GRADES K–2

TIME
30–45 minutes

CONSTELLATION VIEWER

Science

English / Language Arts

CHILDREN'S MUSEUM INDIANAPOLIS®

CONSTELLATION VIEWER

The Children's Museum's lessons are designed to weave classroom experiences and museum education together. All lessons are interdisciplinary and can be used as individual classroom experiences or in combination to create a cohesive unit. Lessons are optimized when used in connection with museum field trips.

Students will discover the science behind stars and how to create a **constellation** in their very own home. As students journey through the cosmos, they will explore how their ancestors saw stars and understand how different types of stars make up the night, and day, sky!

FOCUS QUESTIONS

- What is a constellation?
- What are different types of stars?
- Why are constellations only visible at night?

INDIANA ACADEMIC STANDARDS

Science: K.ESS.2, 1.ESS.1

English/Language Arts: K.RL.1, 1.RL.1

OBJECTIVES

Students will:

- Learn how to view stars.
- Identify familiar constellations.
- Build a constellation viewer.

MATERIALS

- Paper (cut into squares just slightly bigger than the end of a cardboard tube)
- Pencil
- Flashlights
- Cardboard tubes
- Tape
- Scissors

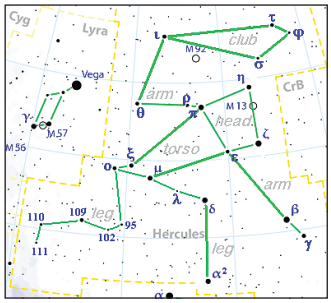
Optional Materials:

- An age-appropriate book of Greek mythology
- Pictures or illustrations of various constellations

Photo Credits: Girl looking through telescope (Cover), The Children's Museum of Indianapolis; Museum at Night (above), The Children's Museum of Indianapolis; Materials (above), The Children's Museum of Indianapolis; Hercules rendering (page 3), AugPi at the English language Wikipedia / CC BY-SA; Procedure Steps (page 3), The Children's Museum of Indianapolis; Bear constellation (page 4), elen31 / Adobe Stock; Venus (page 4), Brocken Inaglory / CC BY; Jupiter (page 4), NASA/JPL-Caltech/SwRI/MSSS/Kevin M. Gill / Public domain; Aldebaran, Giuseppe Donatiello / CC0

Build a Constellation Viewer

PROCEDURES



Hercules

1. To begin, ask students; have they ever gone outside and looked at the stars? What have they observed and noticed in the sky? Are the stars the same every night?
2. Share the word **constellation**. Ask if any students have ever heard the word before, or if they can name/describe any constellations. Explain that constellations are imaginary shapes in the night sky made by connecting stars like connect-the-dots. Cultures all over the world found constellations in the sky in the past, and most of today's modern constellations are based on those found in Ancient Greece. Introduce the constellation Big Dipper and explain that it can be seen every night in the northern sky, weather permitting.
3. Share that not all constellations are visible every night. The Big Dipper and its companion The Little Dipper are, but many constellations change with the seasons. Orion, for example, is a winter constellation, while Hercules is a summer constellation.
4. Discuss with students that there are many different types of stars. The most visible one in the sky is not seen at night, but in the day and it is the sun. However, stars come in many different shapes, sizes, and colors. Refer to the information on page 4 to expand on this topic before students create their constellation viewer.
5. Explain that they will be building constellation viewers that will allow them to project a constellation of their choice by using a flashlight. This will allow them to see the constellation day or night, rain or shine, no matter the season! Each student can pick one constellation to turn into a viewer.

HELP ME STARGAZE!

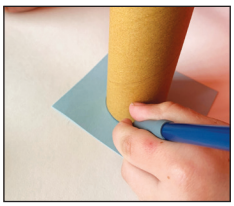
Every month you can download an updated sky chart! Depending on where you are, you can download a Northern, Southern, or Equatorial map that shows you exactly what you are gazing up at. You won't ever have to guess what planet, star, or constellation has caught your eye. You can also plan your sky gazing around predicted meteor showers to catch those "shooting" stars. You don't need a degree or fancy telescope to stargaze. If you are out looking at stars, you're already an astronomer!

