Montana Skies

Fast Facts

Curriculum Area: Science
Grade Level: Grade 3
Suggested Duration:

Stage 1 Desired Results

Established Goals

Montana Science 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. **Benchmark 4.6:** Identify objects (e.g., moon, stars, and meteors) in the sky and their patterns of movement and explain that light and heat comes from a star called the sun.

Essential Understanding 1: There is great diversity among the twelve sovereign tribes of Montana in their languages, cultures, histories, and governments. Each tribe has a distinct and unique cultural heritage that contributes to modern Montana.

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 American Indian perspectives frequently conflicts with the stories mainstream historians tell.

Understandings

- The identity of the moon, sun, and stars.
- Familiarity of three or four well-known constellations.
- Montana tribal nations have different stories that explain the origin of the sun, moon, and stars, as well as their own star stories that go with each constellation or star.

Essential Questions

- How can you identify the moon, sun, and stars?
- What is a constellation and how can you identify each constellation?

- What are some of the star stories that different Montana tribal nations have about the objects in the sky?

Students will be able to…

- name the main objects in the sky: moon, sun, and stars.
- name and identify three or four constellations.
- tell or at least recognize different star stories about the constellations of various Montana tribal nations.
- construct a model of a constellation.

Students will know…

- there are objects in the sky such as the moon, sun, and stars.
- a constellation is a group of stars visible from Earth that forms a distinctive pattern and name.
- each tribal nation has their own stories that explain the sun, moon, stars, and constellations.

Stage 2 Assessment Evidence

Performance Tasks

1. Each student will complete a KWL chart to assess their prior knowledge of the subject matter. Students will complete the chart to tell (K) what they already know about the sun, moon, and stars, (W) what they would like to know about the subject matter, and (L) what they learned upon completion of the lesson and activities. Students will also draw sketches of the constellations they learn while hearing and reading the traditional stories that Montana tribal nations have for each constellation.

Other Evidence

- Students will keep a journal of what they have learned during the lesson. Students will also create a poster or brochure highlighting facts about the sun and its relationship to the Earth.

Stage 3 Learning Plan

Learning Activities

Explain to students they are going to be learning about the objects in the sky as well as some of the stories that different tribal nations have about these objects.

To assess the students' knowledge, students will complete the KWL chart. In the first column, K, have students record anything they know about the objects in the sky, whatever knowledge they have about the sun, moon, and stars. In the next column, L, students will write what they hope to learn about this subject during the course of the lesson. After students have completed these two columns, have students share their responses with the class. As students share their "L" column, record their answers so they can be addressed during the course of the lesson.

After assessing the students' knowledge, begin talking about the objects in the sky. Introduce the three objects that will be studied, the moon, sun, and stars. Ask for volunteers to give their own definition of what they think each object is. Allow different students to respond to encourage different ideas and definitions to be shared. After collecting different responses, have students look up the definitions of each item either in their science book or their student dictionary. Have students share what they read. How does this vary from the definitions they gave in their own words? In their journals, have students record each definition.

After discussing each object, discuss the time of day each object can be seen in the sky. Show students their local newspaper and where to find the times for sunrise and sunset (if needed, local newspapers can often be accessed online). Over the next couple of weeks, students need to check their local paper to find the times for sunrise and sunset. These will need to be recorded in their journals daily.

Before students learn about different tribal stories of a few constellations, they will need to learn about the sun and its relationship to the Earth. In small cooperative groups, have students discuss what they know about the sun. They may compare their KWL charts that they just completed. After students have had time to discuss, have each group report to the whole class on what was discussed.

Next students will make a poster or a brochure that tells about the sun. The poster should include various facts including the following:

- Distance of the sun from Earth
- Size of the sun
- Temperatures of the sun
- Other interesting facts

The poster should also contain pictures of the sun. The following Web sites are excellent resources for students to use in their research:

- Stanford Solar Center Comparison Activities The "Solar Folklore" section contains both tribally and non-tribally specific stories.
- National Science Foundation The National Science Foundation provides these links for teacher and student use.

Students may also use their science books or other resource materials they may find in their library. Encourage students to explore the "for students" section on the Stanford Solar Center Web site as it has numerous valuable and interactive activities.

