Blackfeet Skies

An educational guide based on the star lore of the Blackfeet Indians of Montanna

Developed by Gregory Vogt, Ed.D.

in cooperation with the Blackfeet Native Science Field Center

and

Hopa Mountain
2009
Acknowledgments

Who should be included here?

Reviewer List

Bob Yaw

Hopa Mountain people

Blackfeet Native Science Field Center people

Ann Grant - Cover Design

Others?
**Table of contents**  *(PAGE NUMBERS TO BE ADDED IN FINAL DRAFT)*

- Introduction - “Blackfeet Skies” ....................................................... 00
- How to Use This Guide ................................................................. 00
- Essential Understanding Regarding Montana Indians ...................... 00
- Blackfeet Skies and the Montana Standards for Science .................. 00
- Blackfeet Skies online Digital Teachers Workshop .......................... 00
- Telling Time .................................................................................. 00
- Star Sign ...................................................................................... 00
- Many Moons. ............................................................................... 00
- Moon Face ................................................................................... 00
- Moon Trail . ............................................................................... 00
- Morning Star. ............................................................................. 00
- Seven Brothers .......................................................................... 00
- Sky Beings .................................................................................. 00
- Appendix - Blackfeet Star Stories .................................................. 00
- Additional Resources .................................................................... 00
Flakes of snow swirl through the encampment as gusting winds from the jagged divide sweep eastward across undulating plains. It is the last breath of the day. The brittle frozen tops of bunch grass bend and crack. Cottonwood leaves clatter and fall to the frozen creek. Steaming horses snort and stamp. Dogs bark. The People begin settling in. Overhead, the sky is tinted by the failing sun in red and blue and violet. Night is coming.

One by one, tipis glow as their fires are stoked. Bright stars peak out. The night sky is awakening.

Snuggled in red buffalo robes, children sit around a fire and watch as smoke swirls upward and escapes through the hole to the sky. A star peaks through the poles.

An old man, like a gemstone in a ring, completes the circle. His eyes sparkle and his face glows in the firelight. He looks each child in the eye. They are quiet.

It is time for stories. From his heart flows the history and beliefs of the Blackfeet tribe. He tells of long ago when the world came to be. His stories begin and end with the sky for that is from where the Blackfeet came.

The Blackfeet have always been explorers and sophisticated observers of the world. During the buffalo days, they moved between summer and winter camps, and went on raids as far south as Mexico. They knew their way because the stars and the Sun and the Moon were their guides. They knew directions, knew the seasons, knew which stars moved and which barely moved at all, and knew when and where to look for the rising of important stars. Blackfeet sky lore is both ancient and modern.

The Blackfeet people are astronomers. The sky serves many purposes. The stars and the Sun, Moon, Venus, and Jupiter are chief characters in many great stories. These stories preserve and pass on Blackfeet beliefs, wisdom, and morality from one generation to the next.

Blackfeet skies are wonderfully clear. To the naked eye, thousands of stars twinkle with rising and falling air currents and hold their brilliance from horizon to horizon. The Moon grows fuller and thinner in a 29-day cycle. When full, it illuminates the rolling country. Slow and subtle, the planets dance against the background of stars. The coming of the seasons is announced by the changing positions of the rising and setting sun. Meteors streak across the sky and ghostly comets appear and fade away.

Blackfeet Skies
Though much about Blackfeet life has changed from the buffalo days, including a night sky that has diminished somewhat by the effects of pollution and electric lights, some of the ancient stories of the stars have survived. These stories enrich and strengthen Blackfeet culture and heritage. Today’s Blackfeet children are fortunate because the traditional stories of their relationship with the sky can be paired with the knowledge of today. Telescopes, space probes, computers, and manned spacecraft have compressed the great expanse of space so that we can see back to the beginning of time.

Blackfeet star lore is a living body of knowledge and wisdom. Here are just a few things that have been added since the buffalo days.

- The morning stars are not stars but planets - complete worlds unto their own and part of a complex system orbiting the Sun.
- The Moon is but one of more than 100 moons that inhabit the solar system.
- The Sun is not a flaming brand but a huge mass of glowing gas heated in its center to 15 million degrees Fahrenheit by its nuclear furnace.
- The Moon gives off no light of its own and its surface looks like Earth would look had we not had an atmosphere.
- Falling stars are bits of space rock, left over from the formation of the solar system, that become superheated as they fall through the atmosphere.
- Faint, smoky patches are distant clouds of gas and debris, often trillions of miles wide, that are the birthplace of new stars or the graveyards of exploded stars.
- The Milky Way is the edge of our spiral galaxy and contains perhaps 200 billion stars.
- The Milky Way is just one of billions of galaxies.
Essential Understandings Regarding Montana Indians

In 2008, the Montana Office of Public Instruction adopted a set of seven essential understandings relating to the people of the 12 tribal nations of Montana. This set provides the foundation for Indian Education for All in the state of Montana. It is a recognition of the rich diversity and contributions of the Native American population to the state in its past and present and for its hopes for the future.

These statements help in recognizing and appreciating the bridge that links Blackfeet myth and spirituality to modern day science and exploration.

The full document with detailed explanations of each of the seven essential understandings is found at the following MOPI site:


Of special interest and relevance to this guide are the following four Essential Understandings Regarding Montana Indians:

**Essential Understanding 1**

*There is great diversity among the 12 tribal Nations of Montana in their languages, cultures, histories and governments. Each Nation has a distinct and unique cultural heritage that contributes to modern Montana.*

**Essential Understanding 2**

*There is great diversity among individual American Indians as identity is developed, defined and redefined by entities, organizations and people. A continuum of Indian identity, unique to each individual, ranges from assimilated to traditional. There is no generic American Indian.*

**Essential Understanding 3**

*The ideologies of Native traditional beliefs and spirituality persist into modern day life as tribal cultures, traditions, and languages are still practiced by many American Indian people and are incorporated into how tribes govern and manage their affairs. Additionally, each tribe has its own oral histories, which are as valid as written histories. These histories pre-date the “discovery” of North America.*

**Essential Understanding 6**

*History is a story most often related through the subjective experience of the teller. With the inclusion of more and varied voices, histories are being rediscovered and revised. History told from an Indian perspective frequently conflicts with the stories mainstream historians tell.*
Blackfeet Skies and the Montana Standards for Science

While the content and activities contained in this educational guide address many content standards, they most clearly address the following standards and benchmarks from the Montana K-12 Science Content Standards and Performance Descriptors - Office of Public Instruction, November 2006.

**Content Standard 4**—Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interactions of Earth’s systems and other objects in space.

**Benchmarks - Students will:**

<table>
<thead>
<tr>
<th>End of Grade 4</th>
<th>End of Grade 8</th>
<th>Upon Graduation End of Grade 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. identify objects (e.g., moon, stars, meteors) in the sky and their patterns of movement and explain that light and heat comes from a star called the sun</td>
<td>6. describe the earth, moon, planets and other objects in space in terms of size, force of gravity, structure, and movement in relation to the sun</td>
<td>6. describe the origin, location, and evolution of stars and their planetary systems in respect to the solar system, the milky way, the local galactic group, and the universe</td>
</tr>
<tr>
<td>7. identify technology and methods used for space exploration (e.g. star parties, space shuttles, telescopes)</td>
<td>7. identify scientific theories about the origin and evolution of the earth and solar system</td>
<td>7. relate how evidence from advanced technology applied to scientific investigations (e.g., large telescopes and spaceborne observatories), has dramatically impacted our understanding of the origin, size, and evolution of the universe</td>
</tr>
</tbody>
</table>

**Content Standard 5**—Students, through the inquiry process, understand how scientific knowledge and technological developments impact communities, cultures and societies.

**Benchmarks - Students will:**

<table>
<thead>
<tr>
<th>End of Grade 4</th>
<th>End of Grade 8</th>
<th>Upon Graduation End of Grade 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. identify how the knowledge of science and technology influences the development of the Montana American Indian cultures</td>
<td>5. describe how the knowledge of science and technology influences the development of the Montana American Indian</td>
<td>5. explain how the knowledge of science and technology applies to contemporary Montana American Indian communities (e.g., natural resources development, management and conservation)</td>
</tr>
</tbody>
</table>
**Content Standard 6**—Students understand historical developments in science and technology.

**Benchmarks - Students will:**

<table>
<thead>
<tr>
<th>End of Grade 4</th>
<th>End of Grade 8</th>
<th>Upon Graduation End of Grade 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. give historical examples of scientific and technological contributions to communities, cultures and societies, including Montana American Indian examples</td>
<td>1. give examples of scientific discoveries and describe the interrelationship between technological advances and scientific understanding, including Montana American Indian examples</td>
<td>1. analyze and illustrate the historical impact of scientific and technological advances, including Montana American Indian examples</td>
</tr>
<tr>
<td>2. describe how scientific inquiry has produced much knowledge about the world and a variety of contributions toward understanding events and phenomenon within the universe</td>
<td>2. identify major milestones in science that have impacted science, technology, and society</td>
<td>2. trace developments that demonstrate scientific knowledge is subject to change as new evidence becomes available</td>
</tr>
<tr>
<td>3. describe science as a human endeavor and an ongoing process</td>
<td>3. describe and explain science as a human endeavor and an ongoing process</td>
<td>3. describe, explain, and analyze science as a human endeavor and an ongoing process</td>
</tr>
</tbody>
</table>
How to Use This Guide

The purpose of the *Blackfeet Skies Educator Guide* is to merge the Blackfeet star lore of past with the star lore of the present. The guide contains a collection of activities, inspired by Blackfeet star lore, that are suitable for helping students learn fundamental astronomy concepts. They seek to explain some of the astronomical phenomena that captured the attention of the Old Ones and show their relevance to today. Stars, lunar phases, and planetary movements are just as exciting to today’s Blackfeet astronomers (your students) as they were to the Old Ones.

Each activity has components that are appropriate for use in the Starlab Planetarium and or in the classroom. For the most part, the activities are focused at the middle school level but they can be adjusted up or down in academic level as needed. Whenever possible, the activities should be approached as cooperative learning with students organized into small research teams.

<table>
<thead>
<tr>
<th>Activity Components</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title:</strong> Banner with an astronomical tipi art symbol</td>
</tr>
<tr>
<td><strong>Description:</strong> Brief explanation of the subject of the activity.</td>
</tr>
<tr>
<td><strong>Concept:</strong> The main idea of the activity.</td>
</tr>
<tr>
<td><strong>Estimated Time:</strong> Approximate amount of class time needed for the activity.</td>
</tr>
<tr>
<td><strong>Montana Content Standards:</strong> Standards related to the activity content and skills.</td>
</tr>
<tr>
<td><strong>Materials and Tools:</strong> Summary of what is needed per student, group, or class.</td>
</tr>
<tr>
<td><strong>Blackfeet Star Stories:</strong> Star stories in the Appendix related to the activity.</td>
</tr>
<tr>
<td><strong>Star Lore:</strong> Background information and illustrations on the activity topic to make educators content expert.</td>
</tr>
<tr>
<td><strong>Star Fact:</strong> Tidbit of supportive information.</td>
</tr>
<tr>
<td><strong>Yellow Box:</strong> A short statement of the central idea of the activity.</td>
</tr>
<tr>
<td><strong>Starlab Demonstration:</strong> The component of the activity suitable for use in the Starlab Planetarium.</td>
</tr>
<tr>
<td><strong>Activity:</strong> Instructions on setting up and conducting the activity.</td>
</tr>
<tr>
<td><strong>Assessment and Questions for Discussion:</strong> Assessment and discussion ideas.</td>
</tr>
<tr>
<td><strong>Extensions:</strong> Ideas for additional activities and student projects.</td>
</tr>
<tr>
<td><strong>Resources:</strong> Internet sites and publications that provide additional information.</td>
</tr>
</tbody>
</table>
One of the finest resources available for Blackfeet star lore is the digital teacher workshop led by Leo Bird, a high school teacher in Browning Montana and an expert in astronomy education especially from the Native American perspective. The workshop, consisting of six chapters or lessons, helps teachers understand the role of star lore in the Blackfeet culture in the past, the present, and the future.

Sponsored by the US Department of Education and the Office of Indian Education, Digital Teacher Workshops are designed to provide professional development training for Teachers of American Indians and Alaska Natives in all grade levels and content areas. The workshops support mastery of academic content and application by modeling strong teaching methods that have been successful in the classroom and providing a classroom application component, and additional resources.

These workshops were produced by the Teacher-to-Teacher Initiative in collaboration with Office of Indian Education. Native teachers from around the country present strategies for teachers in various subject areas. The featured teachers combine research based knowledge with content knowledge to increase AI/AN student academic achievement.

Leo Bird’s teacher workshop and the workshops presented by the other master teachers in the series are available online at the following address:

http://www.t2tweb.us/nativeamerican/Home.asp
Telling Time

DESCRIPTION
Students construct star clocks for estimating the time by observing the current position of the *li Ki tsika Miks* or Seven Brothers (Big Dipper) constellation in relation to the day of the month.

CONCEPT
Earth’s rotation causes stars to appear to move across the sky. The position of the stars at any moment can be used to estimate clock time if the calendar date is known.

ESTIMATED TIME
30 minutes to construct the star clocks.
30 minutes to learn how to use them.

MATERIALS AND TOOLS
(per student)
Star Clock Patterns
Small brass paper fasteners
Scissors
Crayons or markers
(per class)
Board
Nail
Small hammer

Blackfeet Star Stories
Seven Brothers
Fixed Star

Star Lore
Go out into the Montana nighttime sky and pick out a grouping of bright stars in the south. Remember where they are. Wait an hour or two and look for your stars again. They will have moved westward. Check later and your stars will be further to the west. If you draw a sky map to show the position of your stars each time you observe them, you will note they move on broad curved paths stretching from the eastern prairie to the western mountains.

If you look towards the north, star movements paint a different picture. Northern stars move in paths that form concentric circles. These stars, never rising and never setting, are called the circumpolar stars. If you draw a map of the movements of the northern stars, you will note that one star’s movement is so slight it appears not to move at all. In the Blackfeet tradition, this is the Fixed Star or Little Brother. It is the turnip hole linking Earth to the land of the Sun (Natosi) and Moon (Kokomikiison) in the story “Fixed Star.” To others it is called “Polaris,” the “North Star, or Alpha Ursa Minoris.

Moving stars is something that has been known since ancient times. The Blackfeet of old were well aware of these movements. They observed the southern stars rise in the east and set in the west and watched the northern stars circle about the Fixed Star. Like all peoples of the time, the Old Ones believed the entire sky, except for the Fixed Star, was moving. It was a logical conclusion based on observation.

The invention of the telescope and precise instruments for measuring positions and distance, have enabled modern Blackfeet observers the opportunity to see a different picture of sky movements. The new picture is based on the realization of Earth’s true nature. Rather than being a fixed flat surface punctuated with mountains and sliced by rivers, Earth is a rotating spherical world. It spins or rotates around an imaginary line or axis. The

Star Fact
Earth’s rotation produces an eastward surface speed that is related to your latitude. The surface speed of the land on the Blackfeet reservation is approximately 683 miles per hour. At the equator, the speed is 1,040 miles per hour. At the North Pole, the speed is 0 miles per hour.
points where the ends of the axis emerge from Earth’s surface are called the North and South Poles. The rotation is so smooth, we are unaware it. Consequently, Earth’s rotation creates the illusion of moving stars (also the Sun and Moon). The illusion is similar to the illusion of rolling plains whooshing past a rider on a fast pony.

Like the axis of a spinning top, the alignment of Earth’s axis remains fairly constant. By chance, its north end points almost directly at a bright star - the Fixed Star. If you could stand on the North Pole, the Fixed Star would be nearly directly overhead. All other stars would appear to circle about it. From the Blackfeet Reservation in Montana, the Fixed Star lies about 49 degrees above the north horizon. The circumpolar stars are those that are no further than 49 degrees from the Fixed Star. Head south from the reservation and the Fixed Star will drop lower in the sky and there will be fewer circumpolar stars. Go to the equator and the Fixed Star will lie directly on the north horizon. All stars rise in the east and set in the west (none are circumpolar).

The movements of stars in the night sky may be confusing to students. Regardless of the explanation, the stars look like they are moving. Patterns of stars appear to move together as though they are physically connected. In reality, stars are scattered throughout space and move in relation to one another. However, star distances from Earth are so great individual movements appear infinitesimal even over hundreds or thousands of years. Compare the apparent speed of a low-flying airplane passing directly overhead to the apparent speed of a jet plane crossing the Montana sky seven miles overhead. While the high plane is actually traveling faster than the low plane, its greater distance makes it appear to slowly crawl across the sky. For this reason, the Blackfeet sky of today still looks like the Blackfeet sky of hundreds of years ago.

**Starlab Demonstration:**
The Starlab planetarium can help students understand apparent star movements. Moving the star field projector can compress hours of apparent real time star movement to just seconds. The rising and setting of southern stars is easily observed as well as the movement of the circumpolar stars. Start with the star projector tilted to approximately 49 degrees to match the central latitude of the Blackfeet Reservation. Rotate the star field and observe the apparent movements of the southern stars (rising in the east, arcing across the sky, and setting in the west). Also observe the northern stars circling about the Fixed Star. Next, change the latitude and take your students to the North Pole. The star projector should be aimed straight upward. Turn the star field and your students will observe that all stars except the Fixed Star (directly overhead) are circumpolar. Finally tilt the projector so that the Fixed Star is on the north horizon. There, all stars rise and set.

Once students grasp the concept that sky movements are the result of Earth rotation, it is easy to understand that stars, like the hands of a clock, can be used to estimate the passage of time.
Activity: Making A Star Clock
1. Copy the Star Clock masters on heavyweight paper. Give one back wheel and one front wheel to each student. Also provide scissors and one small brass paper fastener to each.
2. Have students carefully cut out the two clock wheels. (Optional: Color the rim of the outer circle of the back wheel. The pattern is adapted from traditional tipi art showing rounded hills on the horizon and “dusty stars” (falling stars).
3. Set up a punching station with a board, nail, and a small hammer. When ready, students, will place the their clock wheels, one at a time on the wood, and punch a small hole in the center of each wheel. They should lightly tap the nail to punch the holes. One hole goes in the center of the + on the back wheel and the other hole exactly through the Fixed Star on the front wheel.
4. The points of the brass paper fastener should be pressed through the Fixed Star hole and then through the hole in the back wheel. Then, the points should be spread open to keep the two wheels together. Careful turning of the front wheel will enlarge the hole slightly so that it will turn freely. The star clock is ready for use.

Using the Star Clock
1. Take your students and their clocks inside the Starlab planetarium. Have your students sit in the “south” side of the planetarium as determined by where the north star projects in the sky.
2. Show your students how to locate the Seven Brothers (Big Dipper) constellation in the northern sky. Also show them how to use the pointer stars to find the north star. (The pointer stars are the two “cup” stars shown on the clock face. The extension of a line connecting these two stars leads to the Fixed Star.
3. Rotate the sky field to show how the pointer stars always point toward the Fixed Star.
4. Bring up the dome lights slightly so that your students can see their star clocks while still observing the stars.
5. Ask your students for the calendar date. Tell them to find that date on the outside wheel of the clock. If the date is March 13, for example, the date will be between March 10 and March 15. Have them pinch that spot between their thumb and index finger on one hand. They should hold the clock so the calendar date it to the top.
6. Tell students to rotate the inner wheel of the clock with their other hand so that the Seven Brothers constellation is tilted the same way the constellation is tilted in the Starlab sky.
7. Once the outer and inner wheels are properly aligned, the star clock time is read by the position of the arrowhead coming from the end of the Seven Brothers (dipper handle).
8. After all students come up with the same time (+- 30 minutes) rotate the sky field again and tell your students it is later at night. What time is it?
9. Practice telling the time a few more times until all students are comfortable with their clocks. Send them home and ask them to go out at night and tell the time with the stars.
Tips
• If any students are having trouble working their clocks have other students assist them. It may help to draw the Seven Brothers constellation and the Fixed Star on the board and have students practice with their clocks in a lighted room.
• Remind students to be gentle with their star clocks. Hard use of the inner wheel will enlarge the hole and reduce the accuracy of the clock.
• Don’t forget about standard and daylight time. The star clock reads in standard time. Subtract an hour from the clock time for daylight time.