Visit: www.skymaps.com/downloads.html

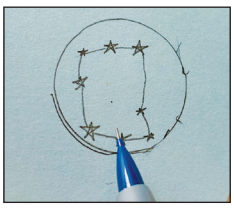
---

1 Find a picture online of their favorite constellation.

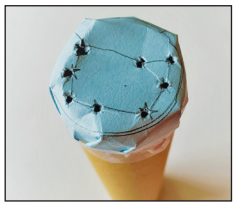
2 Trace the end of a cardboard tube onto a piece of paper.



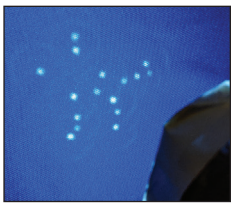
3 Draw the constellation inside the traced circle, making the stars nice and big. Don't forget to connect the dots!



4 Tape the paper tightly to one end (make sure not to leave any openings!), and poke holes for each of the stars on the constellation.



5 Turn the lights out and shine the flashlight through the open end of the tube onto a surface to view the constellation.

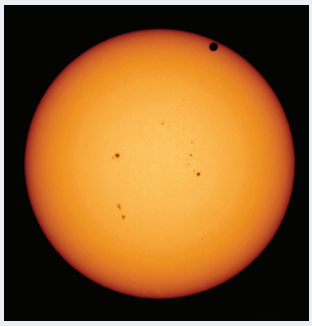


Different Cultures, Different Constellations

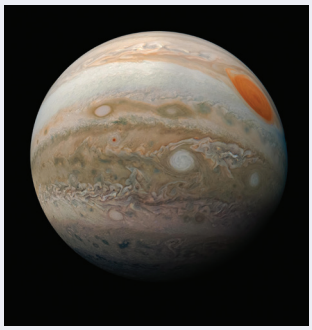
Cultures all over the world saw shapes in the sky and told stories about them. The Big Dipper is made of prominent stars and was a popular pattern across the northern hemisphere. Ursa Major, the Great Bear, which includes the Big Dipper is an Ancient Greek tradition, but various Native American cultures also saw a bear in the same stars. To the Irish it was a plow, to the Norse, "Odin's Wain," meaning Odin's cart or wagon. In Shinto tradition, the Dipper is called Amenominakanushi, named for the greatest of Kami, the spirit who created the universe.

WHEN IS A STAR NOT A STAR?

When it's a planet or a shooting star! Venus is sometimes called the "evening star" because it's so bright it is one of the first points of light shining as the sky gets dark. Planets don't make their own light, but reflect the Sun's light. Venus is named after the goddess of love and beauty. Named so because people often see it as the most beautiful object in the sky. Just next to Venus, but not as bright, lies the planet Jupiter. A shooting star, or **meteor**, happens when a tiny space rock, called a **meteoroid**, enters Earth's atmosphere and burns up. When this happens, it looks like a streak of light across the sky. Meteor showers happen when Earth passes through a group of meteoroids.



Venus



Jupiter

VOCABULARY

- **Star**
- **Constellation**
- **Meteor**
- **Meteoroid**

FINDING CONSTELLATIONS

Aldebaran

A couple of constellations are easy to find even for an amateur stargazer. The Big Dipper is prominent in the northern sky all year round (from the northern hemisphere), and Orion is hard to miss in the winter with his bright belt of three stars. Other constellations are made of dimmer stars, but the Big Dipper and Orion can help point the way to some of them. Following the line of the last two stars in the Dipper will lead to Polaris, the North Star, which is the first star in the handle of the Little Dipper, or Ursa Minor. Following the arc of the Big Dipper's handle points to a red star called Arcturus in the constellation Bootes, the herdsman. Finally, continuing the line of Orion's belt out in front of him, you will find another red star, this one called Aldebaran, that is in the lower left horn of Taurus the bull.

NORTHERN AND SOUTHERN HEMISPHERES

The designation of seasonal constellations is relative to one's hemisphere. Orion is only a winter constellation in the northern hemisphere. He is a summer constellation for the southern hemisphere. Their opposite is circumpolar constellations, which are only ever visible from one hemisphere. The Big and Little Dippers are both northern circumpolar constellations. There are only three others: Cassiopeia, Cepheus, and Draco. The Southern hemisphere has only three: Crux, or the Southern Cross, Carina, and Centaurus.