

Constellations

Part I

Purpose

The purpose of these activities is to learn about constellations.

Students will be able to

1. Define constellation, and related terms.
2. Understand the history of constellations.
3. Recognize and name some famous constellations.
4. Reflect on and write creatively about constellations.
5. Model constellations.
6. Use constellations to practice angle measurement.

Important Vocabulary (key terms in bold)

star	constellation	celestial sphere	pointer stars
asterism	ecliptic	zodiac	astrology
astronomy	galaxy	light-years	magnitude
luminosity			

What is a Constellation?

Students will read “Constellation Basics” as an introduction to constellations and their history. They will write out definitions of terms underlined in the article. (Note: the document below contains links to an astronomy glossary.)

*(** See below for printable activity sheets.)*

Hands Up!

Students use the astronomical system of degrees to measure objects on the horizon, in preparation for locating stars in the night sky. (Note: Use the “Hands Up!” lesson, which includes an activity sheet, from the *Thursday’s Classroom* website: <http://www.thursdaysclassroom.com/13oct00/teach4.html>.)

Researching Constellations

Students choose, research, and report on specific constellations. Students should complete both a written report (approximately three pages) and an oral report, possibly accompanied by a PowerPoint presentation. Be sure to correctly cite all source materials!

Star Gazing

Students spend time star gazing, and journal about it. Include such things as feelings/thoughts, creative writing (e.g. stories, poems, etc.), questions. This activity should be completed over five to seven days.

So, You Wanna Be a Star...

Students read legends/short stories about the constellations, and create a short play from them. If possible, students perform the play for a live audience. (Note: Young children would be a good audience!) Otherwise, students record their performance onto video tape.

Extra Resources

The following online resources might be helpful for lessons about constellations:

1. <http://cas.sdss.org/dr2/en/proj/teachers/kids/constellation/tips.asp#find>
2. <http://mywebpages.comcast.net/bondono2/iconst.html>
3. <http://www.skymaps.com>
4. <http://skyandtelescope.com/>
5. <http://www.astro.washington.edu/larson/Astro101/LecturesFraknoi/astro101s01.html>
6. <http://www.middleschoolscience.com/constellationguide.pdf>
7. http://cse.ssl.berkeley.edu/lessons/indiv/beth/beth_intro.html
8. http://hea-www.harvard.edu/ECT/the_book/Chap4/Chapter4.html
9. <http://www.astronomical.org/portal/modules/wfsection/index.php?category=1>
10. <http://www.esu8.org/resources/SMART.html>
11. http://www.mtmary.edu/artedutech/TU_GRADES_6.html
12. <http://fc.lcdsb.on.ca/~p.caskanette/JPII/gr9ast.doc>

Constellation Basics

When looking up at the stars, one can see discernable patterns in the sky called asterisms, which are located within constellations. Different cultures of past and present acknowledge different patterns, and many different stories are told of their significance. The ancient Greeks first envisioned many of the constellations we use today, most of which are still known by their original Latin names. While looking up at the night sky, it can be very difficult to identify any of the constellations; the sky appears to be a puzzling clutter of hundreds of points of light. Most constellations bear little resemblance to their designations, and the asterisms often differ from source to source. Some of the most prominent and easily recognizable constellations are the Big Dipper (an asterism within the constellation Ursa Major) and Orion the Hunter. To help identify other constellations, we can use pointer stars to find their locations. The best example of this is using the two right stars of the Big Dipper's bowl to point up to Polaris, the North Star. In 1930, astronomers divided the entire sky into 88 constellations, which are officially recognized today. Some cannot see all of the constellations because they are never exposed to the stars in a certain celestial sphere. (In Canada, for instance, the Earth literally blocks the view of the southern sky. The constellations of the southern celestial sphere were not envisioned until European explorers traveled to the southern regions of the world during the 17th and 18th centuries, and most are named after important inventions of that time period, such as Antlia the Air Pump and Caelum the Chisel.) Constellations can be detected with the help of sky atlases or star charts, which show the positions of numerous stars and the divisions between the constellations. Star charts can be very simple and show only the brightest stars, or they may go into much more detail and show small portions of the sky with thousands of plotted stars. There are also many computer programs that plot the positions of millions of stars. With a good atlas, a dark sky, and some patience, it is not difficult to identify many of the constellations.

Ancient Civilizations and the Night Sky

The stars and the patterns they create are visually fascinating and can be used to help with orientation. Although the constellations and asterisms have limited significance to us today, to ancient civilizations, understanding the patterns in the sky was an important aspect of life. The stars (especially the North Star) helped early explorers navigate their ships across the oceans. Primitive calendars were created using the motions of the stars and as a result, were an essential component in the cultivation of a successful crop. In ancient Egypt, the arrival of the star Sirius (in the constellation Canis Major) warned of the annual flooding of the Nile. Also, many of the asterisms were important culturally, telling stories of the past. Believing that the most significant heroes and creatures were placed into the heavens once they perished, the Greeks

had extensive constellation/asterism stories featuring mythological gods, human heroes, and other creatures. Two of the most well known Greek heroes represented in the sky are Orion the Hunter and Hercules the Warrior.

The Ecliptic and the Zodiac

As explained earlier, the Earth's orbit causes the Sun to follow an arced path through the sky, called the ecliptic. All the planets and moons of the solar system also follow the ecliptic, because they all orbit the Sun on essentially the same horizontal plane (Pluto deviates furthest from the ecliptic; its orbit is inclined at 17 degrees). For this reason, planetary conjunctions (the close alignment of two or more planets) are regular events in our sky. The ecliptic was an important component of ancient astronomy and was the foundation for the zodiac, the collective term for the twelve constellations through which the ecliptic passes. The Sun, however, actually passes through thirteen constellations, but it is believed that the twelve were chosen because of the twelve months of the year. The constellations of the zodiac remain well known today because of astrology. Astrologers use a qualitative approach to study the unique relationships between the planets and the stars, and their supernatural effects on life on earth. Although not a science, astrology helped advance the field of astronomy because astrologers took such detailed records of the night sky.

This (slightly modified) information taken from

http://www.ioncmaste.ca/homepage/resources/web_resources/CSA_Astro9/files/html/module1/lessons/lesson2/const_webquest.html