Assessment and Questions for Discussion
• Move the star field in the Starlab and call on individual students read their clocks. Have other students check their answers.
• Is there a way to find the Seven Brothers constellation using the star clock?
  If you know the time and the calendar date, you can set the star clock and its position will show you where the Seven Brothers are located.
• Why is it important to know the calendar date when using the star clock?
  Ask students if they have noticed that certain constellations are only visible in the summer evening sky while others are only visible in the winter evening sky. The reason for this is that Earth orbits the Sun. No matter which side of the Sun Earth is in its orbit, the night sky is always in the direction away from the Sun. As a result of Earth’s orbit, different stars are seen in each season of the year. (Exception: Circumpolar stars are always visible.) Knowing the calendar date permits users of the star clock to align it properly with the night sky.
• How did the Old Ones estimate time without star clocks?
  The end of the Seven Brothers (Big Dipper handle) sweeps through the sky like the hour hand of a clock. Watching the movements of the Last Brother (end of the dipper handle) provided a good indication of the passage of time.

Extensions:
• Have students investigate the wobble of Earth’s axis. The wobble or precession can be demonstrated with a spinning top or a gyroscope. How does this wobble affect the Fixed Star? What is the period of the wobble? (See resources below.)
• The movements of stars can be captured on camera film during a long exposure. You will need an adjustable camera (not digital), tripod, and a locking cable release. Set up the camera on the tripod and point it at the Fixed Star. Keep the shutter open for an hour or two. Circular star trails will appear on the developed prints. Point the camera to the south and the trails will be in the shape of long arcs. For longer exposures, use a smaller aperture of the camera to reduce washout of the film.
• Read the story of the Seven Brothers and the Fixed Star in the appendix. Ask students to explain the story and how it relates to the star clock

Star Fact
People living south of the equator are not blessed with a fixed star. By chance, no bright star is aligned with the extension of Earth’s southern axis.
**Star Fact**
Earth’s North Pole is slowly pointing away from the Fixed Star. Like a spinning top, Earth’s axis wobbles. The wobble, or precession, accumulates to about a 1 degree shift every 72 years. Today, the fixed star inscribes a small circle around the true north pole as Earth rotates. It will take approximately 26,000 years for the axis to directly point at the Fixed Star again.

**Resources:**
Learn about Earth’s rotation, the Fixed Star, and precession.
http://homepage.mac.com/kvmagruder/bcp/precession/northstar.htm
http://en.wikipedia.org/wiki/Precession_of_the_equinoxes

See examples of star trails and learn how to take star trail pictures.
http://www.astropix.com/HTML/I_ASTROP/TRIPOD/TRIPOD2.HTM

*A-ne’ma-ye ek’ko tsis*
Star Clock Back Wheel
Star Clock Front Wheel

Blackfeet Skies
DESCRIPTION
Students construct model Blackfeet tipis and create a painting design depicting astronomical objects.

CONCEPT
Painted Blackfeet tipis traditionally included symbols representing stars and other sky objects the Blackfeet were able to see with the unaided eye.

ESTIMATED TIME
One hour to construct and decorate a tipi model from a single sheet of heavy-weight paper. Several hours if constructing larger tipis with larger pieces of paper or cloth.

MATERIALS AND TOOLS
(per student)
Tipi Pattern on heavy-weight paper
6 wooden skewers or 6 8-inch pieces of 1/8” wood dowels
Cellophane tape
Colored crayons or markers
Scissors
(for class)
Star Map for use in Starlab
Small flashlight with red lens for viewing the map
(See extensions if building larger tipis.)

Blackfeet Star Stories
See Appendix A.

Star Lore
In an area of immense beauty, the nomadic Blackfeet of the buffalo days lived challenging lives. Summers were hot and winters harsh with strong winds and storms racing across the rolling landscape.

The Blackfeet depended upon the buffalo. Great herds roamed the plains. As naturalists, the Blackfeet understood the migration patterns of the herds. They didn’t have to follow the buffalo because they knew when the herds would move and where they would go. Using their knowledge of buffalo behavior, the growth cycles of food and medicinal plants, and star signs that indicated seasonal changes, they relocated their camps in time to meet the herds.

Besides food and clothing, the abundance of the buffalo provided shelter. Hides were tanned and stitched together to form the covering for an ingenious portable dwelling – the tipi. Tipis were a perfect match for the conditions and materials available in the Rocky Mountains and on the Great Plains of Montana and Canada. They were light, strong, and comfortable. They could be struck (taken down), carried to a new location, and reassembled in short order. (Because of their knowledge of herd migration and star signs above, tribes could safely cache sets of tipi poles in encampment locations to use on their return following years.)

The Blackfeet tipi, ancient in origin, was a conical structure varying in size depending upon the needs and wealth of individual families. Four long poles were lashed together near the top and their lower ends spread out to form a pyramid shape. The initial four-pole pyramid distinguishes
Blackfeet tipis from other plains tribes that traditionally lashed three poles to form the initial structure. Once erected, more straight poles were placed in the forked seat between the tops of the first poles. The spacing of the pole ends inscribed an oval shape on the ground. The upper end of the hide cover was lashed to another pole and raised to position. The cover was then wrapped from both sides around the other poles. The edges of the cover were overlapped and a seam was stitched together with small straight sticks through matching holes. Small stakes anchored the lower edge of the cover to the ground. A large hole, always positioned facing eastward to greet the rising Sun, permitted entry and exit of the tipi. The entry was covered by a weather flap attached from above. Two additional poles were inserted into pockets in the “ear flaps” near the top of the cover. By adjusting the flaps, a smoke hole could be opened or closed depending upon the weather. The shape of the tipi created an efficient chimney to draw smoke and heat from a fire set in the middle of the dirt floor. The flaps served as a thermostat. If desired, the lower edges of the cover could be rolled upwards to increase ventilation.

Seen from the side, the cone-shape of the Blackfoot tipi was asymmetrical, meaning that it was steeper on the backside than on the door side. This tilt provided additional strength and stability in the strong prevailing winds. The design was an early application of modern principles of aerodynamics!

The construction and assembly of Blackfeet tipis was primarily woman’s work. Hide preparation and stitching was done by women. Women struck the tipis, loaded the poles and coverings on dogs or horses, led them to the new camp, set up the tipis, and arranged the interiors. The role of Blackfeet men was to hunt buffalo and provide the hides. On occasion, tipis were painted and this was the job of the men.

Painted tipis were picturesque and much envied. The design of a tipi painting was unique and belonged to individual families. They were highly symbolic. The act of painting was associated rituals, ceremonies, and medicine bundles. The particular design of a tipi was revealed to its owner through dreams and visions following long periods of fasting and isolation. Owning a painted tipi was a responsibility of great importance. Painted tipis gained power and protection for families. When the hide coverings wore out, the design would be transferred to a new covering. The designs on the old covering would be carefully measured for size and placement with the use of measuring sticks.

Generally, a painted tipi design is divided into three distinct horizontal zones, each with great symbolic meaning. Around the base is a dark colored ring representing mother Earth. Along the top of the ring are raised rounded or pointed projections representing hills or mountains. Light colored circles in a single or double row are spaced around the ring. The circles represent puffball fungus found in circles on the plains. A tap on the fungus releases a clouds of spores resembling a puff of What sky symbols would the Blackfeet of old have created had they been able to see the sky as the Blackfeet of today can see with telescopes and other instruments?
In Blackfeet star mythology puffballs are fallen stars, the souls of people who have died.

The middle and widest zone of the tipi is filled with pictographs of animals (spirit helpers), people, or symbols representing heroic deeds or important events in tribal history. Painted tipis are named for these symbols (e.g. Otter Tipi, Beaver Tipi, Serpent Tipi). The background is usually left the natural whitish color of the hides.

The upper part of the tipi, stained by smoke, is usually painted dark to represent the sky. Circles and crosses represent stars, the Sun, and the Moon. A circular cluster of stars represents the Bunched Stars or the Lost Children (Pleiades). Seven circles in a pattern resembling a dipper, represents the Seven Brothers. A cross represents the Morning Star. (Crosses may also be used to represent butterflies.) When portrayed, the Bunched Stars are always placed next to the left smoke flap (facing the tipi entrance) and the Seven Brothers on the right smoke flap. When the tipi is erected, with the door facing the rising Sun, the Seven Brothers are oriented towards the northern sky and the Bunched Stars toward the southern sky. This reflects the true orientation of these two constellations.

The arrangement of the three zones in a painted tipi is significant. The middle zone, representing visions or tribal history, is the spiritual link between Earth and heaven.

**Starlab Demonstration:**
Point out significant Blackfeet constellations in the Starlab. Use a star map to help you locate them. Some of these constellations and other sky objects are commonly portrayed in tipi art. Tell some of the star stories found in the appendix. Note: Not all the constellations are visible at the same time. Some are prominent in the summer evening sky and others in the winter evening sky. Rotating the star field brings all seasons into view. The Wolf Trail, however, can be seen in both summer and winter but the summer Wolf Trail is much brighter. The difference is due to the shape of our galaxy. The galaxy is a complex spiral consisting of six spiral arms that branch out from a bar-shaped nucleus of tens of billions of stars. We are located in one of the arms. In the summer, the night sky looks toward the center of the galaxy and the bulk of the stars that reside there. In the winter, the night sky looks outward from the center where there are far fewer stars. The table on the next page lists the seasons to observe some Blackfoot constellations and sky objects in the evening sky. Depending upon the time of the year, these same constellations and objects may also be visible in the early morning sky just before sunrise.

**Star Fact**
Several years ago, astronomers used the Hubble Space Telescope to take a picture of a tiny area within the Seven Brothers constellation. In a patch of sky that could be covered by a grass seed held at arm's length, they detected over 1500 galaxies, each containing billions of stars.
Activity: Making A Painted Tipi

1. Conduct a discussion on Blackfoot tipis. Have you ever lived in a tipi or seen one up close? How was the tipi set up? What are its parts? What do the painted symbols on the outside represent?

2. Give each student a copy of the tipi pattern printed on heavy-weight paper. Also provide scissors. Have students cut on the solid outer line of the pattern. Stress that care in cutting will result in a fine tipi.

3. Have students fold the smoke hole flaps (upward) along the dotted lines. Show them how to curl the pattern to form the cone shape. Do not let them permanently join the edges together at this step.

4. Discuss the symbols that are used for painting tipis. Talk about the three zones: Lower - Mother Earth, Middle - Their world (their visions), Upper - the sky. Draw sky symbols on the board that Blackfeet of old used for their tipis. Discuss what is meant by visions.

5. Discuss the new things we know about the sky. Show pictures taken by the Hubble Space Telescope (HST) or have students research HST discoveries on the Internet. Share ideas for new sky symbols to use for decorating their tipis.

6. Have students make sketches of their decorating ideas.

7. With their tipi patterns laid out flat, have students lightly sketch their designs in pencil. They should check how their design looks when the tipi is curled into the cone shape. After making adjustments and improvements, have students color in their designs. Remind them that the design of a painted tipi belongs to the person that created it. No copying!

8. When tipi designs are completed, tipis should be curled into a cone and taped inside and out. When properly aligned, the circles for the door will lie exactly on top of each other.

9. Complete the tipi by inserting the sticks into the tipi from the top so their lower ends spread out equally.

Tips

- Do not provide the sticks for the tipis until students are ready for final assembly. If using skewers, cut off a couple inches of stick on the pointed end to make them match the scale of the tipis. The sticks can be snapped or cut with heavy shears.
- Have students help each other when taping the tipi together.
- Stick placement can be tricky. In full-size tipis, the sticks are set up first. It may help to keep the sticks in place by taping them on the inside of the tipi.
- For display, partially fill the lid of a copy paper box with sand. Set up several tipis and add twigs and pebbles and other objects to create a village scene.

<table>
<thead>
<tr>
<th>Blackfeet Constellation or Object</th>
<th>Classical Constellation or Object</th>
<th>Season to Observe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seven Brothers and their Sister</td>
<td>Big Dipper and North Star</td>
<td>Anytime</td>
</tr>
<tr>
<td>Ashes Chief and Stuck Behind</td>
<td>The stars Castor and Pollux in Gemini</td>
<td>Late Winter</td>
</tr>
<tr>
<td>Smoking Star</td>
<td>Great Nebula in Orion</td>
<td>Winter</td>
</tr>
<tr>
<td>Spider Man's Fingers</td>
<td>Hercules</td>
<td>Summer</td>
</tr>
<tr>
<td>Wolf Trail</td>
<td>Milky Way Galaxy</td>
<td>Anytime</td>
</tr>
<tr>
<td>Lodge of the Spider Man</td>
<td>Corona Borealis (Northern Crown)</td>
<td>Summer</td>
</tr>
<tr>
<td>Bunched Stars or Lost Children</td>
<td>Pleiades</td>
<td>Winter</td>
</tr>
<tr>
<td>Hand in Sky</td>
<td>Unknown</td>
<td>?</td>
</tr>
</tbody>
</table>
Assessment and Questions for Discussion

• Have students write a few paragraphs describing their tipis, especially explaining the sky symbols used. What do the symbols represent?
• Have students give an oral reports describing their tipis.

Extensions:

• Challenge students to make larger tipis out of paper grocery sacks or cloth. If more than one paper sack is needed for the tipi covering, have them stitch the pieces together with needle and thread. Larger tepis will require longer poles. Use straight sticks from bushes or trees. Tape may not be needed for assembly.
• Have older students study the geometry of the tipi. Tipis consist of conic sections. The outline of the lower edge of the tipi pattern is a half-oval. How would the tipi look if the shape were a half circle? (A perfect cone.)
• Investigate the “air conditioning” of tipis. How does their design keep fires fanned and the tipi interior from filling with smoke? Compare this to home fireplaces.
• If students are members of families that own painted tipis, ask them to share pictures of their tipis and explain its significance of the art. If possible, invite the family to bring the tipi to the school and demonstrate how it is set up.
• Challenge your students to identify the compass directions from a painted tipi picture. The serigraph of the Snake Tipi is oriented with the opening facing east. The Seven Brothers are facing north and the Bunched Stars are facing south. The key to identifying directions is the placement of the opening. It is always oriented toward the rising Sun.
Resources:

Historic Tipi Pictures
A great collection of Blackfoot tipi photographs are available in the online catalog of the Glenbow Museum in Calgary, CA. This is the photo search page. Enter a year span (e.g. 1890 : 1930) and the subject “Blackfoot dwellings” to view a large collection of tipi photographs.

Hubble Space Telescope Images
The image wealth of the Hubble Space Telescope is available online. Click on “gallery” and then on “picture album.”
   http://hubblesite.org/

The Planets
Spacecraft planetary images from the earliest interplanetary spacecraft to the present are contained in this massive collection. Click on a planet in the opening screen to see the images, timelapse movies, and 3-D images.

Historic Painted Tipi Description
Walter McClintock provides fascinating description of Blackfeet life around the turn of the 19th century.

A-ne’ma-ye ek’ko tsis
Many Moons

DESCRIPTION
Students investigate Moon phases with models and diagrams.

CONCEPT
The phases of the Moon are a regular but changing sequence of light and shadows on the due to the positions of the Earth, Moon, and Sun.

ESTIMATED TIME
60 minutes

MATERIALS AND TOOLS
(per student)
- Moon model *
- Ping pong ball
- Wood skewer
- Scissors
- Many Moons Cards
  (per student or group - printed front and back on heavy weight paper)
  (for the class)
- Clear light bulb (40-60 watts)
- Clamp lamp fixture without the reflector
- Hot glue and gun
- Ice pick
- Butane lighter
  * See instructions in pre-activity.

Blackfeet Star Stories
- Six Brothers
- Scarface
- Fixed Star
- Moon Woman

Star Lore
There are many reasons why the Moon is an important character in Blackfeet star stories. Its appearance in the sky is dramatic. After the Sun, the Moon is the brightest sky object. The Moon subtends a disk equal to the diameter of the Sun’s disk. When full, the Moon bathes the nighttime rolling plains east of the Rockies with comforting soft silvery light. The Moon’s face grows and contracts through a regular cycle of phases.

Like all indigenous people, the Blackfeet of old watched the Moon. Moon phases were important indicators of the passage of time. (The modern calendar unit of the month is based on the lunar cycle.) Epic journeys of raiding parties were measured in the number of full Moons that had passed before the parties returned. Furthermore, full Moons were the harbingers of seasonal change. Specific full moons were linked with important events such as bird migrations and the growth of medicinal plants. In late December and early January, the first full Moon of winter was named the “Time of the First Chinook.” The “Moon of Flowers” occurred in late June or early July. In October and early November came the Moon “When the Birds Fly South.”
The Old Ones did not completely understand Moon phases. Few people of the time, if any, did. The Blackfeet could see a link between Moon phases and the position of the Sun. For example, they could see the full Moon rise in the East just as the Sun set in the west. In the early morning hours, the Blackfeet could watch the waning crescent Moon rise in the east shortly followed by the rising Sun.

Understanding Moon phases required reordering the heavens. The belief in a fixed Earth with the Sun, Moon, and circling stars circling was replaced by a spinning Earth revolving around the Sun. An important part of that reordering was to move the Sun and Moon to their proper places.

Because the Sun and Moon appear to be the same diameter, it is easy to mistakenly conclude the two bodies are the same distance from Earth. Actually, the Sun is about 390 times farther from Earth than the Moon. The reason the two bodies appear to be the same size is that the Sun is about 400 times wider across than the Moon. Different distances and diameters produce a geometric effect that makes the two bodies appear to be the same size.

What are lunar phases? Moon phases are stages in a regular visual effect produced by the advance and retreat of light and shadows across the Moon’s surface. At times, we see the surface fully lit up by the Sun. At others, it is completely dark and still other times it is partially light and partially dark.

The different phases of the Moon are due to another geometric trick. It’s all about the relative positions of the Sun, Earth, and Moon. When the Moon is between the Earth and the Sun, the shadow side of the Moon faces Earth. We call this the New Moon. When the Moon is on the opposite side of Earth from the Sun, we see its fully lighted side. This phase is called the Full Moon. When the Moon, Earth, and Sun form a 90 degree angle with each other, the Moon’s surface appears to be divided down the middle—half light and half dark. This phase is called the First Quarter or Last Quarter depending upon whether it occurs before or after the Full Moon. The names of the phases of the Moon, in order, are given in the diagram to the right.

**Star Fact**
Earth rotates west to East and the Moon orbits Earth west to east. The reason the Moon rises in the east and sets in the west is that Earth rotates much faster than the Moon orbits Earth. The effect is similar to a fast car passing a slow car. The slow car appears to go backwards.
Pre-Activity: Making Moon Models
(This should be done by the teacher and not by the students.)
1. Heat the tip of the ice pick with a butane lighter or propane torch. When heated, touch the tip to the side of a ping pong ball (where the label is). The heated point will penetrate the ball and form a hole. Do not pass the pick all the way through the other side. The hole should be just large enough to slip the blunt end of the skewer or an 1/8” inch dowel through it.
2. Repeat with enough balls so that each student can have a ball to work with.
3. Cut the pointed tips off the skewers. Cut the sticks in half. This can be done with a sharp knife on a cutting board. Roll the stick with the knife blade. The blade will make a clean score around the stick. Snap the stick on the score line.
4. Heat the glue gun. Squeeze a dollop of glue on to the end of a stick. Slip the stick through the hole in the ball until it touches the other side. Some of the glue will remain around the hole while the rest is pushed inside to anchor the end against the inside of the ball. Make sure the stick goes straight into the ball and not off to the side! When the glue has cooled, the Moon model is ready.

Activity: Making Moon Phases
1. This activity can be done in a darkened classroom or in the Starlab planetarium.
2. Place the light bulb in the center of the classroom or Starlab. There should be enough personal space around each student so that they can hold one arm out and swing it in a circle without bumping others.
3. Ask your students for ideas on what causes Moon phases. If a student mentions sunlight and shadows, ask that student or others to elaborate on the idea.
4. Give each student a Moon model. Explain that the ping pong ball represents the Moon and the light bulb represents the Sun. Ask them what represents Earth? (Their heads!)
5. Demonstrate how to move the Moon model to orbit the Earth. Hold your arm outstretched and slowly swing it in a circle around your head (counterclockwise). You will have to adjust your body or switch arms. It is important to watch the Moon as it makes a complete orbit. Tell your students I just saw the Moon go through its phases.

Star Fact
Moon phase terms can be confusing.

*Terminator Line* - The line separating the light and dark (day and night) portions of the Moon.
*Waxing* - Growing.
*Waning* - Shrinking.
*Gibbous* - A hump, or in the case of the Moon, a bulge or convex curve in the terminator line.
*Quarter* - While it looks like you are seeing half the Moon lighted, you are actually seeing only one quarter of the Moon's surface.
*Full Moon* - Even though the whole face of the Moon is lighted, you are really only seeing one-half of the Moon.
6. Have your students orbit their Moon models around their “Earths” (heads). Tell them to watch for changes in the shadows on the Moon.

7. Give each of your students set of the Many Moons Cards. (The cards can be shared among several students.) Have them cut out the cards and arrange them in a circle following the direction on the cards.

