Activity 2.3 Patterns of the Stars Teacher

Introduction

Star light, star bright,

First star I see tonight,

I wish I may, I wish I might,

Have this wish I wish tonight.

– Anonymous

Have you ever wished upon a star? You have probably heard the nursery rhyme *Star Light, Star Bright*. In the United States the North Star, or Polaris, is usually one of the first stars we can see as the Sun sets.

In this activity you will learn how we see stars as the light they make travels through space. You will also observe patterns of stars, including the fact that stars are able to be seen only at night.

Equipment

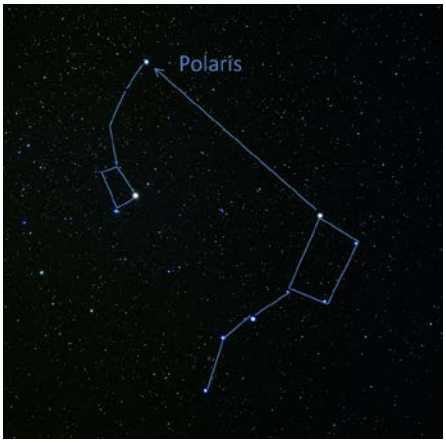
- Launch Log
- iPad® tablet
- iPad Apps:
  - Sky Map, by Mobius Entertainment
  - Popplet Lite app
  - Stage™ app
  - Instructure by Canvas
- Optional: *The Sun Our Nearest Star,* by Franklyn M. Branley
- Aluminum foil, single 4 inch x 4 inch square for each group
- Flashlight, 1 per group
- Sharpened pencil, 1 per group

Procedure

Part 1 – The Night Sky

1. The teacher reads the introduction and leads a discussion about stars. Questions to guide the discussion may include:
   a. How would you describe the stars to someone who has never seen them?
   b. Have you ever wished upon a star?
   c. When have you seen stars in the sky?
   d. What are stars?

2. Students draw the night sky with stars in their Launch Logs. Students may base their drawings on past experiences or their experience observing the moon in the previous activity.
3. Optional: The teacher may wish to host a night sky viewing party at the school. Students and parents could participate in an astronomy night. Students could use binoculars or their eyes to view the stars and other objects in the night sky. The nights around a new moon are ideal for viewing stars, as the reflected light when the moon is visible can make star viewing difficult. The teacher may wish to provide tablets with the Sky Map by Mobius Entertainment app to assist with star viewing. Common features of the constellations Ursa Major and Ursa Minor are generally visible and include the Big Dipper, the Little Dipper, and the North Star (Polaris) as shown below.



4. The teacher guides the students to Activity 2.3 in the Canvas app and has them open and view the 4 minute video entitled “Stars.” Alternatively, the video may be shown to the class instead of on the tablets. The video will only play through a tablet, to play for the class the teacher will project the video from the tablet.
5. After the students have watched the video, discuss different features of stars, including different types of stars and how light from the stars travels great distances through space to our eyes.

Part 2 – Stars and the Sun

6. Student pairs access the app Sky Map by Mobius Entertainment on their tablets. Prior to using the Sky Map app with students, the teacher should familiarize him or herself with the app, including the view settings.
7. The app includes viewing options that are designated by icons. For ease of viewing, the students should have all the icons activated as shown below. The icons will appear orange instead of white when activated. The students will be able to hold up the tablet and see where different objects are located, including the Sun, moon, stars, and planets.

8. The teacher guides the students to find Polaris, the North Star, located at the tip of Ursa Minor, also known as the Little Dipper. If students have a difficult time locating the star, they may use the search feature by tapping on the magnifying glass icon at the top right of the screen and beginning to type Polaris. The Sky Map app will then show the students how to move the tablet to view the star.

9. The North Star is a bright star located above the North Pole of the Earth and has been used for navigation for centuries.
10. The students explore the app inside the classroom and then either view the app while looking out a window or while using the app outside. After the students explore the app, the teacher leads a brief discussion asking students to describe their observations. A key point is that the stars will still appear on the app even though the students cannot see them during the day.
11. To demonstrate why the stars are not visible, the teacher will guide students through the following activity.

a. Each small group is given a flashlight and a square of aluminum foil.

b. The students cover the end of the flashlight with the aluminum foil and fold down the edges to keep it tight.

c. The students use a sharpened pencil to punch out the shape of the Little Dipper into the foil as shown below. Alternately, the teacher may wish to give each student a paper copy of the constellation and a square of cardboard. Students will put the foil between the paper and the cardboard and punch out dots with a push pin. After the constellation is punched out, the foil can be placed on the end of the flashlight.

d. The students turn on the flashlight and observe the "stars" as the light shines through the foil.

e. If the day is sunny, the students then take the flashlights outside and attempt to view the stars. This will be difficult as the intense light from the

f. Sun obscures the faint light from the flashlight "stars." If viewing the light outside is not possible or if it is not sunny, the students can shine an uncovered flashlight at the "stars" created by another group and observe how the faint light is difficult to see.

12. The teacher leads a discussion about the students' observations and guides the students to an understanding that the stars are always creating light in space but are not visible during the day because the bright light from our own star, the Sun, prevents us from seeing the faint light from the stars located far away.
13. Students draw the day sky in their Launch Logs and include just one star, our Sun.
14. Optional: The teacher reads *The Sun Our Nearest Star,* by Franklyn M. Branley or another factual Sun book as a way to reinforce key ideas about the Sun and stars.

Conclusion Questions for Digital Presentation

1. Why can you not see stars during the day?

   Guide students to create a digital presentation to explain why stars cannot be seen during the day. This can be a video response using the tablet camera or apps such as the Popplet Lite or Stage™ apps. Students should include an explanation of why stars are only visible at night.

   Ensure that students understand the stars are still present during the day, but the light from the Sun is so bright that we cannot see the light from the stars.