she needed to have some companions. She scratched some skin from her cheek and rolled this flesh into a ball.

(DESERT WOMAN SHOULD SHUFFLE AROUND THE CIRCLE ONE MORE TIME, SPINNING SLOWLY. THEN SHE SHOULD STOP, FACE THE AUDIENCE AND LOOK UP AT THE SKY, AS IF SHE IS THINKING. THEN SHE SHOULD SMILE AND NOD A COUPLE OF TIMES. WITH HER RIGHT HAND SHE SHOULD SCRATCH HER CHEEK A FEW TIMES AND PLACE "FLESHY MATERIALS" INTO HER LEFT HAND. SHE SHOULD THEN ROLL THIS INTO A SMALL BALL (GOLF-BALL SIZED.)

Narrator: Desert Woman worked the small ball into a little larger ball. She held it out before her and inspected it. It was too small so she rolled it until it was larger. She inspected this and again was not satisfied. Desert Woman did this four times until her ball was large enough.

(DESERT WOMAN WILL FORM THE BALL, STOP, HOLD IT OUT BEFORE HERSELF, INSPECT IT, AND SHAKE HER HEAD NO. SHE WILL DO THIS FOUR TIMES BEFORE SHE IS HAPPY WITH IT. THEN SHE WILL NOD HER HEAD IN AGREEMENT.)

Narrator: Desert Woman then tossed the ball out before her and walked to where it had landed. This showed the edges of her world. She decided her world was too small. She was not satisfied. (DESERT WOMAN WILL THROW THE BALL USING A BOWLING-BALL MOTION. SHE THEN WILL WALK TO THE FOUR CORNERS OF HER LITTLE WORLD, NO MORE THAN FOUR OR FIVE STEPS IN ANY DIRECTION. SHE WILL STAND AT THE END OF THE WORLD, HOLD HER HAND SO AS TO SHADE HER EYES, AND PEER OUT
INTO THE DISTANCE. SHE WILL SHAKE HER HEAD SADLY AND FINALLY WALK BACK INTO THE CENTER OF THE CIRCLE AND SIT DOWN.)

**Narrator:** Coyote and Wolf came along. Desert Woman stood and pointed to the edges of her world, showing them how small it was. They understood that she wanted them to help her make the world larger.

(WOLF WILL ENTER. HE IS A PROUD AND STATELY PERSON WHO WILL STAND TALL WITH SHOULDERS BACK. HE WALKS SLOWLY AND PROUDLY. COYOTE WILL FOLLOW. HE IS FOOLISH. HE SHOULD SKIP, SPIN AROUND AND FALL DOWN. THEN HE SHOULD JUMP UP AND JOIN WOLF AND DESERT WOMAN. SHE WILL STAND AND POINT IN EACH OF THE FOUR DIRECTIONS. WOLF AND COYOTE WILL LOOK IN EACH DIRECTION IN WHICH SHE POINTS.)

**Narrator:** Coyote was the first to help. He pulled at the world and slowly made the east and west sides get larger. But this was tiring work. He eventually laid down, curled up like a dog, and went to sleep.

(COYOTE WILL ACT AS IF HE IS PULLING A VERY HEAVY ROPE. HE MUST TRIP AND FALL DOWN AT LEAST TWICE. HE SHOULD PULL AND STAGGER, THEN PULL AND LOSE HOLD OF HIS ROPE AND FALL FORWARD. HE WILL PULL SOME MORE, THEN LIE DOWN, CURL UP AND GO TO SLEEP.)

**Narrator:** Wolf and Desert Woman then went out to inspect what Coyote had done. They walked to the east and then to the west. They found Coyote sound asleep. Desert Woman tried to wake Coyote up, but he fell back asleep.

(WOLF AND DESERT WOMAN WILL WALK SLOWLY, ACTING AS IF THEY ARE INSPECTING THE NEW GROUND WHICH HAS BEEN CREATED BY COYOTE. THEY WILL WALK FIRST AWAY FROM COYOTE AND THEN TOWARDS HIM. THEY WILL STOP BY HIM AND LOOK DOWN. DESERT WOMAN WILL REACH DOWN AND TOUCH HIM. HE WILL SIT UP SLOWLY, SHAKE HIS HEAD, MAKE AS IF TO RISE, THEN TOPPLE OVER AND GO BACK TO SLEEP.)