Tips

- Students often mistakenly think Moon phases are caused by Earth’s shadow. Actually, when the Moon passes into the shadow, a lunar eclipse is beginning.
- Have students create lunar and solar eclipses by positioning the Moon model into the shadow cast by their head or passing the Moon directly in front of the Sun.
- To avoid creating eclipses, have students raise the Moon model slightly so that it doesn’t pass into the shadow of their heads. Refer to the diagram below that shows the tilt of the Moon’s orbit.

Assessment and Questions for Discussion

- Have students write a short explanation of Moon phases to go with their completed work sheets.
- What phase is the actual Moon is in now?
- Have you ever seen a lunar eclipse? What does the Moon look like during an eclipse?

Extensions:

- Have students draw a diagram showing what happens when there is a lunar eclipse. Investigate the stages in a lunar eclipse (umbra, penumbra). When will the next lunar eclipse occur?
- Have students create artwork incorporating the Moon in its various phases.
- Have students create a month-long Moon sky map. Tell them to pick a location where they live, face the south, and draw a small sketch showing the position of the Moon along the horizon.

Star Fact

The light coming from the Moon is reflected sunlight.
and its shape at a particular time of night. Have them wait two or three days and go out at the same time and make a new sketch. It will help if the students stand in the same place each time. Repeat the sketching a few more days later. Students will observe the Moon’s phases and they will see it go from a thin waxing crescent Moon in the west to the full Moon in the East.

- Construct Blackfeet Calendar Sticks to learn how to track time and the Full Moon cycle. See the web site below for more information.

**Resources:**

Fraser, Francis, 1990 reprint, The Bear Who Stole The Chinook, Douglas & McIntyre, Vancouver/Toronto. (References to full Moon names: Moon of the Eater, p.4, Moon of Frogs, p. 10, p. 57, Moon of Birds Fly South, p. 103.)

McClintok, Walter, 1999 reprint, The Old North Trail, Life, Legends of the Blackfeet Indians, University of Nebraska Press. (Calendar of Moons as told by Brings-Down-The-Sun, p. 486-7.)

Learn about the Blackfeet Calendar Stick in an online presentation by Latrice Tatsey given at the Blackfeet Community College. The calendar stick measures the time and season and wind direction.


See lunar eclipse pictures.

http://spaceweather.com/eclipses/gallery_15may03.html

Learn about astronomical events and much more by signing up for headline news emails.

http://science.nasa.gov/

For downloadable pictures of the Moon

http://nssdc.gsfc.nasa.gov/photo_gallery/photogallery-moon.html
http://www.lpi.usra.edu/expmoon/

Moon phase calendar.

http://aa.usno.navy.mil/data/docs/MoonPhase.html

More information about Moon phases including great time-lapse videos.

http://aa.usno.navy.mil/faq/docs/moon_phases.html

*A-ne’má-ye ek’ko tsis*
The Moon’s orbit is tilted slightly. Even when the Moon is opposite Earth from the Sun, it is usually above or below Earth’s shadow. The orbit wobbles and occasionally everything lines up so that the Moon passes within the shadow (lunar eclipse) or casts a shadow on Earth’s surface (solar eclipse).

**Arrangement of the Many Moons Cards**
**Many Moons Cards**

**Instructions:**
- Cut out each of the cards.
- Pick a direction for the Sun.
- Pretend you are Earth.
- Place each of the cards in a circle around you representing the Moon’s orbit.
- Put the cards in the right order and places to show the different phases of the Moon.
- Tip: Start with the New Moon and place it in the direction of the Sun. Place the next card to the left of the New Moon.

<table>
<thead>
<tr>
<th>Waxing Crescent</th>
<th>Waning Crescent</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Moon is just to the east of the Sun. A small curved area on the near side is visible.</td>
<td>The Moon is to the west of the Sun. A small curved area on the near side is visible.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>First Quarter</th>
<th>Waxing Gibbous</th>
<th>New Moon</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Moon is 90 degrees to the East of the Moon. You now see one quarter of the whole Moon.</td>
<td>The Moon is now almost exactly on the opposite side of Earth from the Sun.</td>
<td>The Sun is behind the Moon. The Moon’s near side is all in shadows and can’t be seen from Earth.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Waning Gibbous</th>
<th>Full Moon</th>
<th>Last Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Moon is now just past the half way point around Earth. Part of the Moon is again in shadow.</td>
<td>The Moon is now exactly on the opposite side of Earth from the Sun. You now see one half of the whole Moon.</td>
<td>The Moon is now 270 degrees or three quarters around Earth in its orbit. You now see one quarter of the whole Moon.</td>
</tr>
</tbody>
</table>
DESCRIPTION
Students investigate the effect of shadows on observations of the Moon and create their own Moon Face.

CONCEPT
Light and dark areas on the Moon have led people to imagine all sorts of fanciful things. The appearance of lunar surface features is enhanced by shadows created by low Sun angles during lunar phases.

ESTIMATED TIME
15 minutes for the shadow demonstration.
30 minutes for the Moon face activity.

MATERIALS AND TOOLS
(per student)
Copy of the Full Moon picture
Markers or crayons
(for the class)
Flashlight
Water heater drip pan or copy paper box lid
Dry playbox sand or river sand

Star Lore
At the end of the Blackfeet star story Moon Woman (see appendix), listeners learn why the woman in the Moon only has one leg. The shape of the woman is seen in the Moon’s light and dark surfaces. In other oral traditions the woman is a witch, man, dog, rabbit, or some fanciful creature.

Seeing something familiar in the light and dark areas of the Moon’s surface is common to many cultures. Throughout history, the Moon’s appearance to the naked eye inspired much thought and speculation. The Greek philosopher Aristotle believed in the perfection of the heavens and therefore the Moon was a perfect body in space. That belief was challenged in the early 1600s by the invention of the astronomical telescope. The telescope enlarged the Moon and made it appear as though it had been moved closer to Earth. Over the years, improvements in telescopes demonstrated that the Moon was not perfect. Its surface is pocked with craters and dark basins and crossed by chains of mountains, cracks, and ridges. Observers wondered how the craters and the large dark areas formed. Were the craters the blown-off tops of volcanic mountains? The dark basins were obviously seas and were given the Latin name maria (seas).

By the time of the Apollo expeditions to the Moon, scientists had concluded the craters were really created by impacts of meteors and asteroids. The maria were gigantic impact basins later flooded and smoothed with dark lava. We know today the face of the Moon is ancient. We see the same face Blackfeet saw thousands of years ago. If we could turn the sky clock backward a billion years, we would still recognize the Moon’s surface. Unlike Earth, the Moon does not have an atmosphere. No wind, rain, snow, or vegetation breaks up and rejuvenates the lunar surface. Erosion on the Moon is extremely
Observing the Moon with binoculars or a telescope is a delight. The details are astounding. Experienced observers will tell you that the best time to look at the Moon is when it is partially full. The craters and all the other surface features jump out at you. A full Moon is actually bland. You see the light and dark areas but the sharp detail is gone. The difference in the two views is due to shadows. During a full Moon, the entire Earth-facing side of the Moon is lit by the Sun. Sunlight falls straight down. Shadows are always the shortest when the Sun is high in the sky. During other lunar phases, the sunlight strikes the Earth-facing side at a low angle. Shadows stretch out. The contrast between the lighted surface and the dark shadows accentuates the lunar contours.

**Starlab Demonstration**

Place a tray on the floor inside the Starlab. You can also do this in any room that can be darkened. A black plastic drip pan for a water heater makes an excellent tray but any tray can be used. Place a 1 to 2-inch layer of dry sand in the tray and make its surface level and smooth. Arrange your students so that they each have a good view of the tray. Ask a student to make a depression in the sand to represent a meteor crater. Have other students make craters, ridges, and furrows. If you have some small pebbles handy, place a few around the tray. Turn on the flashlight and turn off any other lights in the Starlab. Shine the light directly down at the center of the tray in a 90 degree angle. Ask students to observe the sand. They will see hints of shapes in the sand and the pebbles but not much detail. Next, move the light to one side of the tray or another and shine the light from a low angle. Again, have students observe the sand. Shadows will bring the surface contours into sharp focus! Move the light to the other side of the tray. Shadows, cast by surface irregularities, enhance the detail visible on the Moon’s surface during its monthly phases. During the full Moon, surface features are more difficult to make out because of high Sun angle.
The shadows will change direction but the details will still be apparent. Compare this demonstration to the phases on the Moon. Lunar surface details are much easier seen with low sunlight angles than when the Moon is full.

**Activity**

1. Tell the *Moon Woman* story to your students.
2. Talk about imagination. Have you ever seen the shape of a person or some object in the clouds? Are there rock formations, mountains, or hills on the Blackfeet reservation that resemble people or things?
3. Show your students a picture of the full Moon (see resources). Ask your students to look for the woman in the Moon. Where is she? Discuss ideas.
4. Give each student a copy of the full-page picture of the Moon. Have them draw lines along the shadows to outline the woman in the Moon or find some other creature or thing they imagine. If they would like, the picture can be rotated to any orientation.
5. Have students write stories about the thing(s) they drew on the Moon’s surface.
6. Display student drawings and have students describe their pictures and tell their stories.

**Tips**

- Do the Moon phases (Many Moons) activity before doing the Starlab demonstration.
- Place a picture of the full Moon on the front board and have students make sketches of it from their seats. Pictures drawn by students in the front of the class will show more detail than those drawn by students in the back. Some of the pictures from the greater distance may show broad features resembling faces or other objects.

**Assessment and Questions for Discussion**

- Ask students to write a paragraph explaining why it is easier to see details of the Moon’s surface when the Moon is one-quarter full than when it is full.

**Extensions**

- Invite a local amateur astronomer to bring a telescope to school for a nighttime observing session on the Moon and other sky objects. Schedule the observing session for a time other than the full Moon. During the full Moon, the reflected light from the Moon lightens the sky and makes it difficult to see fainter objects, such as the Wolf Trail (Milky Way) Binoculars are also useful for Moon and

---

**Star Fact**

Because of very slow erosion, Apollo astronaut footprints are expected to last a million years on the Moon.
star gazing. They provide a broad field view and make it easy to find faint objects.

- Have students collect stories and myths about the Moon from the Internet. Some sources are listed below.
- Students may wonder why we only see one side of the Moon. The reason for this is that the Moon’s rotational (spin) period and its revolutionary (orbit) period are the same length. This is caused by gravitational coupling. The combined gravitational attractions of Earth and the Moon on each other produce tides. On Earth, tides are most easily seen in the rise and fall of oceans. But, tides of lesser height also occur in the solid Earth and the solid Moon. Over billions of years, the lunar tide has produced a drag effect that gradually slowed the Moon’s rotation. Today, the Moon’s rotational period exactly matches its revolution, causing a near side, that we see from Earth, and a far side, that we never see from Earth. That results in a lunar day that lasts approximately 14 Earth days and a 14-Earth-day lunar night. The diagram below shows a pole stuck in the Moon’s surface. In each different point in the orbit, the pole is pointing in different direction related to outer space but always at the Earth.

**Resources**

Click on any of these images and receive options for downloading low or high resolution Moon images.


Find about different cultural myths about the Moon at this location.

http://www.windows.ucar.edu/tour/link=/mythology/planets/Earth/moon.html

This site includes a selection of Native American Moon stories.


**A-ne’ma-ye ek’ko tsis**
Can you find Moon Woman?
What other person, animal, or thing can you find in the light and dark areas of the Moon?
Use a marker to outline your discovery.

Write a story about your drawing on the back of this paper.
DESCRIPTION
Students will create a scale model of the Earth and Moon.

CONCEPT
The distance between the Earth and the Moon can be expressed as a ratio of Earth’s circumference to distance.

ESTIMATED TIME
30 minutes

MATERIALS AND TOOLS
(per class)
- Balls of various diameters or round fruit such as an orange and a grape
- Earth Globe
- String

BLACKFEET STAR STORIES
- Six Brothers
- Scar-Face
- Fixed Star
- Moon Woman

Star Lore
The Moon is a prominent character in many Blackfeet star stories. In most stories, the Moon is the wife of the Sun. She is more gentle than the Sun and when a Blackfeet hero needs a favor from the Sun, it is the Moon that pities the hero and petitions the Sun for the favor.

In Six Brothers (Bunched Stars or Lost Children) story, six poor children use weasel hair to travel to the house of the Sun and Moon. An ugly facial scar is removed by the Sun in the story Scarface. Scarface wants a lovely maiden who tells him that he must remove the scar before she will marry him. He travels long and hard before arriving in the land of the Sun and Moon. A young woman in the Fixed Star story wants the Morning Star for her husband. Morning Star puts an eagle plume in her hair and she is transported into the sky to live with Morning Star and his parents, the Sun and Moon. Later, she digs up a forbidden turnip and is banished back to Earth. Spider man (Hercules constellation) lowers her to Earth on a spider web strand. In the Moon Woman story, a wife leaves her husband to live with Morning Star. As they shoot up through the smokehole of her husband’s lodge, she looses a leg. The story explains why the woman in the Moon has only one leg.

Each of these Blackfeet star stories employ mystical methods for traveling to the Moon that are not explained. The important part of each story is what happened when people arrived in the sky and not how they got there.

Until 1969, physical travel to the surface of the Moon was possible only in imagination. On July 20, 1969, that all changed. Two American astronauts became the first humans to stand on the Moon’s surface. Their journey to the Moon took three days. After a powerful push by a Saturn V rocket, they coasted to the
Moon and used rocket thrust for the landing.

Journeying to the Moon is no small feat. Rockets are the only technology we have that can accomplish the task. For Apollo, a strong initial thrust accelerated the spacecraft to 25,000 miles per hour. Upon engine shutdown, the spacecraft began a three day coast toward the Moon. Gradually, Earth’s gravity diminished the spacecraft’s speed until it had dropped to about 2,000 miles per hour. By then, Apollo 11 was close enough to the Moon for its gravity to take over and draw into orbit. By the time the Apollo crew arrived in the realm of the Moon, they had traveled across a gap of 238,000 miles.

Many children and adults have misconceptions about Moon travel. For example, ask them to make a scale drawing or a model of the Moon and Earth. They invariably place the Moon much closer to Earth than it should be. We share this misconception with the Blackfeet star gazers of old as well as with the star gazers of many ancient people. The Moon looks close and didn’t seem like much of an effort to travel to it.

Most likely, the distance misconception has to do with the Moon’s apparent size when it is on the horizon. At moonrise during the full Moon, the Moon looks very large and close as it rises above distant plains, forests, and cities. Six hours later, with the Moon high in the sky, it will appear smaller. The apparent size change is an optical illusion. You can verify the Moon does not change size by holding up a piece of three-hole notebook paper. Align one of the holes with the full Moon. At arm’s length, the Moon’s disk will just fill up the hole (it really does). Compare the full Moon at moonrise with the Moon when it is overhead. The Moon will fill the hole both times. One possible explanation for the illusion is that at moonrise, you also see distant buildings and trees on the horizon that look tiny. In comparison, the Moon looks large as it rises behind them. When high in the sky, there is nothing to compare the Moon to and it looks its normal size.
Moon Illusion

The full Moon looks huge when it rises above the eastern horizon. Hours later, with the full Moon high in the sky, it looks smaller. The Moons in these two pictures have same diameter. The vanishing point towards the horizon in the lower picture exaggerates the Moon’s size. Being near the horizon also changes the Moon’s apparent color. It tends to be orange for the same reason the Sun looks orange just before sunset. Just after moonrise, light from the Sun, reflected off the Moon, has to pass through more of Earth’s atmosphere than when it comes straight down. The violet end of the rainbow spectrum is filtered out by the greater thickness of air the light passes through, permitting the red end of the spectrum to dominate the Moon’s color.
Distances to the Moon, planets, Sun, and stars are far greater than they appear to the eye. Comparisons help students appreciate the scale of the universe.

Star Fact
Various techniques have been employed for measuring Earth-Moon distance. In 270 BC, Aristarchus devised a method for estimating the distance to the Moon during a lunar eclipse. Other scientists measured the distance by taking simultaneous sightings from widely-spaced locations and used trigonometry to calculate the distance. Apollo astronauts placed reflector prisms on the Moon's surface. Laser beams, sent from Earth, bounced back and yielded a precise distance measure based on the time it took for the beam to make the round trip.

Activity: Size and Distance
1. Set several balls of different diameters in a row in front of your students. Call for a volunteer. Give the student an Earth globe to hold. Tell the student to pick out another ball that represents the Moon. If Earth is this size, which of these balls is the right size for the Moon?
2. After the student has made his or her selection, poll the class for their opinions. Too big, too small, or just right? Take a vote. For older students, provide numbers that could help them decide.
   - Earth Diameter = 7,926 miles (12,756 km)
   - Moon Diameter = 2,158 miles (3,474 km)
   The proper ball representing the Moon will be approximately 1/4 the diameter of Earth. If your Earth globe is 12” in diameter, the Moon should be 3” in diameter (billiard ball or small orange). After taking the vote, explain which ball would represent the Moon and why.
3. Ask for three new volunteers. Give one student the Earth globe and another the ball representing the Moon. Tell them to stand apart from each other at the correct scale distance. If the Earth and Moon are this big, how far apart should they be? Give them a few moments and ask for a “final answer. Again, poll the other students. Are they too close, too far, or just right?
4. Hand the third volunteer a ball of string and tell that student to wrap the string around the Earth model nine and a half times. You will probably have to help keep the string from slipping off the globe during wrapping.
5. When the string wrapping is complete, pinch the string at the nine and a half mark. Send the volunteer with the Moon across the classroom with the other end of the string. Hold your pinched string end next to the Earth globe. When Moon has reached the end of the string, the Moon is at
the correct distance for the model. The actual scale distance will be surprising.

6. Talk about the model the students just created. Why did the string have to be wrapped nine and a half times around the globe? Earth’s circumference is approximately 25,000 miles. The average distance to the Moon is 238,000 miles. Nine and one half string wraps of the globe comes to 237,500 miles (a good approximation of the average Earth-Moon distance). The nine and one half ratio works with all Earth/Moon models. If using an orange and a grape for the Earth and Moon, the string is still wrapped nine and a half times.

7. Discuss other objects in the sky. Ask your students to speculate on how far away they are. (See extensions.)

**Starlab Demonstration**

Use size and distance activity with smaller balls inside the Starlab planetarium. A golf ball (43 mm in diameter) makes an excellent Earth. Use a large bead (about 10 mm in diameter) to represent the Moon. To make the bead easier to see, glue it to the end of a small stick. Using the 9.5 Earth circumference ratio, the Moon will be approximately 50.5 inches (1.28 meters) away. Try other sizes such as a softball and a large marble.

**Assessment and Questions for Discussion**

- Select two new balls for the Earth-Moon model. Ask them to estimate the distance these two balls should be placed apart to complete the model.
- Have students write a modern Blackfeet star story about going to the Moon.
- If a trip to the Moon takes three days, in what direction should you aim the rocket? (The Moon will travel about 75,000 miles along its orbit during that time. Compare shooting for the Moon with duck hunting. Where do you aim when trying to hit the duck?)

**Extensions:**

- Challenge student to create their own models for other sky objects. How far away is the Sun? How many wraps of string around an Earth globe will equal the Earth-Sun distance? How far away is Mars? How big is it relative to Earth? Etc. Refer to the resources below for solar system data.
- Solar system models are popular entries for science fairs. They often consist of Styrofoam spheres hung inside a cardboard box painted black. In most science fairs, such models receive low marks for accuracy. Ask your students to speculate on why such models are incorrect. (The spheres are not to scale. Jupiter, for example should be 11 times bigger than Earth. It might not even fit inside the box. The distances are not correct. If Earth were the size of a pea, the Sun would have to be approximately 240 feet away.)

**Resources:**

This site provides lots of facts and figures about the solar system. Click on the planet name to get the desired data.

http://nssdc.gsfc.nasa.gov/planetary/

This site is similar to the one above but the information contained is less technical.

http://solarsystem.nasa.gov/planets/index.cfm

This site provides information on the Moon illusion.

http://science.nasa.gov/headlines/y2005/20jun_moonillusion.htm

For more pictures of the Moon missions, go to this site.

http://www.apolloarchive.com/apollo_gallery.html

A-ne’ma-ye ek’ko tsis
**Description**

Students participate in interactive models to learn about planetary motions.

**Concept**

Planets orbit through a region of the sky called the ecliptic and their apparent sky positions are due to their own orbital motion and the orbital motion of Earth.

**Estimated Time**

45 minutes

**Materials and Tools**

2 Rope rings (25- and 35-foot circumference) - see activity instructions
Black permanent marker
Flashlight
1 Moon model from *Many Moons* activity
Low-watt lightbulb in small base.

