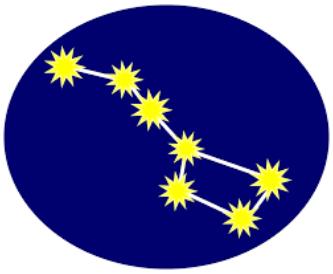
Virginia 4-H STEM @ Home Activity

Underneath the Starry Sky



Supplies:

- Small flashlight
- Red cellophane
- Rubber band
- Cardstock Star Wheel https://www.lawrencehallofscience.org/sites/default/files/pdfs/starwheels/NorthStarwheel.pdf)
- Monthly Sky Map (http://www.skymaps.com/downloads.html)

Age or Grade: Age 9 and up

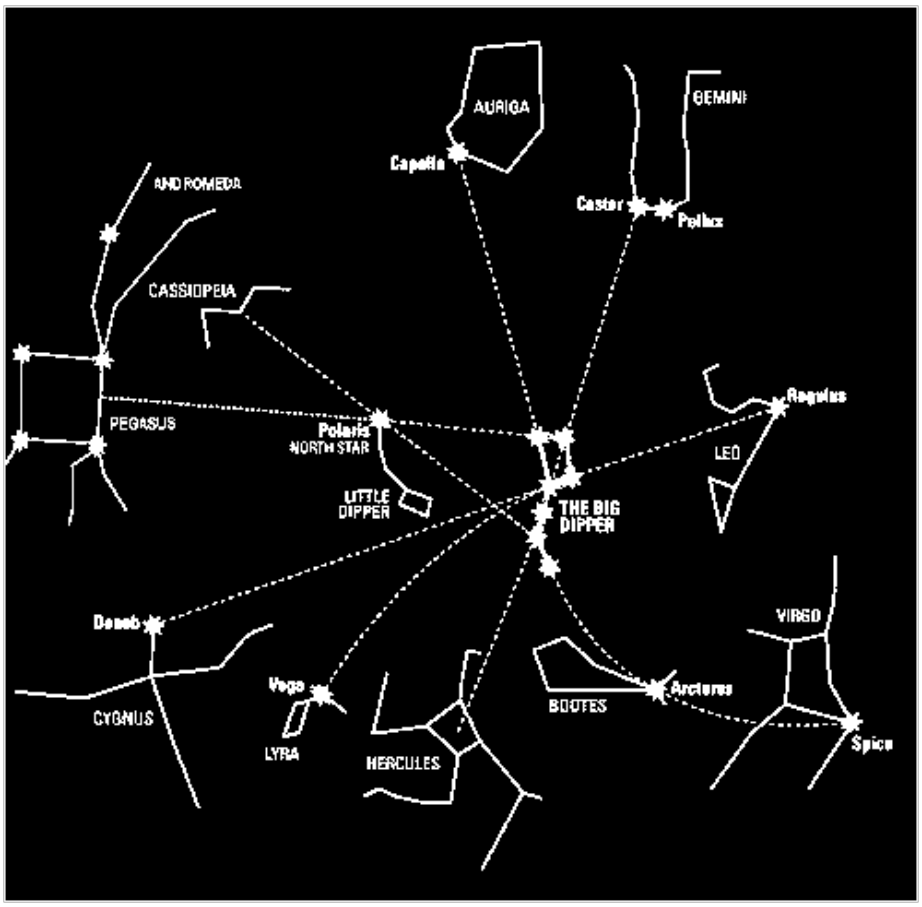
Time: 20-30 minutes

Background: A Constellation is a group of stars that form a recognizable pattern that is traditionally named after its apparent form or identified with mythological figure. Constellations help people to recognize **stars** and other objects in the sky. By looking for patterns, the **stars** and locations can be much easier to spot. The constellations have been used since ancient times to keep track of the calendar and help sailors and travelers navigate at night. Modern astronomers divide up the sky into 88 chunks or constellations which can include stars, nebulas, galaxies and other celestial objects.

Project Goal: Locate the North Star, and determine directions (North, South, East, West) Identify major constellations. Learn to use a star wheel and star maps.