**Narrator:** Desert Woman then asked Wolf to finish the job which Coyote had started. Wolf agreed but he is very different from Coyote. Wolf summoned Mountain Lion and explained to him what he wanted to have done.

(DESERT WOMAN AND WOLF WILL WALK AWAY FROM COYOTE AND FACE EACH OTHER. DESERT WOMAN WILL POINT IN THE DIRECTION OF NORTH AND THEN SOUTH, AND WOLF WILL SLOWLY NOD HIS HEAD IN AGREEMENT. WOLF WILL TURN, SNAP
HIS FINGERS, AND MOUNTAIN LION WILL WALK TO HIM AND BOW.)

Narrator: Wolf, in his commanding way, directed Mountain Lion in how to stretch the earth. Mountain Lion did as he was directed.

(WOLF WILL POINT TO THE NORTH AND SNAP HIS FINGERS. MOUNTAIN LION WILL RISE FROM HIS BOW, NOD HIS HEAD, AND PULL THE IMAGINARY ROPE, STRETCHING THE EARTH. THEN MOUNTAIN LION WILL RETURN TO WOLF AND BOW LOW AGAIN. WOLF WILL THEN POINT TO THE SOUTH AND SNAP HIS FINGERS. MOUNTAIN LION WILL PULL THE EARTH IN THAT DIRECTION. WHEN FINISHED, HE WILL RETURN TO WOLF AND KNEEL.)

Narrator: Wolf then turned to Desert Woman and allowed her to inspect his work. She was much pleased. Her world had now been created.

(WOLF WILL SNAP HIS FINGERS. MOUNTAIN LION WILL RISE AND BACK AWAY FROM HIM, LEAVING THE ACTING AREA. WOLF WILL THEN TURN TO DESERT WOMAN AND HOLD OUT HIS ARMS TO SHOW HER HIS WORK. SHE WILL LOOK IN BOTH DIRECTIONS AND SMILE AND NOD HER HEAD IN HAPPINESS. COYOTE WILL JUMP UP, SEE THAT THE WORLD HAS BEEN ENLARGED, AND RUN AROUND THE OUTSKIRTS OF THE WORLD FLAPPING HIS ARMS. THEN HE WILL EXIT.)

Narrator: And that is how the desert people believed their part of the world was created.

End of Myth No. 1

Myth No. 2: HOW THE PEOPLE WERE MADE

Characters: Coyote, Pretty Bug, Old Woman, Deer, Big Horn Sheep, Rabbit

At the start of the story, Pretty Bug should be off stage in the dark. So should Old Woman, Deer, Big Horn Sheep and Rabbit. Coyote should stand as close to the fire as possible.

Narrator: In the time when animals were people, the earth was a very lonely place. Coyote lived in a cave by himself and had little to do except walk around and watch the sky.

(COYOTE SHOULD WALK ABOUT LOOKING UP AT THE SKY. SINCE COYOTE IS KIND OF A SILLY CREATURE, IT'S ALRIGHT FOR HIM TO BE A HAM.)
Narrator: Then one day he looked down and saw footprints in the sand.

(COYOTE SHOULD LOOK DOWN AND STUDY THE SAND AND THEN GET EXCITED AND JUMP ABOUT.)

Narrator: Coyote began to follow the footprints, hoping to find the person who made them.

(COYOTE SHOULD SLOWLY WALK, ALWAYS LOOKING DOWN, OUT INTO THE DARKNESS. HE IS NOW OUT OF THE PICTURE.)

Narrator: Along came Pretty Bug. She was walking slowly, looking for food to eat.

(PRETTY BUG SHOULD WALK OUT OF THE DARKNESS, LOOKING RIGHT AND LEFT, AS IF SHE’S HUNTING FOR PLANTS TO EAT.)

Narrator: Coyote followed Pretty Bug’s tracks and soon found her. He was very excited. His tongue hung out of his mouth.