**Blackfeet Star Stories**

*Fixed Star*

*Scar-Face*

**Star Lore**

Long ago, a few special stars caught the attention of Blackfeet sky observers. Except for the Fixed Star (North Star), they noted that most stars appeared to move across the sky together. The special stars, however, had their own motions. Slowly, they changed their positions in relation to the moving stars. The Greeks referred to these special stars as wanderers and called them planetes or planets. Blackfeet considered these stars so special that they gave them names and told epic stories about them. The planet Venus is called “Morning Star.” Jupiter is “Mistaken for Morning Star.” Mars is called “Big Fire Star.”

To the unaided eye, planets appear as bright star-like objects. While true stars always remain as points of light, (except when viewed with the most powerful telescopes), planets can be magnified to disk shape even with small binoculars.

The movement of the planets, though very slow (like watching bunch grass grow), is very noticeable over days or months if you use the starry background as a reference grid. Their paths broadly arc across the sky from the eastern to the western horizon. They never stray more than a few degrees above or below this path.

The path is called the ecliptic. It is an imaginary line the Sun traces through the sky as it appears to move in relation to the stars. The Sun’s apparent movement is due to Earth’s orbit. Every day, Earth moves along its orbit slightly less than 1 degree from its position the day before (circle = 360 degrees...one Earth orbit = 365.25 days). As a result, the Sun shifts its apparent position against the background of stars. To see this directly, you would have to dim the light of the Sun. However, you can tell changes are taking place because of the seasonal shift of the stars. A star that is visible to the south at midnight in December, for example, is not visible in July. In July, it is behind the Sun.

After 365.25 days, Earth and the Sun are back at their starting points. If you draw a line through each daily apparent position of the Sun for an entire year, you get a circle. This is the ecliptic. Since we see the circle from the

![Using special telescopes, Venus is seen as a dark dot when it passed in front of the Sun in 2004.]
side, the ecliptic appears as a broad arc in night sky. All of the planets, more or less, orbit the Sun in the same plane and their paths remain close to the ecliptic. Watch Morning Star (Venus) over a few months and you will see it move across the background of stars. When Morning star is to the left of the Sun, it is seen in the evening sky and sets after the Sun. When west of the Sun, it appears in the morning sky before sunrise. Because Morning Star and Earth are both moving at their own speeds along different orbits, their combined motions affect the apparent position of Morning Star against the background stars. The two movements cause Morning Star to move eastward and then appear to slow down and reverse its course and head westward (retrograde motion). The reason for this course change is best understood with a demonstration in the Starlab or a dark room.

This amazing image was captured by the Clementine spacecraft orbiting the Moon. To the left of the slight glare of the Sun are Saturn, Mars, and Mercury. The planets and the Sun loosely outline the plane of the ecliptic.

The ecliptic is the extension of Earth’s orbital plane out to the distant stars. Earth’s orbital motion causes the Sun to appear to move along that path. Morning Star and the other planets closely follow ecliptic.
Tie two orbit circles out of cotton clothes line. One circle should have a circumference of 25 feet and the other, 35 feet. Use a black permanent marker and place marks on the smaller rope circle every 20 inches (15 marks in total). This represents the orbit of Morning Star. Make similar marks on the larger circle (Earth) 17.5 inches apart (24 marks in total). Each mark on the two circles represents the distance Earth and Morning Star move in their orbits every 15 days. Lay the circles on the floor of the Starlab Planetarium or in the middle of a room that can be darkened. If in the Starlab, use the projector as the center of the two circles. Pick one (preferably short) student to play the part of Morning Star. Give that student a Moon model made in the Many Moons activity. The model will now represent Morning Star. Pick another student (also preferably short) to play the part of Earth. Give that student a flashlight. Have the other students find positions outside the larger circle so that they can observe the activity.

Have the inner student hold Morning Star above one of the marks on the inner rope and over his or her head. Have outer student hold the flashlight above one of the marks on the outer circle also above his or her head. “Earth” should aim the flashlight at Morning Star. Tell the observer students to keep their eye on the shadow of Morning Star on the Starlab dome. The shadow will show them which direction Morning Star appears in the sky as seen from Earth. Remind the observers that the Sun is located in the center of the two orbits (where the star field projector is positioned).

Tell the students to move to the next marks on their orbits (counterclockwise direction) when you snap your fingers or clap your hands. The shadow on the dome will shift slightly. Again, snap or clap so that the planets move to the next positions. Continue the snapping or clapping like a slow

---

**Star Fact**

The orbits of planets visible to unaided eyes (Mercury, Venus, Mars, Jupiter, and Saturn) cause them to appear to the right or left of the Sun at different times in the year. A planet located to the right of the Sun rises before the Sun. It is called a morning star. If located to the left, the planet sets after the Sun and is called an evening star. These are generic terms and should not be confused with the Blackfeet name Morning Star, meaning Venus. Venus is sometimes found to the left of the Sun and then is an evening star in astronomer terms.

---

The apparent eastern or western (retrograde) movements of planets along the ecliptic, is due to the combined effect of Earth’s orbital motion and the orbital motions of the planets themselves.
metronome. Gradually, the students will orbit the Sun a couple of times. Ask the observer students to describe what they saw. They should have noticed that Morning Star circles or orbits around the Sun in a counterclockwise direction. However, Morning Star’s shadow on the dome walls (which
represent the distant starry background) appears to change size and occasionally reverses course and move in a clockwise direction.

The direction changes have to do with how Morning Star and Earth pass each other in their orbits. Morning Star always travels in the same direction but Earth’s position occasionally makes Morning Star appear to go the other way for a time. Have other students take over the Morning Star and Earth roles and try it again so that the first two students can see the demonstration.

**Tips**
- The Starlab demonstration will work more smoothly if you have the students practice moving around their rope circles before giving them the model and flashlights.

**Assessment and Questions for Discussion**
- Have students write short paragraphs explaining why Morning Star moves across the sky and why it sometimes appears in the morning before sunrise or after the sunset.
- Do other planets move through the sky the same way Morning Star does? Yes. The daily movement of other planets, such as Mars, will be less because their orbits are larger and the planets move more slowly.
- Do the planets have phases like the Moon? Venus and Mercury have phases. Venus and Mercury have phases. To see the Venus phases, you will need a small telescope. Under the best circumstances, Mercury is difficult to see and a larger telescope is needed to see its phases. Mars and the outer planets do not exhibit phases to observers on Earth.

**Extensions**
- Place a low-watt lightbulb in the center of the Starlab. This represents the Sun. Tell your students to pretend that their heads are Earth. Have them turn their heads to the left (counterclockwise) but without moving their eyes. Point out that they are simulating the rotation of Earth with their heads. As they turn their heads, the Sun will appear to rise in the east (to their left) and set in the west (to their right). Next, hold the Morning Star model over its orbit to the right of the Sun (student’s right) side. Have students start with their head looking back over their right shoulders, representing early morning before sunrise. Have them rotate their heads counterclockwise. Morning Star will “rise” in their view before the Sun. Next, place Morning Star to the left of the Sun. This time, as students rotate their heads all the way to the left, Morning Star will set after the Sun.
- Have students go out at night and look for the planets. Check the Internet sites below for daily planet positions. Discuss how to spot a planet. Venus, Mars, Jupiter, and Saturn look brighter than nearby stars and their light usually doesn’t noticeably twinkle. Mercury is usually so close to the Sun that the glare blots it out. However, when it is visible, there are few visible background stars to confuse with Mercury. When looking for the planets, follow the ecliptic.
- Have students do further research on planetary motions. Introduce the term “retrograde motion.” This is the name for the temporary apparent backward movement of a planet.
- Have students write a star story of a journey to visit Morning Star. How will they travel? What will they find when they get there?
Resources
Monthly positions of the planets for the years 1900 to 2100 can be found with this site. You enter a year and get the positions for Venus, Mars, Jupiter, Saturn, Neptune, and Pluto. (The site hasn’t demoted Pluto yet.) Positions are given for the constellations the planets are located in. The site has a constellation abbreviation list. You will need a star map. If you want to fine Neptune, you will need a telescope and more precise location information than this site provides.

http://www.astro.wisc.edu/~dolan/Planets/

An up-to-date interactive star map showing the constellations along the ecliptic is available from the Taylor Planetarium of the Museum of the Rockies. Although the planets are not listed, they will be located within these constellations.

http://www.museumoftherockies.org/

A-ne’ma-ye ek’ko tsis
DESCRIPTION
Students construct a three dimensional model of the Seven Brothers.

CONCEPT
Constellations are groupings of stars that are used in mapping the celestial sphere. Familiar patterns we recognize as people and animals are chance alignments of stars.

ESTIMATED TIME
90 - 120 minutes

MATERIALS AND TOOLS
(per team of students)
- Foam rectangle about 4X7”
- 4 Plastic coffee stirrers
- 7 Glow beads (See Tips note)
- Ruler
- Scissors
- Marker
- Sharp pencil
- Student pages
- Low-temperature glue guns
- Celestial Coordinates Chart (for advanced project)

BLACKFEET STAR STORIES
Seven Brothers

Star Lore
The Blackfeet Seven Brothers constellation is the most famous of all northern sky star groups. Although given many names, such as the Big Dipper, Plough, Butcher’s Cleaver, Great Wagon, Casserole, and Odin’s Wain, the seven stars that make up this grouping is often the first and only constellation that many people know.

Even on perfect nights when thousands of stars are visible, it is easy to pick out the Seven Brothers. It is an important grouping for the Blackfeet. The high northern latitude of their ancestral home means that the Seven Brothers are always visible to the Blackfeet above the northern horizon (circumpolar stars). That is not the case for indigenous tribes to the far south, like the Navajo, and Hopi.

At lower latitudes, the Seven Brothers rises and sets and is not always visible at night. Another reason for the importance of the Seven Brothers to the Blackfeet is that two of the stars, Oo Kin Na and Beautiful Bird (also known as Little Sister and Eldest Brother), are almost directly in line with the Fixed Star (Polaris) regardless of the time of night. Technically, the Seven Brothers or Big Dipper, is not a constellation. Instead, it is an asterism. Asterisms are distinct patterns of stars within...
The Seven Brothers is a constellation. The Seven Brothers is a part of the constellation Ursa Major (Latin, meaning great bear). Ursa Major is one of 88 official constellations designated by the International Astronomical Union (IAU). The IAU divides up the entire sky or celestial sphere into 88 regions resembling a state map divided into counties. Ursa Major, the third largest constellation, represents a region of the northern sky many times bigger than the area covered by the Seven Brothers. The classic portrayal of Ursa Major is a bear shape. The bear has an excessively long tail that is sometimes explained in star myths. In the Blackfeet story of the Seven Brothers (see Appendix A), seven brothers and their little sister go to live in the sky. The littlest brother becomes the Fixed Star and the nearest pointer star (Oo Kin Na) is the Little Sister. The second pointer star (Beautiful Bird) is the eldest brother and, depending upon the story variation, the other brothers are arranged in order of age ending with the second youngest brother as the end star (Bladder of Water).

Modern astronomers are fascinated with Ursa Major because this region of the sky lies outside the plain of the Milky Way Galaxy (Wolf Trail). When astronomers look towards the galaxy plain, they are rewarded with rich star fields and dark nebulae (broad regions of opaque gas and dust). There is much to look at, but the congestion makes it difficult to see into the nucleus of the galaxy or beyond. Towards Ursa Major, the sky is relatively clear. It is possible to see extreme distances.

Astronomers use many measuring units for comparing distances. One of these units is the light year. Rather than a measure of time, it is the distance light travels in one year. A light year is about six trillion miles.

In the direction of Ursa Major, it is possible to see across billions of light years to the beginning of the Universe. The light issued from galaxies billions of light years away is just reaching us now and we see a picture of what they looked like when the light was released. This is similar to what happened in the early days of photography when a tintype of a family member was...
**Star Fact**
The second handle star (Use his Finger) of the Seven Brothers is actually a triple star. Also known as Mizar, it has a companion (Mizar B) and the two stars orbit each other. Mizar B requires a telescope to see. The third star is Alcor and can just be resolved as an individual star by people with sharp eyes. Alcor may or may not be gravitationally linked with Mizar and Mizar B.

taken and then mailed to a relative on another continent. It could take a year or more for the picture to arrive and when it did, it showed how the subject looked the year before. Looking deeply into space is looking back in time when the universe was young.

One common misconception about constellations is that the stars making them up are all the same distance from Earth as though they are arranged on the inside surface of a sphere (all stars equidistant from Earth). Rather, those seven stars are just chance alignments of stars at different distances.

**Starlab Demonstration:**
Ask for a student to point out the Seven Brothers in Starlab sky. Explain that the Seven Brothers is known by many names around the world. Also explain that the Seven Brothers is an asterism, that it is part of the much larger constellation Ursa Major or Big Bear. Use your pointer to outline the major stars of the Big Bear. Also, review the relationship of the Seven Brothers to the Fixed Star (North Star). The illustration on the first page of the activity identifies the stars in the Seven Brothers by their Blackfeet names. A list provides Arabic names for the same stars. Point out to your students that the stars in the Seven Brothers all appear at the same distance in the Starlab because they are projected on the inside of the dome. Ask them what they think the stars might look like if they could fly through space and see the Seven Brothers from different directions?

**Management Note:**
Two versions of this activity are provided. The basic build it activity is followed with additional information for an advanced version that provides just enough information for student teams to work it out for themselves.

The Hubble Space Telescope took this picture of an area near the handle stars of the Seven Brothers. It shows a region of the sky that would appear about the width of a dime held 75 feet away. Astronomers estimate this tiny part of the Blackfeet sky contains approximately 1,500 galaxies.
Tips:
• Glow-in-the-dark pony beads are available in craft stores or on-line.
• Old ceiling tiles from suspended ceilings can be use in place of the foam called for in the materials list but they are harder and messier to use. If using tiles, it will be necessary for students to use a nail to punch holes into the tiles for the stirrers.

Activity: Make a 3D Model of the Seven Brothers (Basic)
1. Have students work in teams of two. Tell them they are going to make a 3D (three-dimensional) model of the Seven Brothers. Give each team a pattern, foam rectangle, 4 coffee stirrers, 7 beads, scissors, and a ruler. Also prepare a place with several glue guns ready to be used.

2. Tell students to place the pattern over the foam and lightly puncture the paper with a pencil point to make a dent in the foam surface below. Each dent is where one of the stars in the Seven Brothers will be located.

3. Have teams cut the coffee stirrers to the lengths given on the pattern. The stirrers should be cut at an angle to make a sharp point so that is easier to insert the stirrer into the foam.

4. When each stirrer is cut, teams should go to the gluing station. A dab of glue is placed on the upper end of a stirrer. Before the glue cools, they should touch the end to a bead to attach it to the stirrer. Repeat this for all the stirrers.

5. When the glue has cooled, the pointed ends of the stirrers should be pushed into the foam in the places marked. It is important that sticks are pushed all the way to the bottom of the foam and that the sticks are straight up. If students make holes that are loose, a bit of glue will anchor them. Have them pull out the stirrer and place a small dab of glue to its end and then reinsert it into the foam. (Caution: The foam will melt if too much hot glue is used or if the glue is applied directly to the foam.)

6. Have teams examine their models from different directions. Can they see the Seven Brothers? (They should look at the stars from the direction of the arrow in the pattern.) Have them sketch the stars. Next, have them look at their model from the top and then the side. Each time, ask them to sketch the appearance of the stars.

7. Have teams bring their models into the Starlab planetarium. Use a bright light to shine on the models to get the beads glowing. Tell your students to close their eyes. Otherwise, most of the glow will fade while their eyes adjust to the darkness. Turn off their lights and have everybody open their eyes. What can they see? Why does the Seven Brothers pattern change when looking at the model from different directions?
The measurements show how long to cut the coffee stirers so that the beads are mounted at the correct height above the foam base. The little diagram to the left shows the relation of the pattern to the stars in the Seven Brothers Asterism.

**Approximate Distances in Light Years**

- **Bladder of Water** (93 ly)
- **Small Rock** (64 ly)
- **Short Sticks** (65 ly)
- **Bladder of Air** (76 ly)
- **Oo Kin Na** (86 ly)

**Marking Pattern**

- 1 3/4”
- 2 3/8”
- 2”
- 1 7/8”
- 1 1/2”

**Seven Brothers Asterism**

- **Bladder of Water**
- **Small Rock**
- **Short Sticks**
- **Bladder of Air**
- **Oo Kin Na**
Activity: Make a 3D Model of the Seven Brothers (Advanced)

1. Talk about how the appearance of constellations depends upon the direction from which you see the constellation. Stars that make up constellations are actually at different distances from Earth.

2. Organize the class into teams of two or three students each. Challenge them to create a 3D model of the Seven Brothers asterism. Provide teams with the chart below. The chart lists the seven stars in the Seven Brothers and gives three coordinates for each star. Right Ascension, Declination, and distance from Earth in light years. Discuss why three points are needed to fix the positions of the stars. In this activity, Earth is the point of origin. LY gives the distance of each star from Earth in light years. Right Ascension and Declination gives the east-west, north-south position.

3. Also give each team a copy of the Celestial Coordinate Chart. It shows the region where the Seven Brothers is located.

4. If desired, provide the same materials to the teams that are called for in the basic version of the model activity with the exception of the pattern. Teams will create their own pattern from the data table below. Show teams how to assemble a model from those materials. Preferably, let the teams decide for themselves what they will use for their models. If appropriate plotting software is available, teams could create their models on a computer. Teams should use their computer model as a guide for constructing a physical model. By doing so, they are following the same design process employed by industry in the creation of many consumer products.

5. When models are completed, take them into the Starlab Planetarium for viewing in a night sky environment. Refer to step 7 in the basic activity for details on how to view the models. Compare their models to the Seven Brothers as they appear on the dome.

<table>
<thead>
<tr>
<th>Blackfeet Star Name</th>
<th>Arabic Star Name</th>
<th>Designation</th>
<th>Magnitude</th>
<th>Distance LY</th>
<th>Right Ascension</th>
<th>Declination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oo Kin Na</td>
<td>Dubhe</td>
<td>α UMa</td>
<td>0.2</td>
<td>86</td>
<td>11h04m</td>
<td>61d45m</td>
</tr>
<tr>
<td>Beautiful Bird</td>
<td>Merak</td>
<td>β UMa</td>
<td>1</td>
<td>62</td>
<td>11h01m</td>
<td>56d23m</td>
</tr>
<tr>
<td>Bladder of Air</td>
<td>Phedca</td>
<td>γ UMa</td>
<td>0.6</td>
<td>76</td>
<td>11h54m</td>
<td>53d41m</td>
</tr>
<tr>
<td>Short Sticks</td>
<td>Megrez</td>
<td>δ UMa</td>
<td>1.9</td>
<td>62</td>
<td>12h15m</td>
<td>57d01m</td>
</tr>
<tr>
<td>Small Rock</td>
<td>Alioth</td>
<td>ε UMa</td>
<td>0.3</td>
<td>64</td>
<td>12h54m</td>
<td>55d57m</td>
</tr>
<tr>
<td>Use his Finger</td>
<td>Mizar</td>
<td>ζ UMa</td>
<td>1.4</td>
<td>69</td>
<td>13h24m</td>
<td>54d55m</td>
</tr>
<tr>
<td>Bladder of water</td>
<td>Alkaid</td>
<td>η UMa</td>
<td>-1.7</td>
<td>93</td>
<td>13h47m</td>
<td>49d18m</td>
</tr>
</tbody>
</table>

Tip: The concept of celestial coordinates may be challenging to your students. In addition to comparing them with latitude and longitude on Earth, take them into the Starlab and project the celestial coordinates in the sky. Have them practice identifying location using right ascension and declination.
STAR FACT
Right Ascension and Declination is a system of coordinates astronomers use for fixing the positions of stars and other objects in the sky as seen from Earth. It is similar to longitude and latitude for finding places on Earth. Declination is measured in degrees, and refers to how far above or below the Celestial Equator (extension of Earth’s equator into space) a star or object is. If you hold your arm straight out and move it up toward the ceiling, you are going “up” in declination (+). If you move your arm down and point toward the floor, you’re moving “down” in declination (-).

Parallel declination lines (like latitude lines), are measured in degrees beginning at the Celestial Equator (0). The celestial North Pole is +90 degrees and the Celestial South Pole is -90 degrees. Between the degree lines are smaller divisions called minutes. Each degree is divided into 60 minutes.

Right ascension measures the other part of a star’s position. If you hold your arm straight out and spin counterclockwise, your arm crosses lines of right ascension (like longitude lines on Earth). Right ascension is measured in hours of time. Zero hours is a north-south line that crosses through the constellation of Pisces (it is the place where the Sun is at noon on the first day of the northern spring). When you make a complete circle, your have crossed 24 hours of right ascension. Between each hour of right ascension are smaller divisions called minutes. Each hour is divided into 60 minutes. (Note: For more precise locating, each minute of R.A. and Dec. is further divided into 60 seconds.)
Assessment and Questions for Discussion

• Review the team models and compare them for accuracy and care in construction.
• Have students write short paragraphs explaining what they learned about the Seven Brothers from their model.

