

Title

Lakota Ethnoastronomy

Grade Level

High school astronomy, physics or other science class (junior or senior level).

Theme

Major Lakota spiritual ceremonies were mirrored above in the stars – the *wonija* (breath) of the *Wakan Tanka* (Great Spirit) and below in the geographical features of the sacred Black Hills.

*You see the sky now
but the earth
is lost in it
and there are no horizons.
It is all
a single breath.
- Leslie Marmon Silko*

Duration

Three hours in one to three sessions.

Goal

To examine the relationship between Lakota knowledge and understanding of the heavens, and their ability to mirror on earth the activity of the spirits in the star world through their ceremonies, concept of time and sacred places in the Black Hills.

Objectives

- Students will learn the portions of the Lakota creation myth related to the sun, moon and stars.
- Students will learn the story of Fallen Star and his importance in Lakota oral tradition as the bringer of higher consciousness (light) to the Lakota people.
- Students will become familiar with the major Lakota constellations and their layout in the sky in relation with the milky way and major named stars, and know which constellations are in the elliptic plane (on the path of the sun).
- Students will become familiar with how Lakota ‘Keepers of the moon and of the stars’ knew which constellation the sun was in.
- Students will become familiar with the geographical layout of sacred places in the Black Hills, the mirroring of those sites with Lakota constellations, and the use of the position of the sun within those constellations as a calendar of the spring journey of rejuvenation.
- Students will use the historic movement of stars to calculate when the spring journeys were started in Western time through a knowledge of astronomy and the movement of stars.

South Dakota Standards

- 9-12.E.2.1. (Comprehension) Students are able to recognize how Newtonian mechanics can be applied to the study of the motions of the solar system.

- 9-12.P.2.1. (Analysis) Students are able to apply concepts of distance and time to the quantitative relationships of motion using appropriate mathematical formulas, equations, and units.
- 9-12.N.1.2. (Synthesis) Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws.
- 9-12.A.2.1. (Comprehension) Students will use algebraic properties to transform multi-step, single variable, and first-degree equations.
- 9-12.A.2.2. (Application) Students will use algebraic properties to transform multi-step, single variable, and first-degree inequalities and represent solutions using a number line.
- 9-12.G.1.1. (Application) Students are able to use resources, data services, and geographic tools that generate and interpret information.
- 9-12.G.1.2. (Application) Students are able to interpret geographic representations when given information about places and events.
- 9-12.N.1.1 (Evaluation) Students are able to evaluate a scientific discovery to determine and describe how societal, cultural, and personal beliefs influence scientific investigations and interpretations.

Cultural Concept

Lakota culture includes a complex understanding of the heavens and a mirroring of the heavens on the Earth, reflected in the sacred locations chosen for their major ceremonies.

Cultural Background

The creation story of the Lakota people demonstrates an awareness and knowledge of the heavens from the earliest time long ago. *Wi-akan*, the Sun God, was the last of the four superior gods created but became the chief of the superior gods, being above the dome of *Skan*, Sky. When *Skan* granted to each of the Superior Gods the power to create a companion, *Wi-akan* created a disk like himself, only more lovely, and named her *Wi-win*, the moon. *Wi-akan* ruled the day and *Wi-win*, an associate god, ruled the night. *Skan*'s creation was *Tate*, the wind, who roamed the world day and night as his messenger, so that *Skan* was still lonely. He consulted with *Ksa*, Wisdom, who told him that he should create a spirit folk that he could communicate with and who would keep him company. So *Skan* took from the waters part of their *Nagila* (spirit or steam) and out of it made tiny beings, the Star people, that he named *Wican* (sunlet) and placed them high above the blue dome that was himself. [1]

Lakota oral tradition speaks of the story of Fallen Star, who was the bringer of light and higher consciousness to the Lakota people. Fallen Star was the son of *Wazia Wichaghpi*, the North Star, and *Tapun Shawin*, a beautiful Lakota maiden. At that time the North Star could wander the sky and earth, and wooed and won the beautiful *Tapun Shawin*. He took her to live with the Star People in the heaven. She was told that the star world was hers, but was warned not to dig any wild turnips or other tubers. She became pregnant. And while wandering in the woods one day, she decides to dig up and eat a turnip. In pulling it out, a hole opens in the star world. She looks down, sees the earth and her own village and becomes homesick. She decides to return to earth by making a rope of turnips. She lets herself down but the rope is too short and she falls. The crash kills her, but her baby is born. The baby is raised by a meadowlark. Since meadowlarks speak Lakota, the baby does too, and is named *wichapi hinjpaya* (Fallen Star). Fallen Star matures rapidly, in

days rather than years. He is taller than normal and a light emanates from him. He travels from one Lakota band to another, where he is recognized, expected and revered. [2] Fallen Star is a central figure in the visions and stories of many contemporary *Oceti Sakowin*; The Left Heron family calls him a Messiah, while Black Elk named him “Saviour” and “Holy One”. [3]