(PRETTY BUG SHOULD BE LOOKING INTO THE FIRE. COYOTE SLOWLY COMES UP BEHIND HER, LOOKING AT HER FOOTPRINTS. HE SEES HER AND JUMPS UP AND DOWN AND LETS HIS TONGUE HANG OUT. REMEMBER, HE’S A SILLY FOOL.)

Narrator: Coyote was immediately taken by Pretty Bug’s beauty and asked her to marry him.

(COYOTE GETS DOWN ON HIS KNEES AND PLEADS HIS CASE. FINALLY, PRETTY BUG WILL SMILE AND NOD HER HEAD YES.)

Narrator: But Pretty Bug wanted to play a trick on Coyote. She told him to go on ahead and build her a campfire. She would soon follow him.

(COYOTE RUNS ALL THE WAY AROUND THE ROOM OR CAMPFIRE AND THEN ACTS AS IF HE IS BUILDING A FIRE. THEN HE SITS DOWN BESIDE IT AND WARMS HIS HANDS.)

Narrator: Pretty Bug quietly came up behind Coyote and cast a spell upon him, making him fall asleep. Pretty Bug then left.

(PRETTY BUG SNEAKS UP BEHIND HIM AND WAVES HER HANDS AT COYOTE. HE STAGGERS AND COLLAPSES, FALLING DOWN ASLEEP. PRETTY BUG THEN WALKS OFF, OVER BY THE FIRE.)

Narrator: When Coyote woke up, he saw Pretty Bug was not there. He jumped up and followed her tracks until he found her again.
(COYOTE SHOULD WAKE UP, LOOK ABOUT IN SURPRISE, JUMP UP AND RUN AROUND IN CIRCLES LOOKING FOR PRETTY BUG. THEN HE SHOULD LOOK DOWN FOR HER TRACKS AND EVENTUALLY FIND HER.)

Narrator: Pretty Bug smiled at Coyote and he forgot she had tricked him. then, she asked him to run on ahead and build a fire. She told him she would follow in just a little while. Coyote, gullible as ever, believed her and ran on ahead and built a fire.

(PRETTY BUG SHOULD WAVE HER FINGER AT COYOTE AND HE SHOULD NOD QUICKLY AT WHAT SHE IS SAYING. THEN HE SHOULD RUN AROUND THE FIRE AND PRETEND TO BUILD A CAMPFIRE. HE SHOULD SIT DOWN BY THE FIRE AND WARM HIS HANDS.)

Narrator: But Pretty Bug was not finished with him. Again, she came up to him and cast a spell upon him, putting him to sleep. While he lay sleeping she walked on past.

(PRETTY BUG SHOULD SNEAK UP BEHIND COYOTE AND WAVE HER HANDS AT HIM. HE THEN WILL ROCK BACK AND FORTH AND THEN FALL DOWN ASLEEP. PRETTY BUG WILL THEN WALK ON PAST AND GO TO THE FIRE.)

Narrator: When Coyote awoke he was amazed to find he had fallen asleep. He looked about and saw Pretty Bug was not there. Poor Coyote jumped up and searched the area but could not find her. Instead, he ran into Old Woman. Old Woman shuffled along slowly, holding a basket.

(COYOTE WAKES UP AND ACTS SURPRISED TO FIND HIMSELF ALONE. HE JUMPS UP AND RUNS ABOUT, LOOKING FOR PRETTY BUG. AFTER DOING THIS FOR A WHILE, OLD WOMAN SHOULD SLOWLY SHUFFLE ONTO THE SCENE. SHE SHOULD BE HUNCHED OVER AND ACTING AS IF SHE IS CARRYING A HEAVY BASKET.)

Narrator: Coyote went up to Old Woman and asked her if she knew where Pretty Bug was. Old Woman didn't know, but she asked him for his help. Would he carry her heavy basket for a while? She then could help him find Pretty Bug. Coyote took the basket.