Why are the Seven Brothers easy to find in the night sky?
This region of the sky is not densely packed with other stars and the stars in the Seven Brothers are relatively bright stars, making them easy to pick out.

Extensions:
• Use the U Naval Observatory Portal site below to find the coordinates for a wide range of sky objects and use the coordinates to locate the objects in the Starlab.

Resources
A good description of stars in the Seven Brothers is found in this site. Click on individual star names to learn more about each one.
http://en.wikipedia.org/wiki/Big_Dipper

The US Naval Observatory provides right ascension and declination information for important sky objects. After opening the site, click on the Astronomy menu and go to Data Services. Look for Positions of Selected Celestial objects and click on Geocentric Positions of Major Solar System Objects and bright stars. The right ascension and declination coordinates can be found here. This site provides a wealth of astronomy data.
http://www.usno.navy.mil/astronomy

A-ne’ma-ye ek’ko tsis

Blackfeet Skies 55
The Blackfeet have a rich tradition of story telling. Originating long ago, their stories passed from generation to generation around lodge fires especially during long winter nights. Many of the stories relate to Spomi-tapi-kxi or Sky Beings. Although mythological in nature, Blackfeet sky stories continue to serve an important function in Blackfeet life.

We call ourselves Nitsitapii, although we are known as the Blackfoot. We have many stories of the Spomi-tapi-kxi who are part of our world and who have helped us and taught us many important lessons. The Spomi-tapi-kxi guide us on our journeys and define the seasons.

All beings must coexist to survive in the world. The Spomi-tapi-kxi stories are used to teach respect for all of life and to encourage peaceful coexistence. We have many stories about people who have died and become stars. These stories remind us of proper behaviors.

Introduction, by Chief Earl Old Person, for the Niitsitapiisini virtual on-line exhibit of the Canadian Glenbow museum.

Sitting around lodge fires night after night, Blackfeet children of old had to listen carefully to the stories told by their elders. The stories were told again and again and important lines and points in the stories were often repeated. The children had to learn the stories because one day, they would become the elders.

Hubble Space Telescope view of the Great Nebula in Orion. This is “smoking star” in Blackfeet star lore. The Great Nebula is a giant cloud of gas, dust, and debris and is a “nursery” for thousands of newly forming stars.
As people become increasingly technology oriented, stories and traditions of the past become neglected and ultimately forgotten. The potential cultural loss is immense. Fortunately a number of researchers have preserved Blackfeet stories in written form. One of these researchers was Clark Wissler. Clark Wissler (1870-1947) was an anthropologist from the American Museum of Natural History. From 1903 to 1907, Wissler spent many months living in log cabins in small towns across the northern Great Plains. With the assistance of translator D.C. Duvall, Wissler recorded and compiled Blackfeet myths. He was neither the first nor the last to do this. There are many compendiums of Blackfeet mythology including collections made by George Bird Grinnell, Francis Fraser, Cecile Black Boy, and Percy Bullchild. Thanks to Wissler, we have a representative collection of Blackfeet star stories (see Appendix).

Because the Old Ones did not have a written language, the exact form of the original stories is unknown. While individual story tellers were free to emphasize or diminish specific story details, the spirit of the stories themselves remained constant. An old man, a Blood Indian, explained this to Wissler and Duvall. He pulled up a common ragweed from the ground.

“The parts of this weed all branch off from the stem. They go different ways, but all come from the same root. So it is with the different versions of a myth.”

Blackfeet stories are looked upon as important tools for teaching children respect for their world and all life and for reminding children of proper behaviors.

The written collections of Blackfeet star stories are incomplete. Only a few of the northern sky constellations and objects are mentioned in the stories. We hear of the adventures of the Seven Brothers and Little Sister, the Six Brothers, Scarface, Moon Woman, Smoking Star, and a few others. However, there is much more in the northern sky that is not described, or at least collected by Wissler and others. Furthermore, references are not always clear. Smoking Star is probably the Great Nebula of Orion (a fuzzy patch in the sword of Orion) but it could be a comet. The Hand In The

Close-ups of the Bunched Stars taken by the Palomar 48 inch Schmidt Telescope (left) and the Spitzer (infrared) Space Telescope (right). These two views show the same sky region in visible and infrared radiation wavelengths.
Sky constellation mentioned in a story on the Skunk Tipi design, collected by Cecile Black Boy, is unknown although it may be the Spider Man’s Hand constellation (Hercules).

**Starlab Demonstration**
The star stories in the appendix in full or in abridged form make great listening in the Starlab Planetarium. Invite different students to learn the stories. As a guide to learning the stories, have your students create an outline listing the story characters and the sequence of events that take place. Have them practice telling the stories to someone else. It isn’t necessary for the stories to be told exactly as written and it is OK to shorten the longer ones as long as the sense of the story is retained. Gather your class inside the planetarium and dim the lights. As each story is told, point out the objects in the sky the stories are related to.

<table>
<thead>
<tr>
<th>Blackfeet Name</th>
<th>Common Blackfeet Name</th>
<th>Classical Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Li Ki tsika</td>
<td>Seven Brothers and their Sister</td>
<td>Big Dipper</td>
</tr>
<tr>
<td></td>
<td>Ashes Chief and Stuck Behind</td>
<td>Castor and Pollux, Gemini</td>
</tr>
<tr>
<td></td>
<td>Smoking Star</td>
<td>Great Nebula in Orion</td>
</tr>
<tr>
<td></td>
<td>Spider Man’s Fingers</td>
<td>Hercules</td>
</tr>
<tr>
<td>? (Son of Natosi)</td>
<td>Morining Star, Day Star</td>
<td>Venus</td>
</tr>
<tr>
<td></td>
<td>Young Morning Star, Mistaken for Morning Star</td>
<td>Jupiter</td>
</tr>
<tr>
<td></td>
<td>Big Fire Star, Big Fire Eater</td>
<td>Mars</td>
</tr>
<tr>
<td></td>
<td>Wolf Trail</td>
<td>Milky Way</td>
</tr>
<tr>
<td></td>
<td>Star that Stands Still, Fixed Star</td>
<td>Polaris, North Star</td>
</tr>
<tr>
<td></td>
<td>Lodge of the Spider Man</td>
<td>Corona Borealis</td>
</tr>
<tr>
<td></td>
<td>Bunchd Stars, Lost Children</td>
<td>Pleaides</td>
</tr>
<tr>
<td></td>
<td>Hand In Sky</td>
<td>?</td>
</tr>
<tr>
<td>Natosi</td>
<td>Creator Sun</td>
<td>Sun</td>
</tr>
<tr>
<td>Kokomikiisom (wife of Natosi)</td>
<td>Moon</td>
<td>Moon</td>
</tr>
</tbody>
</table>

**Activity**
1. Conduct a discussion on Blackfeet sky stories. Ask your class if anyone has heard stories told by a family member, such as a grandparent, or some other elder. What was the story about? Explain that the stories are an effective way for Blackfeet to pass beliefs from one generation to another.
2. Read aloud the story *The Moon Woman* (Francis Frasier version) and *The Moon Woman* (Clark Wissler version) in the Appendix. Compare the story as retold by the two sources. How are they the same (plot and major elements)? How are they different? Ask your students to speculate on why there are two versions of the story.
3. Have each of your students create their own star story. The story can be about any event, small or large, real or made up. The story can take place in the past, present, or future. The story needs a main character (human or other animal) and should begin or end with an object in the sky. Finally, the story should be about 200 to 300 words long (about 1 page typed). Ask students to add an illustration to the story. The illustration can be realistic or symbolic (like the sky symbols used for tipi painting).
4. If some students are having trouble coming up with ideas, provide story starters like the ones below.
5. When the stories are completed, assign each student a partner. Have the partners read their stories word-for-word to each other. Tell your students that they need to remember the story they are told.
6. Wait a day and have each student write down the story they were told by their partner the day before. When finished, pick volunteers to read their stories word-for-word. Start with a story written from memory. Follow the memory story with the original story.
7. Ask your class to compare the two versions. How are they different and how are they similar? Pick more volunteers to read their stories.
8. After comparing several stories, discuss the challenge of preserving sky stories from one generation to another. Ask your students to explain the significance of the following: The parts of this weed all branch off from the stem. They go different ways, but all come from the same root.
9. Post all the stories on a bulletin board so that original and memory stories can be compared and enjoyed.

**Story Starters**
- While an old woman was picking berries, a great storm came up and....
- A Blackfoot astronaut, walking on the moon, spied a shiny pebble and....
- A fox pup, with a misshaped leg, was driven out of the den by his brothers and sisters....
- A Blackfoot astronomer was alone in the observatory when....
- A falling star landed on the ground near a young girl....
- Two brothers were walking along a river bank looking for a missing horse....
- A girl was collecting different kinds of grass for a science project when....
- While coming home after dark, a boy observed a growing shadow on the full Moon....

**Assessment and Questions**
- Collect and review student stories.
- Do you think it is important for Blackfeet to memorize sky stories now that they can be written or recorded?
- What kind of sky stories would the Blackfeet of old have told had they had telescopes to look at the night sky with?

**Extensions**
- Invite a Blackfeet story teller to your class.
- Have students to ask their elders (family or friends) if they know any Blackfeet star stories. If they do, ask them to record the story to share with the class.

**References**
The Glenbow Museum in Calgary, Alberta has an excellent virtual exhibit on the Blackfeet nation. The exhibit text is available in the Blackfeet language along with English and French. http://www.glenbow.org/blackfoot/


Fraser, Frances ,1990, The Bear Who Stole the Chinook, Douglas and McIntyre.
McClintock, Walter, 1999, The Old North Trail, Life, Legends And Religion of the Blackfeet Indians, University of Nebraska Press. (Chapters 17 and 18)

Miller, Dorcas, 1997, Stars of the First People, Native American Star Myths and Constellations, Blackfeet Skies
Pruette Publishing Company. (pp 243-255)


Wissler, Clark and Duvall, D.C., 1995, Mythology of the Blackfoot Indians, University of Nebraska Press.

\textit{A-ne’ma-ye ek’ko tsis}
The story telling tradition of the Blackfeet tribe is ancient. Passed from generation to generation, Blackfeet stories blend the supernatural with the natural and speak of the continuity and value of all life. Described as mythology by some, Blackfoot stories are perhaps better described as legendary history.

Thanks to the willingness of Blackfeet elders to share their stories and the efforts of others to interpret and record them, a great collection of stories has survived to the present. The stories that follow here relate to the nighttime sky. They speak of the Sun, Moon, planets, and principal stars and explain important concepts, such as why one star remains fixed while all others circle about it.

While this collection includes many star stories, it is not definitive. Some Blackfeet star stories may have have been lost to time while others were simply not shared with interpreters. It is further likely that portions of the stories presented here were altered and generalized in the interpretation process to merge variations that inevitably come from different storytellers.

Each story each explains an important part of the living Blackfeet culture and star lore. The source of each story interpretation is identified after the title and full references are found at the end.
In a camp of our people there was a family of six boys. Their parents were very poor. Every spring the people went out to hunt for buffalo. At this time of year, the buffalo calves are red, and their skins are much desired for children’s robes. Now as the parents of these children were very poor and are not able to do much hunting, these boys had to wear brown robes or those made of old buffalo skins. As the children grew up, they were constantly reminded that they had no red robes. The other children of the camp sometimes made fun of them because of this. So one day one of the boys said to his brothers “Why is it that we never get any red robes? If we do not get any next spring, let us leave the camp and go up into the sky.” Then the boys went out to a lonely place to talk the situation over. Finally they agreed that, if they did not get red robes the following spring, they would go up to the sky country. The spring hunting-season passed, but no red robes came to the boys. Then the oldest brother said, “Now I shall take you all up to the sky.” The fourth brother said, “Let us also take all the water away from the people, because they have been bad to us.” Another brother said, “We must take our dogs with us.”

Then the oldest brother took some weasel-hair, placed a little on the backs of his brothers and upon their dogs. Then he took another bunch of hair, put it first in his mouth, then rubbed it on his palm. “Now shut your eyes,” he said. Then he blew the weasel-hair up, and, when the brothers opened their eyes, they found themselves in the house of the Sun and Moon. The Sun, who was an old man, and the Moon, who was his wife, said, “Why have you come?” “We left the earth,” said the oldest brother, “because the people never gave us red robes. All the other children had red robes to wear, but we only had brown ones. So we have come for your help.” “Well,” said the Sun, “what do you want?” The fourth brother said, “We should like to have all the water taken away from the people for seven days.” Now the Sun made no answer to this; but the Moon took pity on the poor boys and said, “I will help you; but you must stay in the sky.” The Moon pitied the boys so much that she cried. She asked the Sun to aid her in taking away the water from the people; but the Sun made no answer. She asked him seven times. At last he promised to aid her.

The next day on the earth was very hot. The water in the streams and lakes boiled, and in a short time it all evaporated. The next night was very warm and the moonlight strong. When the water was gone, the people in the camp said, “Let us take two dogs with us to the river bed.” When they came to the bank of the river, the two dogs began dig a hole in the side of the bank. When they had dug a long time, water came out of the hole like a spring. This is the way springs were made. Even to this day, people have great respect for their dogs because of this. The days were so hot, the people were so hot the people were forced to dig holes into the hills and crawl into them. They would have died if they would have remained on top if the ground. When the water in the springs gave out, the dogs made other springs. Now the leader of the dogs was a medicine dog. He was old and white. On the seventh day he began to howl and look at the sky. He was praying to the Sun and Moon. He explained to the Sun and Moon why it was that the boys got no red robes. He asked them to take pity on the dogs below. (This is why dogs sometimes howl at the moon.) On the eighth day the Sun and Moon gave people rain. It was a great rain, and it rained for a long time. The six boys remained in the sky, where they may be seen every night. They are the Bunched Stars (Pleiades).

A-ne’ma-ye ek’ko tsis
The Seven Stars

Clark Wissler, D.C. Duvall, pp. 68-70.
Tells the story of the Big Dipper.

Once there was a young woman with many suitors; but she refused to marry. She had seven brothers and one little sister. Their mother had been dead many years and they had no relatives, but lived alone with their father. Every day the six brothers went out hunting with their father. It seems that the young woman had a bear for her lover, and, as she did not want anyone to know this, she would meet him when she went out after wood. She always went after wood as soon as her father and brothers went out to hunt, leaving her little sister alone in the lodge. As soon as she was out of sight in the brush, she would run to the place where the bear lived.

As little sister grew older, she began to be curious as to why her older sister spent so much time getting wood. So one day she followed her. She saw the young woman meet the bear and saw that they were lovers. When she found this out, she ran home as quickly as she could, and when her father returned she told him what she had seen. When he heard the story he said, "So my elder daughter has a bear for a husband, Now I know why she does not want to marry." Then he went about the camp, telling all his people that they had a bear for a brother-in-law, and that he wished all the men to go out with him to kill this bear. So they went, found the bear, and killed him.

When the young woman found out what had been done, and that her little sister had told on her, she was very angry. She scolded her little sister vigorously, then ordered her to go out the dead bear, and bring some flesh from his paws. The little sister began to cry, and said she was afraid to go out of the lodge, because a dog with young pups had tried to bite her. "Oh, do not be afraid!" said the young woman. "I will paint your face like that of a bear, with black marks across the eyes and at the corners of the mouth; then no one will touch you." So she went for the meat.

The little sister was a powerful medicine-woman. She could tan hides in a new way. She could take up a hide, strike it four time with her skin-scraper and it would be tanned.

The little sister had a younger brother that she carried on her back. As their mother was dead, she took care of him. One day the little sister said to the older sister, "Now you be a bear and we will go out in to the bush to play." The older sister agreed to this, but said, "Little sister, you must not touch me over my kidneys." So the big sister acted as a bear and they played in the brush. While they were playing, the little sister forgot what she had been told, and touched her sister in the wrong place. At once she turned in to a real bear, ran in to camp and killed a large number of the people. After she had killed the people, she turned back in to her former self. Now when the little sister saw the older sister run away as a real bear, she became frightened, took up her little brother and ran into their lodge. Here they waited, badly frightened, but were very glad to see their older sister return after a time as her true self.

Now the older brothers were out hunting as usual. As the little sister was going down for water with her little brother on her back, she met her brothers returning. The brothers noted how quiet and deserted the camp seemed to be. So they said to their little sister, "Where are all our people?" Then the little sister explained how she and her sister were playing when the elder one turned in to a bear, ran through camp and killed many people. She told her brothers they were in great danger, as their sister would surely kill them when they came home. So the six brothers decided to go into the brush. One of them had killed a jackrabbit. He said to his little sister, "You take this rabbit home with you. When it is dark, we will scatter prickly pears all around the lodge, except one place. When you come out, you must look for that place, and pass through."

When the little sister came back to the lodge, the elder sister said, "Where have you been all this time?" "Oh, my little brother mussed himself and I had to clean him," replied the little sister. "Where did you get that rabbit?" she asked. "I killed it with a sharp stick," said the little sister. "That
is a lie. Let me see you do it,” said the older sister. Then the little sister took up a stick lying near her, threw it at the rabbit and it stuck in the wound in his body. “Well, all right,” said the elder sister. Then the little sister dressed the rabbit and cooked it. She offered some of it to her older sister, but it was refused; so the little sister and her brother ate it. When the elder sister saw that the rabbit had all been eaten, she became very angry, and she said, “Now I have a mind to kill you.” So the little sister arose quickly, took her little brother on her back, and said, “I am going to look for wood.” As she went out, she followed the narrow trail through the prickly pears and met her six brothers in the brush. Then they decided to leave the country, and started off as fast as they could go.

The older sister, being a powerful medicine woman, knew at once what they were doing. She turned herself into a bear. The prickly pears stopped her for a time but at last she found the trail and started in pursuit. Soon she was about to overtake them, when one of the boys tried his power. He took a little water in the hollow of his hand and sprinkled it around. At once it became a great lake between them and the bear. Then the children hurried in while the bear went around. After a while the bear caught up with them again, when another brother threw a porcupine tail (a hair brush) on the ground. This became a great thicket; but the bear forced her way through, and again overtook the children. This time the all climbed a high tree. The bear came to the foot of the tree and looking up at them, said; “Now I shall kill you all.” So she took a stick form down on the ground, threw it in to the tree and knocked down four of the brothers. While she was doing this, a little bird flew around the tree calling out to the children, “Shoot her in the head! Shoot her in the head!” Then one of the boys shot an arrow in to the head of the bear, and at once she fell dead. Then they came down from the tree.

Now the four brothers were dead. The little brother took an arrow, shot it straight up into the air, and when it fell one of the dead brothers came to life. This he repeated until all were alive again. Then they held council, and said to each other, “Where shall we go? Our people have all been killed, and we are a long way from home. We have no relatives living in the world.” Finally they decided that they preferred to live in the sky. Then the little brother said, “Shut your eyes.” As they did so, they all went up. Now you can see them every night. The little brother is the North Star. The six brothers and the little sister are seen in the Great Dipper. The little sister and the eldest brother are in a line with the North Star, the little sister being nearest it because she used to carry her little brother on her back. The other brothers are arranged in order of her age, beginning with the eldest. This is how the seven stars (Ursa Major) came to be.

A-ne’ma-ye ek’ko tsis
Fixed Star

The story of how the North Star or Polaris came to be.

One summer night when it was too hot to sleep inside the lodge, two young women went outside to sleep. They woke up before daylight and were looking up at the sky, when one of them saw the Morning Star. She said to her companion, “That is a very bright star. I should like him for a husband.” She soon forgot what she had said. In a few days these two young women went out from the camp to gather wood. When they had made up their packs and were drawing them up on their shoulders with the pack straps, the strap broke that belonged to the girl who said she wanted the star for a husband. Every time she made up her bundle and raised it to her back, the strap would break. Her companion, who was standing by her side with her pack on her shoulders, began to grow weary. She said, “I shall go on with my load; you can follow.”

When the young woman was left alone and had made up her bundle again, a handsome young man came out of the brush. He wore a fine robe made of beaver skins, and had an eagle plum in his hair. When the young woman started to go on, he stepped in front of her. Whichever way she turned, he headed her off. Finally she said to him, “Why do you head me off?” The young man replied, “You said you would take me for your husband.” “No,” said the young woman, “you must be mistaken. I never had anything to do with you. I do not know you.” “I am the Morning Star,” said the stranger, “and one night, when you looked up at me, you said that you wished me for a husband. Now I have come for you.” “Yes I did say that,” said the young woman. So she consented to go away with him. Then Morning Star put an eagle plum in her hair, and told her to shut her eyes. Then they went up in to the sky.