A translation of the oral tradition of the Lakota people speaks to the origin of the Black Hills as due to a great race between the 4-leggeds (with their allies the moving and growing things) and the 2-leggeds (with their allies the winged things). As all the animals raced around and around the great racetrack, animals fell and were trampled, turning the earth red with their blood. The running shook the earth so that the land in the middle rose up, forming the Black Hills. [4]

Several other geographical features of the Black Hills played important roles in the spiritual and sociological life of the Lakota people:

1. Harney Peak, known to the Lakota as *Hinhan Kagha Paha*, or Evil Spirit Hill, part of a set of very, very old granite outcroppings.
2. *Pe Sla*, a bare hill marking the very center of the Black Hills.
3. Wind Cave.
4. *Pte Tali Yapa*, Buffalo Gap, in the southeast corner.
5. *Mini Kata*, Hot Springs.
6. *Mato Paha*, Bear Butte, which stands solitary on the east side of the Black Hills.
7. *Mato Tipilia*, or Bear’s Lodge in the northwest corner of the Black Hills.

Of these eight features, the seven above plus the race track, five of them [6] were used in the spring journey that followed the pattern of the stars. These are shown in Table 1.

Important Lakota constellations are shown in Figure 1 (Figure and diagrams).

A map of the sacred places in the Black Hills is reproduced in Figure 2.

Student Activities

- Read portions of creation story related to sun, moon and stars and the story of the birth of Falling Star. (15 min)
- Class discussion of Falling Star and his importance to Lakota culture. (15 min)
- Draw Lakota constellations on a map of the heavens and discuss which ones are in the elliptic and could be used as a calendar by the Lakota people. (30 min)
- Study a map of the Black Hills and find similarities between constellations and geographic features. Lay them out in some kind of diagram. (30 min)
- Map the journey and timeline of the Lakota people beginning at Spring Equinox and ending at Summer Solstice. (30 min)
- Use knowledge of Lakota constellations to calculate when the Lakotas first started doing a spring journey. (30 min)
- Class discussion of mirroring of heaven and earth and the symbolism of a tipi. (30 min)

Resources

- Handout of selected narratives of the relevant creation stories from Walker and LaPointe.
- Modern star map of sky (to draw on).
- Reference map of Lakota constellations (viewgraph or poster).

- Topographical map of the Black Hills.
- Handout map to draw the journey and timeline on for the spring journey.
- Handout with descriptions of the four ceremonies done on the spring journey.

Assessment

Students could be assessed on their knowledge of Lakota constellations and astronomy, some astronomical concepts such as the movement of stars and how the stars can be used as a calendar.

References

Black Elk, C. A. (1987). Black Hills sacred ceremonies of spring. Reprinted in Ref. 2 as Appendix D.

Goodman, R. (1984). *translated from Charlotte Black Elk*, (pp. 44-45).

Goodman, R. (1992). Lakota star knowledge: Studies in Lakota stellar theology (p. 3). Mission, SD: Sinte Gleska University Press.

LaPointe, J. (1976). Legends of the Lakota. San Francisco: Indian Historian Press.

Walker, J. R. (1983). Lakota myth. (pp. 206-220). Lincoln: University of Nebraska Press.

Developer

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	Constellation (Lakota name)	English translation	Season (sun traverses constellation)	Celestial Importance	Astronomical Importance
<i>Eleven Lakota Constellations on the Ecliptic</i>					
1	Cansasa Ipusye	Dried willow	Winter/Spring boundary	Time when celestial Pipe ceremony was performed to regenerate the earth See story below	Consists of Triangulum and Alpha and Beta in Aries
2	Wicincala Sokowin	Seven little girls	Spring		Identical with Pleiades in Taurus
3	Tayamni	First born of the three relationships	Spring	Symbolizes all life emerging out of hoop of stars	Pleiades is head, Orion's belt is backbone, Betelgeuse and Rigel in Orion is the ribs and Sirius in Canis Major is the tail.
4	Ki Inyanka Ocanku	The Race Track (or Sacred Hoop)	Spring		Large circle of stars including Castor and Pollox in Gemini, Procyon in Canis Minor, Sirius, Rigel, Pleiades and finally Capella and Beta in Auriga.
5	Mato Tipila	The Bear's Lodge	Mid summer		8 of the 12 stars in Gemini forming an irregular rectangle.
6	Anpo Wicahpi	Morning Star			Planet VENUS
7	Itkob u, or Anpo Wicahpi Sunkaku, Or Ihuku Kigle, or Oglececutepi	Going towards Morning Star's younger brother Under went it An arrow game			Star Alpha Bootes (Arcturus)
8	Wanagi Ta Canku	Road of the spirits			Milky Way
9	Nape	The Hand			
10	Zuzeca	The snake			
11	Hehaka	The elk			Five stars in pisces
<i>Three circumpolar constellations</i>					
1	Wicahpi Owanjila	Star which stands in one place			Polaris, the North Star
2	Wakinyan	Thunderbird			13 stars in Draco plus two stars in Ursa Minor
3	Wucakiyuhapi, or Oceti Sakowin, or Cansasa Ipusye	The dipper, or The seven council fires, or Dried willow			The seven stars of the big dipper