(COYOTE GOES UP TO OLD WOMAN AND, USING HIS HANDS, DESCRIBES PRETTY BUG. AFTER WATCHING HIM MOTION FOR A WHILE, OLD WOMAN WILL SHAKE HER HEAD NO. SHE THEN WILL HOLD UP HER HAND AS IF TO GIVE HIM THE BASKET. AT FIRST COYOTE WILL NOT WANT TO TAKE IT, BUT SHE WILL CONTINUE TO HOLD OUT HER HAND UNTIL HE TAKES THE BASKET.)
Narrator: When Coyote started to look into the basket, Old Woman scolded him and told him never to open the basket, or else what's inside would get out. He agreed not to open it. Old Woman then shuffled off, looking for Pretty Bug. Coyote walked away, but he was attracted to what was inside the basket.

(COYOTE LOOKS DOWN AT THE BASKET AND HOLDS IT UP TOWARDS HIS FACE. OLD WOMAN WILL RUSH AT HIM AND SHAKE HER HAND AND POINT HER FINGER. HE WILL JUMP BACK A LITTLE, PUT HIS HANDS DOWN, DROP HIS SHOULDERS, AND TURN HIS HEAD AWAY FROM HER. HE WILL LOOK BACK AT OLD WOMAN AND NOD HIS HEAD YES. THEN COYOTE WILL WALK OVER TO WHERE DEER, BIG HORN SHEEP AND RABBIT ARE SITTING. HE WILL LOOK LONGINGLY AT THE BASKET.)

Narrator: Poor Coyote couldn't keep from wanting to look inside the basket. Finally, he had to. He pulled the cover off and looked in. To his horror, the basket was filled with animal-people. They knocked him down and jumped out, one at a time. As each animal person ran away, it announced its name: "I am Deer!" and "I am Big Horn Sheep!" and "I am Rabbit!"

(COYOTE LOOKS DOWN AT THE BASKET HE IS HOLDING OVER THE HEADS OF DEER, BIG HORN SHEEP AND RABBIT. USING HIS OTHER HAND, COYOTE WILL PRETEND TO LIFT THE COVER. ALL THREE ANIMALS WILL INSTANTLY WAVE THEIR HANDS IN THE AIR. COYOTE WILL FALL BACKWARDS. DEER WILL JUMP UP, SHOUT "I AM DEER!" THEN RUN OFF. THEN BIG HORN SHEEP WILL JUMP UP AND SHOUT HIS/HER NAME. THIS PERSON WILL ALSO RUN OFF. FINALLY RABBIT WILL DO THE SAME. ONLY COYOTE WILL BE LEFT, LYING ON THE GROUND.)

Narrator: And that is the story of how the earth was filled with animal-people. Coyote, because he was so foolish, never did find Pretty Bug. And because he did not listen to Old Woman, she was angry with him and did not help him find Pretty Bug.

End of Myth No. 2
MODULE C.1: THE DESERT CROSSING
(Taking a Special Hike)

Theme C: Harmony With the Natural World

Background

The hunters-and-gatherers who lived in the desert had to travel around often in search of good food and water. It was their way of life; there was generally not enough food to stay at one place all year round and different foods became available in season for short times in widely scattered places.

The Chemehuevis lived most of the time in small family bands and came together with the whole tribe once or twice a year for big celebrations, such as the annual rabbit drive. They worked together to catch enough food for everyone to eat. They made noise and beat the brush, which drove the rabbits into big nets where they were caught. When the people made a good catch, they would have a big feast with much dancing, singing, game-playing, and socializing. The ancient Hawaiian people drove fish into nets and feasted in the same way.

The desert people had regular routes they would follow from spring to spring to find water. They knew, maybe even better than we do, that water is the most precious resource in the desert. The people came to the springs to drink and bathe and to collect special foods, depending on the season. They knew when certain plants would be ripe and when the best time to harvest was.

One plant the people used a lot was the mesquite bean. At the Desert Studies Center, there are both kinds of mesquite trees, the Honey Bean mesquite and Screw Bean mesquite. Both trees make edible seeds at opposite times of the year, so there was almost always food here. Even coyotes will eat mesquite beans. Watch out for the thorns when you look at the mesquite trees.