Now the Sun was the father of the Morning Star and the Moon was his mother. When they came in to the lodge, Morning Star said to his parents, “I have brought a wife with me.” The parents were pleased with what their son had done. Moon gave the young wife four berries and a few drops of water in a little shell. These were given to her to eat and drink. Though the young woman was very hungry, she could neither eat all the berries nor drink all the water, because the berries stood for all the food there was in the world and the shell symbolized all the water there was in the ocean.

After a time, Moon said to her daughter-in-law, “Now I shall give you a root digger, and you may go out to dig roots; but you are not to dig that big turnip there because it is sacred.” So the young woman went about the sky country digging roots for their food. She often looked at the fine large turnip growing there and was curious to know why she was forbidden to dig it up. In the course of time she gave birth to a child. One day, when it was old enough to sit alone, she said to herself as she went out to dig roots, “Now no one will know about it if I dig it up.” So she stuck her digging stick in to the ground under the turnip; but, when she tried to raise it, the stick would not move. When she found that she could not get the stick out, she began to cry. Then two large white cranes flew down; one was a male and the other a female. The young woman prayed to them for help to get her root digger out of the ground. Then the Crane Woman said, “When I married I was true to my vow. I never had anything to do with any other man than my husband. It is because of this that I have the power to help you. Your mother gave you this digging stick. Now I shall give you the songs that go with it.” Then the Crane Woman burned incense, took the hands of the woman in to her own, and while she sang the songs, placed them on the digging stick. Crane Woman pulled out the stick, and marching around in the direction of the sun, made three movements towards the turnip, and with the fourth dug it out. Now the young woman took the digging stick and the turnip home with her. When her family saw what she had, the reprimanded her. Morning Star said to her, “What did you see when you dug out this turnip?” The woman replied, “I looked down through the hole and saw the earth, the trees, the rivers, and the lodges of my people.”
“Now,” said Morning Star, “I cannot keep you any longer. You must go back to your people; but when you get there you must not let him touch the ground for two-seven (fourteen) days. If he should touch the ground before that time, he will become a puffball (fungus) and go up as a star, and fit into the hole from which you dug the turnip. He will never move from that place, like the other stars, but will always be still.”

Sun said to her “I will call a man to help you down to the earth.” After a while a man came with a spider web. He tied the woman and boy to one end and let them down through the hole she had taken the root out of. The woman came down over the camp of her own people. Some young men were playing the wheel game. One of them looked up and saw her. This young man had bad eyesight, and when he told the other boys he saw something coming down from the sky, and seeing nothing they made sport of him. As he still insisted they, in derision, threw dirt into his eyes. After a while they too saw something. As the woman reached the ground in the center of camp, some one, recognizing her, called out, “Here is the woman who never came back with her wood.” Then all her friends came out to meet her and her mother took her home. Now, before she had left the sky, Morning Star had told her that because she made a mistake by digging up the turnip she would probably make another by letting their child touch the ground. He instructed her to paint the sign of the morning star on the back of her tipi, so she daily could be reminded of her duty. (All tipi doors then were facing the sun, so the morning star on back was always at the backside of the lodge.)

The woman kept a tight watch over her son for thirteen days, but on the fourteenth day her mother sent her out to get water. The grandmother was not as watchful because she didn’t understand the importance of not letting the boy touch the ground. When she turned he back, he crawled on the ground, and she grabbed him quickly and put him back on the bed. This seemed to make him angry because he pulled the robe over himself. The grandmother paid no more attention to him.

Now when the boy’s mother came back, she looked around and said, “Where is my child?” “Oh, he’s covered himself up with the robe,” said the grandmother. The young mother rushed to the bed, pulled the robe back, and found nothing but a puffball. She picked it up and carried it with her all the time.

That night when the stars came out, she looked up in to the sky. A new star had appeared where the hole had been from the turnip. She then knew for sure what had become of her child. This is the way the Fixed Star came to be.

After this, the woman painted circles around the bottom of the lodges to represent the puff balls or the fallen star (the one that came to earth) she had already painted the morning star on the back of her lodge. This is why people paint their lodges the way they do. This is also where we got the root digger from, as well as the turnip. Crane Woman taught her the songs that go with them and their use in the sun dance. This was the beginning of the sun dance medicine woman.

Many years after, this woman, while holding he sun-dance, mad another mistake. She took some of the offerings from the sun lodge. When she did this, she died.

\[A-ne\-'ma-ye ek\-'ko ts\-is\]
Moon And the Seven Singers

Francis Frasier pp. 112-115.
Another story of the Big Dipper.

It was a long, long time ago, the Old Ones say, when the Sky People were somehow much closer to the Blackfoot than they are now, when the High Gods concerned themselves more with the affairs of men.

For many moons, the buffalo had gone from the prairie and the Indian people were starving. One by one the old people had gone away out alone on the prairie to die, knowing that while they remained in the camp the tiny store of food would be shared with them. Mothers wept for their children who lay in the ragged lodges, too weak to now even cry. Day to day, hunters went out in frantic search for food. They came back empty handed, or with only a few tiny birds, or some small, poor animal.

One the hunters was a young man, a warrior named Moon Eagle. He was younger than the others and they paid little attention to him. When the others had tried all their hunting skills and invoked all their medicine powers in vain, they asked Moon Eagle, “What is it that pities you?”

He said, “I am pitied by eagles.”

The other hunters said, “The eagle sees everywhere. Perhaps he sees the buffalo. Do you have pity for the children?”

Moon Eagle said, “I have great pity for the children. I will go.”

He went away by himself out on the prairie to sacrifice to the Sky People and to pray for help. He cut off the ends of his fingers, and called the eagle, his medicine power, to come for his sacrifice. After some days, weak from thirst, hunger, and the loss of blood, he had a medicine dream, and the eagle came.

In his dream vision, the eagle ordered him to go to a certain place near the river where he would find a large rock with hollow place on the top of it. In the depression he would find the skeleton of an eagle. He was to take the wing bones and build a fire over the rest of the bones. He would let the fire die down, then build it up again four times, and on each fire he was to burn sweet grass. During this time he was to fashion a bone whistle as the eagle directed.

Moon Eagle hastened top find the rock and do as he had been directed. When the fire had burned low enough for the fourth time the whistle was completed. Moon Eagle put it to his lips and blew. The first time he blew the whistle, the moon disappeared from the sky. Seven times more he blew it, and when the echo of the seventh had dies away, he heard a strange, beautiful song. It drifted on the night wind, and to his mind came all the lovely sounds he knew—the wind in the trees, and birds singing, and little rivers running, and the laughter of children. And somewhere in it, a long way off, the weird, wild howl of wolves.

The singing came closer, and he saw, walking slowly toward him over the prairie, a beautiful girl dressed in strange, lovely feathered robes. A sparkle like sunlight on water glinted on her smooth braids and her feet in moccasins were ornamented like the wings of birds. She was followed by seven singers dressed in the same way, each carrying a small, ornamented drum.

“You called us,” she said. “What do you want?”

“My people are starving,” said Moon Eagle. “Give me food for them.”

“Give me the whistle,” she said.

She blew the whistle four times, then handed it to the first of the singers. He blew it and gave it to the next in line. Four times the whistle was passed down the line of the singers, and as each man blew it for the fourth time, he turned into a large wolf.

“Bring me buffalo!” the girl commanded, and the singer-wolves raced away across the prairie. Soon Moon Eagle heard the sound of many running hoofs.
“Your people will have food now,” said the girl, smiling. Then she took the whistle again and blew it four times. The seven wolves came running to hear, and as they came the stars in the sky grew very bright. The Wolf Road, that pathway of stars the white man calls the Milky Way, swung around, and one end of it came down to touch the ground where they stood.

“Who are you?” cried Moon Eagle.

“I am the Moon,” said the girl. My singers are the Seven Wolves.” Then she turned and, followed by the Seven Singer, went back up the Wolf Road into the Sky Country.

The Moon and the Seven Wolves - the stars of the dipper - shown brightly in the sky again. Moon Eagle summoned his people to the hunt, and the long famine was over. He kept the bone whistle, and though never attain could anyone call down the Sky People with it, it was used for many years in the rituals of our tribe.

*A-ne’ma-ye ek’ko tsis*
Blood Clot or Smoking Star

Clark Wissler, D.C. Duvall, pp. 53-58.
Tells of the Great Nebula in the constellation of Orion.

Once there was an old man and woman whose three daughters married a young man. The old people lived in a lodge by themselves. The young man was supposed to hunt buffalo, and feed them all. Early in the morning the young man invited his father-in-law to go out with him to kill buffalo. The old man was then directed to drive the buffalo through a gap where the young man stationed himself to kill them as they went buy. As soon as the buffalo were killed, the young man requested his father-in-law to go home. He said, “You are old. You need not say here. Your daughters can bring you some meat.” Now the young man lied to his father-in-law; for when the meat was brought to his lodge, he ordered his wives not to give meat the to the old folks. Yet one of the daughters took pity on her parents, and stole meat for them. They way in which she did this was to take a piece of meat in her robe, and as she went for water drop in in front of her father’s lodge.

Now every morning the young man invited his father-in-law to hunt buffalo and, as before, sent him away and refused to permit his daughters to furnish meat for the old people. On the fourth day the old man saw a blood clot laying in the path and said to himself, “Here at least, is something from which we can make soup.” In order that he might not be seen by his son-in-law he stumbled and spilled his arrows out of his quiver. Now, as he picked up the arrows, he put the clot of blood in to the quiver. Just then the young man came up and demanded to know what it was he picked up. The old man explained that he had just stumbled and was picking up his arrows. So the old man took the clot of blood him and requested his wife to make blood soup. When the pot began to boil, the old woman heard a crying child. She looked all around, but saw nothing. Then she heard it again. This time it seemed to be in the pot. She looked in quickly, and saw a boy baby; so she lifted the pot from the fire, took the baby out and wrapped it up.

Now the young man, sitting in his lodge, heard a baby crying, and said, “Well, the old woman must have a baby.” Then he sent his oldest wife over to see the old woman’s baby, saying, “If it’s a boy, I will kill it.” The woman came in to look at the baby, but the old woman told her it was a girl. When the young man heard this, he did not believe it. So he sent each wife in turn; but they all came back with the same report. Now the young man was greatly pleased, because he could look forward to another wife. So he sent over some old bones, that a soup might be made for the baby. Now, all this happened in the morning. That night the baby spoke to the old man saying, “You take me and hold me against each lodge pole in succession.” So the old man took up the baby, and beginning at the door, went around in the direction of the sun, and each time that he touched a pole, the baby became larger. When halfway around, the baby was so heavy that the old man could hold him no longer. So he put the baby down in the middle of the lodge, and taking hold of his head, moved it towards each of the poles in succession, and when the last pole was reached, the baby had become a fine young man. Then this young man went out and got some black flint (obsidian) and, when he returned to the lodge, said to the old man, “I am the Smoking Star. I came down to help you. When I have done this, I shall return to the sky.”

Now, when morning came, Blood Clot (the name his father gave him) arose and took his father out to hunt. They had not gone far when they killed a scabby cow. Then Blood Clot lay down behind the cow and requested his father to wait until the son-in-law came to join him. He also requested that he stand his ground and talk back to the son-in-law. Now, at the usual time in the morning, the son-in-law called at the lodge of the old man, but was told that he had gone out to hunt. This made him angry, and he struck at the old woman saying, “I have a notion to kill you.” So the son-in-law went out.
Blood Clot had directed his father to be eating a kidney when the son-in-law approached. When the son-in-law came up and saw all this, he was angry. He said to the old man, “Now you shall die for all this.” “Well,” said the old man, “you must die too, for all that you have done.” Then the son-in-law began to shoot arrows at the old man, and the latter, becoming frightened, called on Blood Clot for help. Then Blood Clot sprang up and upbraided the son-in-law for this cruelty. “Oh,” said the son-in-law, “I was just fooling.” At this Blood Clot shot the son-in-law through and through.

Then Blood Clot said to his father, “We will leave this meat here, it is not good. Your son-in-law’s house is full of dried meat. Which one of your daughters helped you?” The old man told him it was the youngest. Then Blood Clot went to the lodge, killed the two older women, brought up the body of the son-in-law, and burned them together. Then he requested the younger daughter to take care of her old parents and to be kind to them. “Now,” said Blood Clot, “I shall go to visit other Indians.”

So he started out, and finally came to a camp. He went into the lodge of some old women who were surprised to see such a fine young man. They said, “Why do you come here among such old women as we? Why don’t you go where there are young people?” “Well,” said Blood Clot, “give me some dried meat.” Then the old women gave him some meat but no fat. “Well,” said Blood Clot, “you did not give me the fat to eat with my dried meat.” “Hush!” said the old women. “You must not speak so loud. There are bears here that take all the fat and give us the lean, and they will kill you, if they hear you.” “Well,” said Blood Clot, “I will go out tomorrow, do some butchering, and get some fat.” The he went through the camp, telling all the people to make ready in the morning, for he intended to drive the buffalo over (the drive).

Now there were some bears who ruled over this camp. They lived in a Bear Lodge (painted lodge) and were very cruel. When Blood Clot had driven the buffalo over, he noticed among them a scabby cow. He said, “I shall save this for the old women.” Then the people laughed and said, “Do you mean to save that poor old beast? It is too poor to have fat.” However, when it was cut open it was found to be very fat. Now, when the bears heard the buffalo go over the drive, they usually sent out two bears to cut off the best meat, especially all the fat; but Blood Clot had already butchered the buffalo, putting the at upon sticks. He hid it as the bears came up. Also he had heated some stones in a fire. When they told him what they wanted, he ordered them to go back. Now the bears were angry, and the chief bear and his wife came up to fight, but Blood Clot killed them by throwing hot stones down their throats. Then he went down to the lodge of the bears and killed all, except one female who was about to become a mother. She pleaded so pitifully for her life, that he spared her. If he had not done this, there would have been no more bears in the world. The lodge of the bears was filled with meat and other property. Also all the young women of the camp were confined there. Blood Clot gave all the property to the old women, and set free all the young women. It was a bear painted lodge.

“Now,” said Blood Clot, “I must go on my travels.” He came to a camp and entered the lodge of some old women. When the women saw what a fine young man he was, they said, “Why do you come here, among such old women? Why do you not go to where there are younger people?” “Well,” said he, “give me some meat.” The old women gave him some dried meat, but no fat. The he said, “Why do you not give me some fat with my meat?” “Hush!” said the women, “you must not speak so loud. There is a snake lodge here, and the snakes take everything. They leave no fat for the people.” “Well,” said Blood Clot, “I will go over to the snake lodge to eat.” “No, you must not do that,” said the old women. “It is dangerous, they will surely kill you.” “Well,” said he, “I must have some fat with my meat, even if they do kill me.” Then he entered the snake lodge. He had his white rock knife ready. Now the snake, who was the headman in this lodge, had one horn on his head. He was lying with his head in the lap of his beautiful woman. He was a sleep. By the fire was a bowl of berry soup ready for the snake when he should wake. Blood Clot seized the bowl and drank the soup. Then the woman warned him in whispers, “You must go away: you must not stay here.” But he said, “I want to smoke.” So he took out his knife and cut off
the head of the snake, saying as he did so, “Wake up! light the pipe! I want to smoke.” Then with his knife he began to kill the other snakes that are in the world. Now the lodge of the snakes was filled up with dried meat of every kind and fat. Blood Clot turned all this over to the people, the lodge and everything it contained. Then he said, “I must go away and visit other people.”

So he started out. Some old women advised him to keep on the south side of the road, because it was dangerous the other way. But Blood Clot paid no attention to their warning. As he was going along, a great windstorm struck him and at last carried him to the mouth of a great fish. This was a suckerfish and the wind was it sucking. When he got in to the stomach of the fish, he saw a great many people. Many of them were dead, but some were still alive. He said to the people, “Ah, there must be a heart somewhere here. We will have a dance.” So he painted his face white, his eyes and mouth with black circles, and tied a white rock knife on his head, so that the point stuck up. Some rattles made of hooves were also brought. Then the people started to dance. For a while Blood Clot sat making wing motions with his hands, and singing sings. Then he stood up and danced, jumping up and down until the knife on his head struck the heart. Then he cut the heart down. Next he cut through between the ribs of the fish, and let all the people out.

Again Blood Clot said he must go on his travels. Before starting, the people warned him, saying that after a while he would see a woman who was always challenging people to wrestle with her, but he must not speak to her. He gave no heed to what they said, and after he had gone a little was, saw a woman who called him to come over. “No,” said Blood Clot. “I am in a hurry.” However, at the fourth time the woman asked him to come over, he said, “Yes, but you must wait a little while, for I am tired. I wish to rest. When I have rested, I will come over and wrestle with you.” While he was resting, he saw many large knives in the ground hidden by straw. He then knew that the woman would kill the people who wrestled her by throwing them on to the knives. The woman called him over to the area by the knives but he wouldn’t go. “I’m not ready but I’ll play a bit before we start.” The woman agreed and they began to play and then he threw her on to the knives and cut her in two.

Blood Clot took up his traveling again. He came to a camp and there were some old women who warned him about a woman on a swing ahead. They warned him that he must not swing with her. Well after a while, he came to the swinging woman. He watched her and soon saw that she killed people by swinging with them and dropping them over the water. He then went to her and said, “You have a swing here, let me see you swing.” “Well” said the woman, “I shall swing and then watch you do it.” He said to the woman, “You swing again while I get ready.” As she swung out over the stream, he cut the vine and let her fall.

“Now,” Blood Clot said, “I have rid the world of monsters, I will go back to my mother and father.” So he returned to the old couple. One day he told them he was going back to the plains that he came from. “If you find that I am dead, do not be sorry, look up in to the sky and I will become the Smoking Star” Then he left, and was eventually killed by a war party of Crow Indians. His body was never found, but at the same time he died, the Smoking Star appeared in the sky where it is now.

\textit{A-ne'ma-ye ek'ko tsis}
Once there was a poor young man that lived with his sister. He had a chum. In the camp there was a very fine girl, the daughter of a chief, whom all the young men were in love. Now the poor young man was in love with her also, but he had a long, ugly scar on his cheek. One day he asked his sister to go to the chief’s lodge and persuade his daughter to marry him. Accordingly, the sister went over; but when the girl found out what she wanted, she was willing to marry Scar-Face whenever that ugly scar disappeared. She made all manner of fun of Scar-Face.

Now the sister returned and told Scar Face what the girl had said. He was very much hurt, and decided to go away to seek some one who could aid him in removing the scar. Yet, though he traveled far, no one could tell him where to go for aid. At last he decided to go to the Sun. So he travelled on and on, and the farther he went, the blacker the people became. As he went along, he inquired for the Sun’s house. Always he was told to go on until he came to a very high ridge where some people lived who could tell him the whereabouts of the Sun’s house. At last Scar-Face came to this ridge. There he saw a nude man with very black skin and curly hair. Scar-Face called to him, “Where is the Sun’s lodge?” “It is at the end of this ridge,” said the black man. “But go back! go back! You will be burned very badly!” Scar-Face said, “Well, I shall go on anyway; it is better to die than to go back.” “Look at me!” said the black man. “You can see how I have been burned black. You had best take my advice and go no farther.” “Where do you live?” asked Scar-Face. “I have a cave to live in,” replied the black man. “I stay in this cave when the sun is hot, otherwise I should be burned up.” (It was just about sundown that Scar-Face met the black man.) The black man advised him to travel only at night.

Now Scar-Face went on towards the place where the Sun lived. Presently he saw a young man standing alone. The young man called to Scar-Face, “Where are you going?” “I am going to the Sun,” said Scar-Face. “Oh!” said the young man. “Sun is my father, this is his house.” (This young man was Morning Star.) “My father is not a good man. He is not at home now, but when he comes in the morning he will surely kill you. However, I will talk with my mother, who is a good woman and will treat you kindly.” Then Morning Star took Scar-Face up to his father’s lodge, and addressed his mother, saying “Mother, I have brought a strange young man here. I wish him for a companion. He has come a long way to find us, and I wish you would take pity on him, that I may enjoy his company.” “Well,” said his mother, “bring him in. We will talk to your farther when he returns; but I fear we shall not be able to keep the young man.”