What to Do:

1. Wait until a clear night. Moonless nights are better for viewing constellations, but viewing the moon at different stages is also fun and educational.
2. Consult the evening sky map for May or June to locate any planets, meteor showers visible. Times for viewing are listed in Universal time. To convert to Eastern Daylight time, add four hours.
3. Cut out and construct your Star Wheel and adjust it to the correct date and time.
4. Cover your flashlight with red cellophane, using a rubber band. This will allow you to look at your star maps and find your way around, without ruining your night vision.
5. Turn off any outdoor lighting, if possible. Move to an area that is free from trees and tall structures.
6. Allow your eyes to adjust to the darkness for 5-10 minutes. This is a good time to sit quietly and listen for birds, frogs and insects.
7. Start by locating the Big Dipper. It looks like a ladle or cup with a long handle. The big dipper is actually part of the Ursa Major constellation. Shapes that are easily recognizable in the sky but are not constellations themselves are called asterisms.
8. Notice that the two stars that form the far side of the cup point to the North Star, which is on the end of the Little Dipper, which is part of the Ursa Minor Constellation. This will help you find the north star. As seen in this diagram:



http://www.fortworthastro.com/beginner2.html

The North Star or Polaris, holds nearly still in our sky while the rest of the northern sky moves around it. That's because it's located almost at the north celestial pole, the point around which the entire northern sky turns. Polaris marks the way due north.

9. As you face Polaris, stretch your arms sideways. Your right hand will point east, and your left hand will point west. Your back will be facing the south
10. Using the diagram, now find other circumpolar constellations—these are the constellations that rotate around the north star throughout the night.
11. Once you have become familiar with the stars in the north sky, use your star wheel to find other constellations, planets, meteor showers and other events.

Reflect:

1. What was the first star or constellation that you found?
2. What was the hardest constellation to find? Why?
3. How can you link the different constellations or other bodies that you see? Can you draw a map? Take a photo? What is the best way to capture them to explain to your family or friends?

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Apply:

1. Why is it important to know about the sky and stars?
2. What careers could be linked to astronomy?
3. What ways have we used the night sky over time to help us? What ways could you use the night sky to help you?

Going Further:

Travel at night can be confusing and disorienting. Imagine a time before GPS devices and telephones. Without a compass, the North Star might help you determine what direction you are traveling in. According to American Folklore, the song "Follow the *Drinking Gourd"* song was supposedly used by an Underground Railroad operative to encode escape instructions and a map. These directions then enabled fleeing slaves to make their way north from Mobile, Alabama to the Ohio River and freedom A "drinking gourd" is a hollowed-out gourd used by slaves (and other rural Americans) as a water dipper. While the song was not published until after the Civil War, and we can't be sure if of the accuracy of the story, it is easy to imagine that escaping slaves may have used the stars to guide their way to freedom.

Hold a monthly star gazing party with your family and consider camping outside. Hold a competition to see which family member can find the most constellations. Keep track of other astronomical events such as meteor showers and planet sightings. Research the stories behind the constellations or have fun making up your own!
To learn more about the phases of the moon, go to
https://nightsky.jpl.nasa.gov/docs/MoonPhaseCardsASP.pdf

Notes for Parents or Helpers:

Using a flashlight with a red lens or filter on your flashlight will allow you to look at the star charts and see in the dark without ruining your night vision. If you live in a city or urban area, light pollution may prevent you from seeing all but the brightest stars. This is a perfect activity for your next campout in the country.

Here is a link to a more detailed 4-H project: https://www.kansas4-h.org/events-activities/volunteer-trainings/spacetech/docs/Astronomy_Its_Out_of_This_World.pdf

There are many additional resources available through NASA.
Go to https://nightsky.jpl.nasa.gov/planner.cfm.

To Learn more about the folksong "Follow the Drinking Gourd" and the history of the Underground Railroad go to https://amhistory.si.edu/ourstory/activities/slavelife/
Or read **Follow the Drinking Gourd** by Jeannette Winter

For more information on how Sailors navigated, watch this fun video from "the Curious Engineer." https://www.youtube.com/watch?v=4DlNhbkPiYY

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