After discussing the moon and the sun and sharing student posters, explain to the students they are going to learn about different stars and groups of stars called constellations. Ask students if they are familiar with what a constellation is and if they can name different ones. Share with students some of the better known constellations. You can show them pictures of these. Some good examples are the Big and Little Dipper, Cassiopeia, Orion, or any others with which they may be familiar.

Next, explain to students the main focus of their constellation study is going to be on the stories that many tribal nations have about not only the sun and moon, but also the constellations. Many of the constellations are named after or have stories originating from Greek mythology but Native people also have their own stories that go with these objects. The students will be listening to and reading a number of tribal stories about stars.

The first story they will hear is an Assiniboine story called "How the Morning and Evening Stars Came to Be." This story can be found online at the Education Northwest Indian Reading Series page, located in the section labeled Level III, Book 7. This story is also in the book titled *How the Morning and Evening Stars Came to Be and Other Assiniboine Indian Stories*. This book was provided to all Montana school libraries from the Office of Public Instruction.

Next, students will have the opportunity to listen to the Blackfeet story about Pleiades and the Six Lost Boys. Show students some pictures of Pleiades so they have a picture in their mind while they are listening to the story told by Clifford Crane Bear. You can find the story online at Virtual Museum of Canada. You will need to scroll down until you reach the story. (there are stories from other tribes on this Web site as well). Click on the link to listen to the story of Pleiades. The transcript of the story is also available to print out and read to the students if you are unable to listen to the story.

While students are listening to the story, have them sketch the story in their journals. This is a time where students really have the opportunity to record whatever images they see as they listen to the story. After the story, have students share their sketches with the class.

The final story students will hear is about the Big Dipper. Students will listen to the Assiniboine story of how the Big Dipper and North Star came to be. Again, prior to reading the story, show students pictures of the Big Dipper. Arrange students in cooperative learning groups. Give each group a picture of the Big Dipper. Have the groups count how many stars are in this constellation and then have each group member draw a quick sketch of the constellation. One advantage of the cooperative groups is if any students are having trouble making a sketch of the constellation, they can have a group member help them with their sketch. Quickly check each student's sketch for accuracy as they will be using this as a pattern to build a model of the constellation.

Now that students are familiar with what the Big Dipper looks like, they will listen to the Assiniboine story, "How the Big Dipper and North Star Came to Be," as told by Jerome Fourstar. This story is found in the book H*ow the Summer Season Came and other Assiniboine Indian Stories*. This book was provided to Montana school libraries from the Office of Public Instruction. (The story, which is a Level 5 Book 14, can also be downloaded from the Indian Reading Series – Education Northwest site. Explain to students that while they are listening to the story they are going to build a model of the Big Dipper. Students will use marshmallows and toothpicks to build the model. While students are listening, they should use their sketch as a pattern to follow to build their model. Be sure to explain to students this is a time to listen and work. This is an independent project and if they are visiting with classmates, they will not be able to hear the story.

After reading the story to the students, allow time for students to share their models if they wish. The models are also a great project to display from the ceiling or on bookshelves.

Extension Activity

As an extension activity, you can show students various constellations. Have students write their own stories about the constellations and how they came to be.

Another activity that students always enjoy is to give them a star chart and have them go outside at night to look for different constellations. Copies of star maps can be found online. You can download the star map for the current month.

Materials Needed

- Notebooks for journaling
- Index cards (for sketching Big Dipper pattern)
- Marshmallows (either miniature or regular size)
- Toothpicks or kabob sticks (depends on the size of marshmallows used)

Resources

Books

How the Morning and Evening Stars Came to be and Other Assiniboine Indian Stories. Helena, MT: Montana Historical Society Press, 2003.

How the Summer Season Came and other Assiniboine Indian Stories. Helena, MT: Montana Historical Society press, 2003.

Web sites

Indian Reading Series – Education Northwest
National Science Foundation
Sky Maps
Stanford Solar Center
Stanford Solar Center Comparison Activities – for Comparison Activities click on For Students and then Comparison Activities
Virtual Museum of Canada