When Scar-Face was taken into the lodge, he saw on the ground a kind of earthen square, some cedar-brush, and buffalo-chips. This was the Sun’s smudge-place. After a time he old woman, who was Moon, said to Scar-Face, “Is there anything that you especially care for?” “Yes,” answered Scar-Face, “I want this scar taken from my face.” “Well,” replied Moon, “it is about time for my husband to come in. If he take pity on you - well, we shall see.” In a little while Moon said, “Now he is coming.” Then she took Scar-Face to one side of the lodge and covered him up with cedar. Now Scar-Face began to feel very warm, because Sun was approaching. He began to shift about under the cedar, but Moon whispered that he must be quiet. So he lay very still, but became very hot as Sun came up. Finally Moon said to Scar-Face, “Now Sun is at the door,” Sun looked into the lodge and said, “Oh my, this lodge smells bad.: “Yes,” Moon replied. “Morning Star has a chum here.” “Well,” said Sun, “make a smudge with cedar.”

After this had been done, Sun entered the lodge. Now Scar-Face was very hot. Finally Sun said, “Where is that young man?” “We covered him up,” said Moon. “Come,” said Sun, “get up.” Then Scar-Face came out from the cedar. He could not look Sun in the face. As Sun looked
upon him, he knew that this was a poor unfortunate boy, and took pity on him. The heat then grew gradually less.

Now it seems that Morning Star was out on one of his journeys, and Sun waited for his return. When Morning Star came into the lodge and sat down in his usual place, Sun addressed him saying, “My son, do you wish this young man for a companion?” Then Morning Star said that he did very much, as he wished for a companion to go about with him. He was lonesome on his journeys. “Well,” said Sun, “you must make a sweat house.” Then Morning Star went out and prepared a sweat-house. When all was ready, Sun went out. He had a disk of metal at the back of his head. This disk looked like brass. Then Sun went into the sweat-house and began to wipe off the metal disk. Then he brought Morning Star and Scar-Face into the sweat-house. When they were in, the covers were closed down. At last, when all was ready, the covers were raised and the light let in. The two boys now looked alike.

Now, Moon came out, and Sun said to her, “Which is Morning Star?” Moon looked at them for a moment, then pointed at one; but she made a mistake, for she pointed at Scar-Face. “Oh!” said Sun “you are a foolish woman! This is the star you mistook for Morning Star. After this his name shall be The-one-you-took-for-Morning Star.”

Now Scar-Face said with his new companion at Sun’s house. Sun told him that he could go anywhere in the sky-land except straight west or straight down: he could go in any other direction. One morning, when Morning Star and Scar-Face were out together, Scar-Face said, “Let us go that way,” pointing o the west. “No,” replied Morning Star. “It is dangerous. My father said we must not go there.” “Oh,” said Scar-Face, “let us go anyway.” Morning Star refused, but at the fourth request he said, “All right, let us go.” So the two boys went in the forbidden direction and presently they came to a place where there were seven large white geese. At once the birds attacked them. Morning Star ran, calling out “Now you see.” Scar-Face did not run, but killed the seven geese with his club, and ran home. Before he reached home, he overtook Morning Star, and said to him, “There is no danger now. I killed all of these birds.”

When they reached home, Morning Star told his mother what Scar-Face had done, but she said to Scar-Face, “I will not believe you until you get their heads.” So the boys returned and took the heads of the seven birds. (This is supposed to be the origin of scalping, and no one will believe that an enemy is killed until his scalp is produced.)

Some time after this, Scar-Face and Morning Star went out together as before, and Scar-Face said, “Let us go that way again.: “No,” said Morning Star. “It will be more dangerous than before.” Scar-Face insisted, and at the fourth request, Morning Star consented. As they were going along, they saw seven cranes. When the cranes saw the boys, they took after them. These cranes were terrible looking birds, and Scar-Face was badly frightened; but he took off his robe and held it in front of him. As the cranes came up, they began to peck at the robe, whereupon Scar-Face struck them one by one with his club.

Now when Scar-Face reached home, Sun was there and asked where had been Scar-Face said that he was walking along when some large cranes took after him, and that he had killed all with his club. “Oh!” said Sun, “I will not believe it until you have shown me their heads.” So Scar-Face returned to the scene of his conflict, and brought away the heads of the cranes. When Sun saw the heads, he believed him. Sun was greatly pleased at the courage of Scar-Face and brought out a bundle. “Here,” said he, “are some clothes for you, - a shirt and leggings. These I give to you because you have killed some very dangerous and troublesome birds.” Then Sun took up the leggings, and painted seven black stripes on them saying, “I make these here as a sign that you killed enemies.” Then Sun sand some songs which were to go with the clothes.

After a time, Scar-Face said to Sun, “Now I should like to return to my people. I have been here long enough.” “Alright,” said Sun. “You may go.” Then Sun took Scar-Face out, put a hoop or ring of cedar around his head, and, as soon as the hoop was on, Scar-Face found that he could see down to his people. “Now,” said Sun, “shut your eyes.” Scar-Face shut his eyes. When he opened
them, he found himself down by the camp of his people. Now in the camp at that time there were some Indians who were playing at the wheel-and-arrow game; and one of the players, looking up, saw a black object coming down from the sky. He called out “Oh look at that black thing!” The all stopped to look. They saw the object coming closer and closer. At last it reached the ground, some distance from them. It appeared to be a person. Then the old chum of Scar-Face who was among the young men playing at the sheel-game, recognized Scar-Face, and rushed up to him; but as he approached, Scar-Face said, “Go back! Go Back! Do not touch me. You must get some willows’ and make a sweat-house out here from the camp.”

Then the chum went back to the people of the camp and explained to them. A sweathouse was prepared. When all was ready, Scar-Face went into the sweat-house with the bundle containing the suit of clothes given him boy the Sun. When the bath had been taken, Scar-Face came out carrying the bundle in his arm. He said to his chum, “My friend Sun gave me a suit of clothes: now will give them to your.”

Now this is why our people say that the sweart-house came from the sun. The medicinelodge we make at the sun-dance is the lodge of the sun where Scar-Face had been. The weaseltail suit which Scar-Face brought to his chum was just like those you see to-day. There was a disk on the back and one on the front. There were seven black stripes on the sleeves. These were for one group of seven birds that Scar-Face had killed. Sometimes the feet of these birds are painted on the shirt. The seven bands on the leggings are for the seven other birds that Scar-Face killed. Scar-Face directed that only such persons as performed great deeds were to be allowed to wear such a suit. After a time Scar-Face went back and became a star.

A-ne’ma-ye ek’ko tsis
The Twin Brothers


Tells the story of Castor and Pollux, stars in the constellation of Gemini.

A long ago there was a man by the name of Smart-Crow. When he traveled, he always went by himself. One day after he was married, he told his wife that in the future two children would be born to them, both boys. He predicted that one would be an outlaw and the other would be a good man. Smart-Crow knew this because a Crow had given him the information in a dream. The Crow also told him, that, before his two children were born, an evil man would try to kill their mother. The Crow told the man that he must warn his wife. It said, “This man will come to the lodge when you are away, and ask to come inside. Your wife must say nothing to him. He will repeat the visit four nights.” The next time Smart-Crow went out to hunt, he told his wife about this dream, and warned her not to speak to the strange man.

While Smart-Crow was away, the strange man came to his lodge. After a while the woman thought to herself, “Why does not this man come in?” Now the stranger had great power. He read the woman’s thoughts, and, as soon as she thought this, the man answered by saying “I will tell you why.” So he entered the lodge and sat down, saying as he did so, “I knew you wished me to come in.” Now the woman began to cook some meat for the stranger, and when it was ready, she put it in some wooden bowls, and placed it before him. There were four kinds of bowls in the house. Some were made of hard knots of wood,; some, of bark; some, of buffalo-horn; and some, of mountain-sheep horn. After the woman had cooked the meat, she placed it before the stranger in a wooden bowl. The stranger looked at and said, “That is not the kind of bowl from which I take my food.” Then the woman took the food, and putting it into a bark bowl, offered it to him again. “No,” he said, “I do not take my food from bark.” So the woman took the food, placed it in a bowl of buffalo-horn, and offered it to him for the third time. Again he refused, saying that he did not take food from horns. The woman took back the food, and, putting it in a bowl of sheep horn placed it before him; but he refused to take food in such a dish. Now the woman was troubled, and looked about the lodge for something in which to serve the food. Finally she saw a piece from the horn of a moose, and offered him food upon it. This he refused also. As she looked about for something else, she happened to see a blanket. “That will not do, either,” said the stranger. Then she offered her dress. “That is nearer to the kind I must have,” he said. Then the woman said, “Oh, well, I will put the meat on my belly.” “All right” said the stranger. The woman then lay down on her back, and placed the meat on her belly. She was heavy with child. The stranger had a white stone knife, which he sharpened and began to cut the met. Three times he cut the meat; but the fourth time he said, “I came near cutting you.” The fifth time he cut the woman open. The twin boys came out.

Thus the boys were born. They were twins. The stranger took one of them, put him down near the ashes, and as he did so said, “You shall be called Ashes-Chief.” Then he took the other, stuck behind the lining of the lodge, and said, “You shall be called Stuck-Behind.” Then the man went away. He carried a small lodge, with the skin of the running-fisher, for a flag. After a while Smart-Crow returned from his hunt, bringing much buffalo-meat. As he came over the hill near his lodge, he saw no smoke rising from the smoke-hole. “Now,” he said to himself, “I know what has happened. I knew that woman would invite the stranger in.” When he entered the lodge, he saw Ashes-Chief lying by the fire. While he was looking at his wife’s body he heard the other infant crying behind the lodge-lining.

Now Smart-Crow was very angry, and rushed out in pursuit of the stranger. He followed his trail and soon overtook him. As he came up, he said to the stranger, “Now I shall kill you.” “My friend,” said the stranger, “I will restore her to you.” “I do not believe you,” said Smart Crow. “My friend, I tell you I will restore her,” repeated the stranger. “I cannot believe it,” said Smart-Crow. “My
friend, “said the stranger, “I will restore her to you.” “You are a liar,” said Smart-Crows. Then the stranger began to sing a song. The words of this song were as follows:-

“I am a great medicine (powerful)
Everything in the ground hears me.
Everything in the sky hears me.”

When smart Crow heard this song, he believed of the stranger. Then the stranger took the bundle from his back, and said, “I give you this lodge and the running-fisher skin.” The stranger set up the lodge. There were four buffalo-tails hanging to its sides. Two of these were cow-tails, and two were bull-tails. One of each hung in front, and also behind. This lodge was called the Four-Tail Lodge. The stranger told Smart-Crow that the hanging of the buffalo-tails on the lodge would make the buffalo range near it, so that the people would always have meat. The stranger transferred this lodge to Smart-Crow. He sat down upon a stump, explained the ritual to him, and also taught him the songs. Among other things he said, “The punk which you use to make firers is made of bark, and does not kindle quickly: take puff-balls (fungus) instead for they are much better. They are the Dusty Stars. You are to paint these stars around the bottom of the lodge. At the top of the lodge you are to paint the Seven Stars on one side and the Bunch Stars on the other. At the back of the lodge, near the top, you must make a cross to represent the Morning Star. Then around the bottom, above the Dusty Stars, you shall mark the mountains. Above the door, make four red stripes passing around the lodge. These are to represent the trails of the buffalo.”

When Smart-Crow had received all of the instructions belonging to the new lodge, and had learned all the songs, he went away with it and returned to his own lodge. He picked up Ashes-Chief, and said to a large rock lying near by, “I give you this child to raise.” Then he pulled down the lining of the lodge, picked up Stuck-Behind, and called out to his friend the beaver, “I give you this child to raise.” So the rock and the beaver took the boys away.

The boys grew up. When they were about fifteen years old, Smart-Crow began to wish that he might have them back with him again. He went out to get them back; but the boys were wild, and knew nothing about people. So, when the boys saw him coming, Ashes-Chief ran into the rock and Stuck-Behind into the beaver's house. Then Smart-Crow took some arrows from his quiver, laid them down near the rock, and concealed himself in the bushes. After a while, Ashes-Chief came out, saw the arrows, and looked curiously at them. As the boy was about to pick them up, Smart-Crow sprang out and caught him. Now Ashes-Chief had been raised by the rock, and was so strong for his age that Smart-Crow was scarcely able to hold him. He saw that his son would soon break away; so he said, “Ashes-Chief, lick my hand, and you will know that I am your father.” Then Ashes-Chief licked his hand, stopped struggling, and said, “Yes, you are my father, and I will go with you.”

Now Smart-Crow was anxious to secure Stuck-Behind and advised with Ashes-Chief as to how to proceed. Finally they decided to draw him out of the beaver's house by playing the hoop-game. Smart-Crow concealed himself near the house while Ashes-Chief began to roll the hoop back and forth near the door. Stuck-Behind became curious to know about the hoop, and ventured out to play. When he was outside, Smart-Crow sprang upon him, and held him fast. Now, Stuck-Behind had been raised by the beaver, and for that reason was very hard to hold. Smart-Crow said to him, “Lick my hand, and you will know that I am your father.” He did so, and recognized his father.

When the boys were at home with their father, their names were changed. Ashes-Chief was not called Rock, and Stuck-Behind was called Beaver. Rock was the evil one, and Beaver the good one, as the Crow had told their father in the dream. One day Rock said to his father, “Make me a bow and two arrows.” “What do you want with bows and arrows?” said Smart-Crow. “Well,” said Rock, “Beaver and I wish to go out to hunt for buffalo. While we are gone, you must go back to our old lodge where the bones of our mother line, and cut a stick as she used for stirring the meat when cooking. Wait there for us until we bring the meat.” Then Rock and Beaver went on their way to hunt.
Now, at this time, the people cooked in pots of clay. These were shaped out of mud by the hands, and put in the sun to dry; then the kettle was rubbed all over with fat inside and out, and placed in the fire. When it was red hot, it was taken out, and allowed to cool. Such a pot was good for boiling. Rock told his father to take one of his mother’s pots, fill it with water, and put it over the fire so that it might be ready for his mother to boil meat.

After a while the boys came up to their mother’s lodge, where her skeleton lay. They had a great deal of meat with them. Rock said, “Now I shall take a little meat from each part of the buffalo, boil it in the pot and then make medicine to put over the skeleton of our mother.” Beaver said “I shall help mother with the heart, the brains, and the marrow.” Rock took up the tongue, blew his breath on it four times, and put it into the pot. Rock said to Beaver, “I will help mother in two things and you may help her in the other two things.” Now Smart-Crow was lying down in bed. The boys took his robe, and covered their mother’s bones. Then the pot began to boil more than ever, and Rock said to his father, “Get up, call mother, and tell her that her pot is about to boil over.”

The father arose from his bed, went over to the place where the robe lay, and said, “Get up, Woman! Your pot is about to boil over.” The bones did not move. Then Beaver called, “Mother, get up quick! Your pot is boiling over.” At this there was a little movement under the robe. Then Rock called out, “Mother, get up quick and feed us!” At this there was much movement under the robe, and parts of the woman’s feet could be seen beneath the edge. Now Beaver called to her, which made the fourth time, saying, “Mother, get up quick! I have a heart, brains, and marrow for you to eat.”

The woman sat up and drew a deep breath. “I have had a long sleep.” she said. “I am very hungry; I shall eat.” The boys gave her some of each part of the buffalo to restore her to life. For eyes, they gave her the inside of the eyes; for brains, they gave her the brains; for tongue, part of the tongue; for heart, part of the heart, and so on. When she had eaten all of these, she got up and set food before her children and Smart-Crow as she had always done.

Then Smart-Crow said to his wife, “Let us move from this place, it is an unlucky place for us. Let us leave this lodge here and take the new one given me by the stranger. When this new lodge is up in a new place, make a sweat-house, that I may go through it, for we have a medicine lodge now. I did not kill the stranger, because he promised to restore you to me, and gave me this new lodge. After all I have seen, I believe that this lodge is very powerful. You have been asleep for a long time. Your bones were bleached, now you are alive: and it is the power of this lodge that made you so. When we are old, we will give this lodge to Beaver; he is a good man. Rock, on the other hand, is no good, and he will not live long.”

This happened out in the far north, when the Piegan lived there.

When the mother had put up the new lodge in a new place, she made a sweat-house. Smart-Crow put the skin of the running-fisher around his shoulders, painted his face, took off his breech-cloth and moccasins, and was ready to go through the sweat-house. Then he covered the sweat-house with the skin of the new lodge, that it also might be purified. When he came out of the sweat-house, he painted his wife and children, and, taking up the lodge, put it away. When all his was arranged, the woman looked at the lodge, admiring it. “What are those round things at the bottom? she said.

“These,” said Smart-Crow, “are for two purposes. The will help us to live long and to make fire quickly.” When they had gone inside the lodge, Smart-Crow said to his wife, “Now I shall teach you how to use the smudge.” Then he took some moss from the pine-tree and laid it upon the fire, singing a song. “You are to do this,” he said, “every morning and every night. Also you must sing two seven-songs (fourteen) that I shall teach you.”

Now all this time Smart-Crow had been way from his people; but now he returned with his family and the new lodge. This created a great sensation.

Now the hoop that was used in catching Beaver was the big game-hoop. Rock and Beaver often played at this game. One day their father told them that they must not roll the hoop in the same
direction as the wind. Then they went out to play. Now rock said to Beaver, “There is no reason why we should not roll this hoop with the wind. Nothing will happen if we do.” “Oh,” said Beaver, “our father requested us not to do this, and we should obey him.” However, Rock paid no attention to what he said, and started the hoop in the direction of the wind. Now, the hoop continued to roll and roll. It would not stop, and as the boys followed along, waiting for it to fall, they were brought near a rock lodge. As the hoop rolled by, an old woman came out, took it in her hands and invited the boys inside. They both went in.

Now this old woman had some kind of power. She killed people by suffocating them with smoke. As soon as the boys were seated, she took out a large pipe with a man’s head for a bowl. Then she placed a great heap of wood on the fire, and, after shutting the door and the ears (smoke hole) of the lodge, lighted the pipe and made a great smoke. Then the old woman said to the boys, “Smoke with me.” “No,” said Rock “You must, “ said the old woman, “because it is the custom for the guest to smoke with the head of the lodge.”

Now this old woman was a cannibal, and the boys knew it. So Rock said to the old woman, “Well, I will smoke with you.” But Beaver refused. Then the old woman gave back the hoop, which Beaver took and put over his head. Rock to out a yellow plume and tied it to his hair. Now both of these things had power. The hoop kept the smoke away from the Beaver’s head, so that his head was in a hollow place surrounded by thick smoke. The plume in Rock’s hair whirled in the air, and kept the smoke away from his face. Now the smoke was so thick at last that the old woman could not see. She did not know that the boys had such great power. It became so thick that she was almost suffocated herself. “Oh!” she said, “there is too much smoke.” She tried to rise to open the door, but fell down dead. Then the boys went outside of the lodge, and called out as if talking to the old woman. In this way they made all manner of fun of her great power. Looking around, they found themselves near the rock that had raised Rock. Then Rock took an arrow from his quiver, spit upon the point, dipped it into the water, and, pointing toward the rock, asked it for help, saying, “Make the arrow do what I wish.” He threw the arrow at the lodge in which the old woman lived. It struck at the bottom, making a hole from which the water began to flow. The stream continued to increase in size until it carried the lodge and rock away. Then the boys went home. Rock told his father every thing that had happened, and laughed a great deal.

There was a tall tree upon which grew some fine berries. The father said to them, “You must not eat those berries.” Some time after, when the boys were out by themselves, Rock looked up at the tree, and said to Beaver, “Come, let us get some of those berries.” But Beaver said, “No. Every time father requests us to do a thing, you do the opposite.” But as Rock insisted upon getting the berries, Beaver consented. Now, beneath this tree lived a monstrous snake with a large horn in the middle of his head. When they came near the tree, Beaver was afraid and said to Rock, “I do not wish to climb the tree. You get the berries.” Then Rock began to climb the tree, and when he was up in the branches, the snake came out of the bushes and tried to hook Rock; but missing, his horn struck the tree and stuck fast. Then rock broke the tree and twisted the trunk, which pulled out the snake’s brains. This snake always killed people who come to gather berries. Then the boys took some of the berries and went home. Rock related the adventure to his father, and laughed as if it were but an incident.

Once they were forbidden to shoot at the morning-bird. Now the morning-bird was a very powerful creature; everyone was afraid to do anything to him. One day when the boys were out, they saw this bird, but could not get at him as he was high in the air. Later they saw the bird near the ground, and Rock suggested to Beaver that they send an arrow after it. Again, Beaver tried to persuade Rock to heed the commands of their father; but without success. So Rock shot an arrow into the bird. It fell into the branches of a tree, almost within their reach. Rock stood upon a log and tried to reach the bird; but every time he tried, the bird got a little higher. Then he got upon a limb, and finally into the tree itself. Then, as he climbed the tree, the bird went higher and higher, and the tree became taller and taller, until Beaver, who stood upon the ground, could not see them. Now
Beaver felt very much ashamed that he had yielded to his brother’s folly. He did not feel like going home to tell his father, so he sat down by the tree and began to cry. When this happened, the boys were men, but Beaver cried so much at the foot of the tree that he became a dirty little ragged boy again.

