Main Street, U. S. A.

Lewis and Clark

Sextant
Overview: Students who are able to see the night skies are fascinated—especially if they know have the information about the constellations and their stories. This activity will give students an opportunity to find where they are located (by latitude).

Grade Level: Grades 4 and 5. Could be adapted to grade 3, as well as grade 6 and above.

Time Needed: Twenty to thirty minutes.

Connections to Curriculum: Geography, history, astronomy

National Geography Standards
Geography Standard 1: How to use maps, globes, and other geographic tools to acquire, process, and record information to form a spatial perspective.
Geography Standard 2: How to develop knowledge of the Earth to locate people, places, and environment.
Geography Standard 17: How to apply geography to interpret the past.

Objective:
The student will be able to tell the purpose of a sextant.
The student will know that the North Star was used for finding location.
The student will know how to find the North Star.

Kansas, United States, and World History Standard
Benchmark 1: The student understands the significance of important individuals and major developments in history.
Indicator 2 (K): The student uses traditional stories from regions of the United States to help define the region.
Indicator 3 (K): The student describes the observations of the explorers who came to what was to become Kansas.

Geography Standard
Benchmark 1: The student uses maps, graphic representations, tools, and technologies to locate, use, and present information about people, places, and environments.
Indicator 1: (A) The student applies geographic tools, including grid systems, symbols, legends, scales, and a compass rose to construct and interpret maps.

Science Standard 4: Earth and Space Science (DRAFT)
Benchmark 2: The student will observe and describe objects in the sky.
Indicator 1: The student observes the moon and stars.

Reading Standard 2: Literature
Benchmark 1: The student uses literary concepts to interpret and respond to text.
Indicator 2: ▲ The student identifies and describes the setting of the story or literary text.

Writing Standard 1: Writing
Benchmark 2: The student writes expository text using the writing process.
Indicator 4: The student expresses information in own words using appropriate details with simple and compound sentences.
Indicator 15: The student writes grammatically correct sentences that vary in length and structure and makes the reading pleasant and natural.
Indicator 19: The student uses standard writing conventions with accuracy so that meaning is clearly conveyed.
Indicator 20: The student uses writing that includes grammar and usage, which are correct and contribute to clarity.

Materials Needed:
- □ Protractor
- □ Straw (non-flexible)
- □ String (fish line works well)
- □ Weight (fishing sinker [non-lead])
- □ ”How to find Polaris” (North Star)
- □ ”How to make a sextant.”
- □ Masking tape
- □ ”Little Dipper/Little Bear” story

Procedures: Preliminary information for students: When Thomas Jefferson sent Lewis and Clark on their journey West, he was as interested in their methods and their equipment to help them find their way. Jefferson
made sure that Lewis purchased the proper equipment and learned how to use it before he left for the West. He wanted Lewis to be accurate so others could use the information. Lewis and Clark did their best to do what the President wanted.

For Lewis and Clark, just like those people before and after them, calculating latitude was far easier than calculating longitude. Tools to measure the angle between the North Star and the horizon had been around for years. A sextant was used to calculate latitude. Today, we are going to make our own sextant…but first we need more information.


2. Give some easy guidelines for finding the North Star in the United States. You may want to use the handout given. One of the easiest ways to find the North Star is to first find the Big Dipper. Connect the two stars at the end of the bowl (not the handle). Follow an imaginary line formed by these two “pointer stars.” At the end of the handle of the Little Dipper is the North Star.

3. Briefly, review the use of a protractor to find degrees of an angle.

**Sextant Directions**

1. Take the string and tie the weight on one end.
2. Take the other end of the string and tie to the hole on the flat end of the protractor. If there is no hole, tape or tie the string to the point where the vertex of an angle is placed.
3. Now, take your protractor and your straw. Tape the straw on the flat side of the protractor. If the protractor, tape the straw over that hole.
4. To check your latitude, sight through the straw to the North Star. Where the line crosses the protractor, subtract from 90°. That number is your approximate latitude.

**Assessment:** In the student “Passport” have the students write about the following:

1. For what is a sextant used?
2. What star was important in finding latitude?
3. Describe briefly how to make a sextant.
4. Tell how to find the North Star.
Sextant Directions

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• Now, take your protractor and your straw. Tape the straw on the flat side of the protractor. If the protractor, tape the straw over that hole.

• To check your latitude, sight through the straw to the North Star. Where the line crosses the protractor, subtract from 90°. That number is your approximate latitude.
The Little Dipper/Little Bear

The North Star is incredibly important in the history of navigation, because travelers of all backgrounds to keep their bearings have used it. Named Polaris, it is located almost exactly above the North Pole and therefore it seems to be a star that all other stars ‘revolve around’.

The star is also the tail end of the Big Dipper, or little bear constellation. The pot section only has three stars and is missing the star ‘below’ the handle joint. There are then three stars that go out from the pot to form the handle.

According to Greek legends, Callisto was a beautiful huntress that Zeus fell in love with. Zeus’ wife, Hera, got jealous and turned Callisto into a giant bear. Callisto’s son, Arcas, went to look for her. Callisto saw him and ran towards him, but all Arcas saw as a giant bear attacking and got ready to kill it. Zeus instead turned him into a bear too, and put them both into the sky.

The Little Bear/Little Dipper is always in the sky, and is sometimes right side up and sometimes upside down. Because it is always in the sky, and rotates “in place” as the earth does, you can actually learn to tell time (and find latitude) with it based on its location. The ancients did!