This module is intended to give students the experience of walking out in nature and observing it as the desert people did. The group will be driven out onto Zzyzx Road, either north or south, and will walk back in to the Center, so that they always have the image of the oasis before them as they walk along. They will be able to appreciate the shade and greenery of the oasis compared to the dry salty surface of Soda Lake.

Important note: collection of plants, animals or artifacts (historic or prehistoric) is strictly prohibited at the Desert Studies Center and environs. Like a park, this place is a natural preserve to be appreciated and not disturbed more than necessary. The Center is an excellent place to teach students about the non-destructive enjoyment of nature.
Materials

*Canteens - each student should carry his/her own water
*hat
*sunglasses

This module does not require materials in the usual sense. The most important consideration is that the students must be prepared to walk in the bright sun for a mile or two (depending on the age group). It takes about 45 minutes for the average class to walk 1 mile.

Directions

Choose one of the routes outlined below. Transport the class about one to two miles up or down Zzyzx Road. Gather class before hiking to explain the hike. This module is intended to recreate a short journey by desert people. Ask the question: How can we tell where water is?

Before setting off on the hike back to the Center, walk out onto Soda Lake playa (if the lake surface is not too soft). You will have an extraordinary view of the Center and the desert for about twenty miles around. The close mountains on the east side of Soda Lake are the Cowhole Mountains, about nine miles away. The tallest peak is called "Flat-top" by the people who live in the area. Ask the questions: What is affecting you? What do you feel, see, smell?

ROUTE ONE:

Drive NORTH along Zzyzx Road toward I-15. Walk students out onto the playas, then turn south to walk toward the Center buildings. Walking on the "crunchy" playa salts will generally be an unusual experience for the class. Avoid soft or wet areas.

The line of dirt you see leading off toward Baker is what remains of the Tonopah and Tidewater Railroad berm. From 1906 to 1940, a railroad train ran on this raised track once a day. Close to the Center, the berm has been widened to make it usable as an airplane landing strip. Watch for possible muddy walking conditions when coming close to the ponds. The birds on the water and nesting in the reeds are American Mud Hens, also called Coots.

There is a panel of petroglyphs, rock art made by prehistoric people, on the south side of point of land just off Zzyzx Road boulder which faces up and a little east. The boulder is a very short climb up the slope. There are planted palm trees nearby. In addition to the panel, there are scattered petroglyphs in the immediate vicinity, closer to the road.

(For more information on local history, plants, animals, etc., contact the Desert Studies staff.)
ROUTE TWO:

Drive SOUTH on Zzyzx Road past the caretakers' home and other buildings down at least as far as the tamarisk trees. The trees are on the west side of the road, sheltering some concrete block structures. Drop the class off here. Questions: What do we know about the place because of the trees? (There is underground water and a well here.) Show students the old stalls and see if they can guess what animals were raised here (sometime in the 1960s a man raised goats in these buildings).

There is another cluster of structures to walk to about 50 yards south of the Goat Farm. These buildings are partly below the ground and were also used to raise animals (rabbits!). The idea was that the temperature would be cooler below ground. The class should at least explore this area before heading back to the Center.

Supplement to Route Two

When returning from the Goat Farm, instead of walking on the raised road, turn east at the southern end of Limestone Hill. Pick up the path which goes around the front of the hill. There are cement foundations at the south end which were footings for a ten-stamp silver mill dating from around the turn of the century. The ore was crushed in the mill before being shipped for refining. Also visible on the south are the remains of salt evaporation ponds.

The trail leads around the east side of Limestone Hill, passing several open ponds of water. The endangered Mohave Tui Chub, small minnow-like fish, live in these ponds. Continuing north, you will pass a rock shelter, which is a shallow cave where prehistoric people once lived as much as 2,000 years ago. More information on these sites is available from the Desert Studies staff.

Alternative:

Make the hike to the old goat farm and rabbit rooms at night. The buildings are a bit "spooky" in the dark. However, if you do so keep alert for reptiles which are sometimes about during the night.
Map of the Desert Studies Center

PLAN OF SODA SPRINGS
MOJAVE DESERT, CALIFORNIA
MODULE C.2: MARKING THE SUN'S JOURNEY ACROSS THE SKY (Building a Gnomon)

Theme C: Harmony with the Natural World

Background

Archaeologists and astronomers working together have discovered that the prehistoric people of the Southwest were very concerned about marking the seasons and the directions of the compass. The people were very much aware of the forces of nature and wanted to know where they stood in relation to them.