At this time, the Piegan were out looking for buffalo, but could find none. They were forced to live upon such berries as they could find. One day an old woman was our gathering berries when she heard a child crying. Looking around, she found Beaver at the foot of the tree. He was almost starved. The old woman felt sorry for him, picked him up and took him home. She gave him to her daughter to care for, saying, “here is my grandson. When he grows up, he will run errands for us. You must feed him.” Now, as they had no meat from which to make soup for the child, the daughter gathered some old bones around the camp and boiled them in a kettle. A few days after this the chief of the camp, who had two beautiful daughters for whom there were many suitors, made a public announcement. He said, “To-morrow morning a (prairie) chicken will sit upon a tall tree near the camp, and all the young men are to shoot at it with bows and arrows. The man who hits it first shall receive my eldest daughter for a wife.”

Now Beaver was a very dirty little fellow, he even defecated in bed and every one in the camp talked about his uncleanness. When he heard what the chief said, he said to the old woman who found him, “Make me some arrows and I will try to hit the bird.” “Oh, you dirty thing!” said the woman in disgust. “You are a disgrace to the camp; you would nauseate everybody. The girl would not have you anyway.” The boy insisted that the arrows should be made for him; and the fourth time he made the request, she made a bow and four arrows. All were very poorly constructed.

When the time came for the young men to try their skill at shooting, the little boy came among the crowd, wearing an old pieces of skin for a robe. He was pot-bellied. His eyes were sore and dirty. The people made fun of him. “What can you do?” they said. “What brought you anyway?” So they threw dirt at him and mocked him. Then the shooting began. One after the other, the young men discharged their arrows at the bird; but no one made a hit. Beaver looked at the bird in the tree, then discharged one of his arrows, which came near hitting the bird.

Now there was a man in the crowd called Crow-Arrow, who had never been able to get a wife. He observed that the boy had some power and envied his success. Then he got his bow ready to discharge and arrow at the same time as the boy, and, in case the bird was hit, he would dispute the ownership of the arrow. When the boy discharged his second arrows, Crow-Arrow discharged his also. The boy’s arrow struck the bird, and it fell to the ground. Crow-Arrow, who was very swift, ran at once to the spot, pulled out the boy’s arrow and put in his own. The people, who were all looking on, said, “No, it was the boy who hit the bird.” Then they all went before the chief, and announced to him that the little dirty boy had won; but Crow-Arrow insisted that it was his arrow that killed the bird. The chief looked at the small dirty boy with disgust, and said to himself, “I cannot have him for my son-in-law, even if he did hit the bird.” Then he said to the people, “Since there is a dispute about this, we will try something else. All the young men shall set wolf-traps, and whoever gets a black one or a white one shall be my son-in-law.”

Beaver went home and asked his grandmother to make him a wolf-trap. The grandmother said, “Oh, you get away from here, you dirty boy! No wolf would ever go into a trap you touched.” But as Beaver insisted, she fixed up a trap just back of the lodge. In the evening, Beaver went out to fix his trap, and when morning came there was both a black and a white wolf in his trap. Now Crow-Arrow had set a trap also, and in the morning found a black wolf in his trap. Crow-Arrow hurried to the chief with his prize; but when he got there he found Beaver with two wolves, one black and one white. “Well,” said the chief, “there is no dispute about it this time. The little dirty boy must be my son-in-law.”

So the eldest daughter was dressed up, her face painted, and taken over to the lodge where beaver lived.
Now Beaver always defecated and urinated in his bed. When the girl saw him she was disgusted, for his eyes were dirty and his abdomen was very large, but she gave him some food. He ate, and immediately defecated in the bed. His grand mother cleaned him, ad scolded. After awhile the girl and Beaver went to bed, but he dirtied the bed as usual. When the girl awoke, the condition of the bed caused her to vomit. The girl said she would not live with such a husband as this, and went over to live with Crow-Arrow. When the chief heard this, he was very angry, because he knew that the little dirty boy possessed some kind of power, for which reason his daughter should have kept her promise. So to make amends, he sent his youngest daughter over to be the wife of Beaver. Now this girl was rather bashful, and when she came to the lodge where Beaver lived, she got behind the old woman, and, peeping out at him, whispered to the old woman, “I think that boy is very pretty. I shall stay with him because he is so nice, and I see no reason why my sister left him.” Then she went to bed with Beaver. He did as before, but the girl got up and asked the grandmother for a piece of robe to clean the bed. She was cheerful and kind.

Now all this time people had been without meat, and the chief sent out the young men in every direction to look for buffalo, but none were seen. Beaver said to his wife, “You are to go home to-night and stay with your mother until I send for you.” He said to his grandmother, “You also must go away from this lodge and not return until I call you. You must leave me alone here.” As soon as they were gone, Beaver took some yellow paint, put it into the hollow of his hand, mixed with water, and painted his entire body. Then he took hold of his hair, pulled it down and painted it. At once he became a man, as before. Before him stood the Four-Tail Lodge of his father. In it was a dress covered with elk-teeth for his wife, also a fine white robe for himself. There were beds and other furniture in the lodge. Then Beaver sent out for the old woman, his grandmother, and when she came up directed her to wait outside of the door. Then he brought out a fine dress covered with elk-teeth, and told her to put it on. As soon as she did this, she became a young woman again. Then he sent the grandmother over to the lodge of the chief to call his wife. The young woman did not recognize the grandmother, but followed as requested; and when she came to the strange lodge she also failed to recognize Beaver. Beaver explained to her what had happened, and told her that she was to be rewarded for her kindness to him when he was such a dirty little boy. He brought out to her a fine dress covered with elk-teeth, and rubbing paint upon her hair, pulled it gently until it became very long. Then he sent his wife to her father. When she came in she said, “Father, my husband is about to go out to drive the buffalo over to the enclosure. There will be one white buffalo in the herd, and my husband requests that no one shoot it, but that it be roped, and then knocked on the head so that no injury be done to the skin, for it is to be made into a robe.”

All the young men of the camp went out with Beaver to drive the buffalo. Crow-Arrow also went. Beaver took a white rock and placed it near the edge of the enclosure, then he took a rock colored like the beaver, and placed it on the other side. Then he directed the young men to lay rows of rocks spreading outward from these two. Then they laid down between them some buffalo-chips. As they were putting down the last Beaver shouted four times. Everybody looked around. They saw a herd of buffalos, a white one and a beaver-colored one in the lead. Then the men hid behind the rocks. This was a buffalo-drive.

When the people were going out with Beaver to prepare the buffalo-drive, Crow-Arrow came upon an old buffalo-carcass. He cut out some of the spoiled meat, and carried it back to the chief to make him believe that he had the power to get meat first. While Crow-Arrow was on his way back, heard the shouting and the noise of the buffalo going over. He ran up as quickly as he could, and saw the white buffalo already roped and about to be knocked upon the head. Looking around, he saw the beaver colored one and shot it. When the buffalo were killed, beaver called to his wife, directed her to take his arrows, rub them over the skin of the white buffalo and throw them away.

These arrows were feathered with eagle-tails. As the woman threw them from her, all the young men for them, because they were regarded as very good medicine. When Crow-Arrow saw this, he directed his wife to take his arrows and do likewise with the skin of the beaver-colored
buffalo. Crow-arrows were made of crow-feathers. Now when Beaver’s wife rubbed the arrows over the skin of the white buffalo, it was made smooth and clan; but when the wife of Crow-Arrow rubbed the skin of the beaver-colored buffalo, it did not change. So when she threw her arrows away, no one seemed anxious to pick them up. Now the wife of Crow-Arrow, the same one who deserted Beaver, felt ashamed. She came close to Beaver and said, “I wish you would give me some of your arrows to clean the skin.” “No,” said Beaver. “Once I married you, but you refused to live with me to clean me: now I shall not help you clean skins.” When Crow-Arrow saw what had happened he was very angry, and went home with his wife. He was very angry because Beaver seemed to have greater power than he. Now Crow-Arrow was a great medicine-man, and so he transformed himself and his family into crows, and they flew out at the top of their lodge. Then the crows flew around all of the lodges, and called out to the people in crow-language, “We shall starve you; we shall take all the buffalo away from you and starve you to death.”

After this no buffalo were seen in the country, because the crows took the buffalo over the mountains. Beaver and his people were soon driven to starvation; but the crows returned, flew over their lodges and mocked them. So Beaver called the people together in council and said to the young men, “What can you do? Has any one power to bring back the buffalo?” No one seemed to have such power. This was in the winter. Then Beaver said, “Let two young men go to the place where the beaver lives, cut a hole in the ice, build a fire and try to smoke the beaver out. Then I shall transform myself into a beaver and lie by the hole as if dead.” The young men did as directed. During the night, Beaver went down to the place, transformed himself into a beaver and lay down upon the ice as if dead. Part of the skin was pulled away, and his entrails could be seen. While he was lying there, Crow-Arrow flew up, looked down, and said, “Oh, yes! I know your game. I know you. It is no use for to try to get me in this way. Your people will starve. You think you are very smart, but you cannot get me. It is no use to try me in that way, because I know too much.” None of this made any impression upon Beaver, who looked precisely like a corpse. Then Crow said to himself, “Well after all, I believe it is a real dead beaver.” He came down and looked closely at the corpse, and pecked at the breast and eyes. They were all frozen hard; he could not make a dent in them. So the crow took up a piece of fat from the entrails. He flew to a place and began to eat. Then he said, “Yes, it is a real beaver.” Then Crow went back to the corpse and began to eat. Beaver lay still for a while, but suddenly transformed himself into a man, sprang on the Crow and caught him. As he struggled, the Crow cried, “Let me go! let me go! I will get buffalo for you.” “No,” said Beaver, “you are a liar. I shall hold on to you this time. I shall surely punish you.” So he broke the wing of the Crow, took him home and tied him to the smoke-hole of the lodge. Then Beaver gathered a lot of birch-wood and threw it into the fire, making a very black smoke. Now up to this time, all crows were white; and while Crow was crying in the top of the lodge, “Oh, let me go! let me go! I will bring you buffalo surely,” the smoke made him black, and crows have been black ever since. After Crow was as black as he could be, Beaver consented to let him go if he would call the buffalo. Crow promised, but, as soon as he was released, he flew to the top of the lodge and called back, “I shall let you starve, I shall let you starve. I was just fooling.”

Then the people of the camp scolded Beaver. They said, “You knew that he was a liar. You knew that he would not keep his word. You should have kept him fast until he produced the buffalo.” “Well,” said Beaver, “I will get the buffalo myself.” One of the men said, “I should like to go with you.” “What kind of power, have you?” said Beaver. “Well, I have some power,” said the man. I can transform myself into a swallow, a pup, and a spider.” “Well, you have some power,” said Beaver “but I have greater power. I can transform myself into anything, but you may come with me.”

Now, the name of this man was Little-Dog. He transformed himself into a swallow, and Beaver became a prairie-chicken. Then they started out to look for buffalo. As they went along, Little-Dog saw Crow’s camp in the distance. Then he transformed himself into a spider, and, coming up to a man belonging to Crow’s camp, inquired of him the whereabouts of Crow. The man informed him that he had gone over the mountain to live, and that there was a very high cliff behind them. Then...
Little-Dog transformed himself into a wallow, and Beaver into a horse-fly. Together they flew over the cliff. Here they saw Crow’s camp. While they were looking, Crow’s people moved their camp. Then Little-Dog transformed himself into a spider, and Beaver became a pine-tree. Now the two watched a long time for the buffalo; but they saw no trace of them around Crow’s camp. One day they saw Crow go away. Then they went to the place where the camp was first seen, and Beaver transformed himself into a digging-stick, and Little-Dog became a pup.

After awhile the young daughter of Crow came out to look around the old camping-place. She found the digging-stick and the pup, and carried them home with her. When she came up to her lodge, her mother was tanning a hide. The girl said to her, “Mother, these things were left behind when we moved camp.” So the woman thought no more of it, and the girl took the two into the lodge to play. Now the girl was very fond of the pup, and carried it about in her harms, with the digging-stick stuck on her back in the way that women carry babies. While the girl was playing with the pup, as children do, she raised up the edge of the bed. There was a deep hole under it and, holding the pup over it, she said, “Pul, o you see that deep hole? Do you see all the buffalo down there? Now Little-Dog and Beaver looked down into the hole and saw where the buffalo were hidden. As the girl was looking over, the digging-stick slipped from her back into the hole, and pup grew into a large dog, so large that he slipped down of his own weight. The girl was very much frightened, but went away without saying anything to her mother.

So Beaver and Little-Dog fell down into the hole. Beaver transformed himself into a man, and Little-Dog became a monstrous dog. At once he began to bark and chase the buffalo, and the man ran after them shouting. This frightened the buffalo so much that they dashed u through the hole and came out upon the earth. There were so many buffalo that it took them a long time to get out; so that Crow returned while Beaver and Little-Dog were still driving buffalo. Crow knew who was driving them out, and took his station by the side of the hole, waiting to kill them. However, they were not so caught so easily. Beaver caught hold of a buffalo, transformed himself into a stick, and concealed himself in the long hair of the neck. Little-Dog became a pup once more, and fastened his teeth in the long hair of the breast of a buffalo. Thus they were carried out, unobserved by Crow.

Now the buffalo were running over the Earth, they were restored to the people once more. After this, Beaver returned to his people. One day he told his wife that she must never put sagebrush on the fire as it was against his medicine; but one day his wife forgot this, and threw the sagebrush into the fire while Beaver was away. When beaver came in, he knew what had been done. He said to his wife, “Now, since you have used the sagebrush for the fire, I must leave you and go to my brother. You will never see me here again.” Then he took his white robe and a plume. He blew the plume up into the air and rose to the sky. His brother had been carried to the sky on the branches of a tree, and Beaver went up to him. Now they are both stars. Every night we see two large stars side by side: these are the two brothers Ashes-Chief and Stuck-Behind.

A-ne’ma-ye ek’ko tsis
The Moon Woman

Francis Frasier, pp. 36-37.
Tells about the shapes seen on the surface of the Moon.

Long ago, the Moon Woman was an Indian girl, the beautiful daughter of a great chief. She loved a young warrior of the tribe, and he loved her; but he was an orphan and poor, and had no goods wherewith to pay bride price the old chief demanded from the man who would wed his daughter. Hoping to acquire the wealth he needed he left with a war-party, to be gone for many moons. While he was absent, a wealthy war chief, a much older man, came to the maiden’s father with an offer of many horses, many robes, and other valuables.

Her father accepted them, and, was taken to the old war chief’s tepee, and made his wife. The war chief was kind to her, and nothing was spared to make her happy, but she only wept, and grew more frail day by day. At last, a son was born to them and the old chief thought that surely, now, she would be content; but still she grieved, and in a short time, she died. Her husband was heartbroken—for he had loved her. He put her body in his own tepee, with the most valued of his possessions, and he bound the lodge with rawhide rope so that her spirit could not leave.

For three days and three nights he stayed there, pleading with her spirit to return to her body, and mourning for her. At the end of that time his friends came and took him away with them, and the tepee was left, standing alone on the prairie. But the young warrior remained behind when the rest moved away. And after a while, he went to the tepee and spoke to the dead girl. He told her all his love, and his loneliness for her; and her spirit answered him. When he touched her hand it moved and warmed, and then she was alive again.

The young warrior was happy, though he knew well that in reality his sweetheart was a ghostwoman, and might leave him at any time. They lived together for a long while, but at last the woman remembered that she had a son, and she took a great longing to see the child. The warrior tried to dissuade her, but she would not listen. She coaxed him to take her to the camps of their people. He protested that no good would come of it, but she insisted, and they went. He made only one condition—that she disguise herself as a man, so that her husband would not recognize her.

That she did, but when they were in the camp, in her husband’s lodge, she betrayed herself by some feminine gesture. With a shout her husband attempted to seize her. Hemmed in, she could not escape through the doorway of the lodge, so, snatching up her son, she jumped toward the opening at the top of the tepee. The old war chief slashed at her with his stone axe, but she was beyond his reach, though he cutoff off part of one leg. She dropped the child, but she herself escaped.

The Sky People were sorry for her, and sent a flight of eagles to bring her up in to the Sky Country, where she was given a home in the Moon.

All you have to do is look at the face of the full moon. She is an old, old woman, now, but she is there to this day. And there is no doubt about who it is, either - for the woman in the moon has only one leg.

A-ne’m-a-y ek’ko tsis
The Moon Woman

Clark Wissler, D.C. Duvall, pp. 72-73.
Second version of the story telling about the shapes seen on the surface of the Moon.

Once there was a woman with two children. She had a black birthmark on the calf of her leg. One day the woman disappeared, and she could not be found anywhere. After a time, her husband married again. Now the woman have been enticed away by a man who lived in the moon. This man had met her as she was going for wood. After they had lived in the moon a while, the woman said to her husband, “I am anxious to see my children again. Suppose we go down and visit them.” So the woman disguised herself in men’s clothing and they both went to her former husband’s lodge. They told him that they were Cree Indians, but that they could speak Piegan. The father and the two children took the strange men into the lodge and treated them kindly. The smaller of the two strangers seemed much interested in the children, kissed them, played with them, etc. The father of the children took notice of this and grew suspicious. At night, when it came time to go to bed, he also noticed that one was very slow and cautious in taking off his leggings. The next day, when both of the strangers were out of the lodge, one of the children said, “Father, that young man has teeth and eyes like those of my mother. Somehow he makes me think of mother.” The father said to himself, “I believe that stranger is my former wife in disguise. I shall watch my chance and find out if this is true.”

The father now set about discovering the identity of the strangers. He began to make arrows for himself, and gave some material to each of the strangers. As he did so, the taller stranger said, “My friend is not good at making arrows.” But the father insisted that they all make arrows, which they did. He noticed that the arrows made by the smaller stranger were very poor indeed. This stranger also kept an otter-skin drawn closely over his forehead, and in eating kept his mouth closed as much as possible. The next night the father kept the strangers up very late, telling them stories so that they might get very sleepy, and sleep so soundly that he could look at their legs without waking them, and so discover whether or not one of them had the black birth-mark of his former wife. When they were all sound asleep, he took a stick, put some grass and bark around the end, stuck it into the fire, and, using it as a torch, cautiously raised the robe covering the smaller stranger, and discovered the familiar mark on the leg. He also saw that her breasts were bound down to make her look like a man. Then he put out the light, for he knew that the stranger was really his former wife.

When morning came, he invited the strangers to get up and eat; but before doing so he directed his children and their stepmother to go outside of the lodge. When the strangers arose, he stood at the door with a white rock knife in his hand, and informed them of his discovery. He addressed his former wife, upbraiding her for her conduct, and her impertinence in returning to his lodge in disguise. “Now,” he said, “I shall kill you both for you cannot get out except through the top of the lodge.” Then the woman began to plead for her life, but to no purpose. Just as the angry husband was about to execute his threat, the strange man, with the woman following, rushed out through the smoke-hole like shooting stars. As they passed out, the man through his rock knife at the woman, striking one of her legs and cutting it off.

The woman and her new husband went up in the sky to live in the moon as before, and this is why the woman we now see in the moon has but one leg.

A-ne’ma-ye ek’ko tsis
About the Authors


Clark Wissler (1870-1947) was an anthropologist with the American Museum of Natural History. He conducted field work in the northern plains from 1902 through 1905. He collected artifacts and ethnographic information from Sioux reservations but his major work was his series of monographs on the mythology of the Blackfoot. Wissler worked extensively with translator D.C. Duvall (1877-1911), part Blackfoot and part French Canadian. The Mythology of the Blackfoot Indians was published as a collaborative work in 1908.


Francis Fraser was born in Alberta, Canada in 1920. Her family lived on a farm. Francis considered herself a farm girl all of her life. As a young girl, Francis began writing short narratives for her father who was assembling a scrapbook on the Blackfeet. After an accident, in which she was laid up for several months with a leg cast, Francis started recording Blackfeet stories. Friends encouraged her to write their stories so that they wouldn’t be lost to time. She became a part-time writer and published magazine articles about Blackfeet life. By the time of her death in 1989, Francis Fraser had received many tributes for her efforts to preserve an important cultural aspect of the Blackfeet.
Additional Resources

Indian Peoples of the Northern Great Plains - Online Image Database, http://www.lib.montana.edu/digital/nadb/


Photographic Essay on the Blackfoot Tipi http://www.glenbow.org/exhibitions/online/blackfoot/

Niitsitapiisini (Our Way of Life) Glenbow Museum http://www.glenbow.org/blackfoot/

National Aeronautics and Space Administration www.nasa.gov

Images from the Hubble Space Telescope www.hubblesite.org


National Space Science Data Center http://nssdc.gsfc.nasa.gov