The Chemehuevi placed special meaning on north and east, and thought of them as two pairs. The east-west pair was the sacred or ceremonial set of directions. When a person was sick, their bodies were always placed with the head towards the west. When performing a ritual dance, the shaman danced first to the east, and then to the west, and then repeated his directions.

The Pima Indians of Arizona also placed special value in the directions. As do many other people around the world, they felt it was important to have the entrances of their houses facing east. The Pima also had stories about mythological beings who lived in each direction.

Though most of these people were aware of the north star, there were other ways to determine true north known to prehistoric desert dwellers. One of these ways was to construct what we call a gnomon. A gnomon is basically just a stick in the ground which casts a shadow on a flat piece of ground.

The shaman built a gnomon by observing the shadow throughout the course of one day. This was part of a larger ceremony in which the different parts of the day were recognized and tribute was paid to them. Today, we meticulously divide the parts of our time into hours, minutes, seconds, and fractions of seconds. This is because our culture places so much stress on measurement.

For the early people, measurement of time was not nearly as important as keeping track of the yearly calendar. They needed to record the events which went with a particular part of the day or season for ritual reasons. They wanted to know in which direction to look for the rising sun.

A gnomon was built by smoothing a flat area and covering the surface with a thin layer of soft sand. Then, a straight stick was stuck into the ground vertically, in the center of the smoothed area. The stick usually was two to three feet in length, and was painted with the markings of the family or clan in charge of the gnomon.

After the sun had risen above the horizon, the ceremonies began in the form of chanting and dancing. At
the end of each round of songs and dances, the shaman would place a special painted marker stone at the exact end of the shadow produced by the vertical stick. As the sun moved across the sky, the shadow would move, and the marker stones would create an ellipse across the smoothed sand (see diagram). If the sky was overcast and no shadow could be seen, this was a bad omen.

The shadow-marking ceremony would end in late afternoon, after which the people would have a feast. The shaman would loosely attach a woven string to the vertical stick. The string would be moved around the stick in a half-circle. The arc created would intersect the line of painted stones marking the shadow in only two places. A line drawn between these two points determined the east-west direction. A line drawn perpendicular to the line just drawn, away from the vertical stick, would give the north-south direction.

Materials

*a sturdy stick, (a broom handle?, a metal rod?) 3-4 feet tall
*a heavy hammer to pound in the stick
*painted rocks to mark the shadow
*string with a small stick or pencil at one end a straight edge to draw the lines
*sunshine

Directions

Choose a flat, open area at least ten feet in diameter which will be in the sun most of the day. Smooth the ground surface by removing any rocks, branches or tracks. Pound the gnomon pole into the ground in the center of the cleared area. Place a thin covering of clean dune or river sand over the entire area.

About every hour, have a student place a small painted stone (walnut-sized) at the exact end of the shadow produced by the stick. (This might be a job assigned to students unable to take the Desert Crossing hike.) Depending on the time of year, the shape made by the stones should be a gentle curve.

If the sun will set behind tall mountains (as at the Desert Studies Center), do not start marking the shadow until there is an even amount of time on either side of noon. For example, if the sun goes behind the mountains at 3:00 p.m., do not start recording the shadow before 9:00 a.m. This is so that there will be three hours before and three hours after noon for shadow-casting.

When the shadow is gone, attach the string to the gnomon pole and draw the half-circle so that it intersects the shadow line in two places. Draw a straight line in the soft sand between these two points for east/west. Draw another line at right angles to this first line to indicate north and south.

After dinner and the acting out of the myths, the class should return to the gnomon site in the dark to observe the night sky. Using the front two stars of the ladle of the Big Dipper, find Polaris, the pole star, which indicates north. Check the gnomon line for accuracy against the stars.
Using a Gnomon to Determine the Directions