



*Moonset over Travelers' Rest*

# Star Explorers

You've probably noticed that the sun is setting earlier and earlier each day. That means we're getting closer and closer to the **winter solstice** on December 21, the longest night of the year. Since it's now dark well before bedtime, it's the perfect time for stargazing—just be sure to bundle up! To see the most stars, choose a night with no clouds and find a place with few human lights. It's even better if you go when the moon is only a sliver (mid-December). If possible, give your eyes time to adjust: try not to use any white lights for 30 minutes before, and put red tape or cellophane over your flashlight to create a softer red light instead.

As you look at the sky, remember that this is also the season of storytelling. Travelers' Rest sits within the homeland of the Bitterroot Salish, who traditionally tell stories only in winter, after the first snow has fallen. Many of the other tribes who passed through this area also have winter storytelling traditions.

## ***What is the Winter Solstice?***

The earth rotates the sun. And it is also spinning on a tilt. The winter solstice in the Northern Hemisphere (that's us!) happens when the Earth is tilted as far **AWAY** from the sun as possible. This means that we see the sun much lower in the sky, and it is up for less time. Since the southern hemisphere is as **CLOSE** to the sun as possible, it is the longest day of the year there—and the middle of summer!

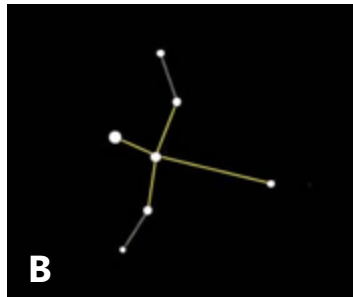


# What is a Constellation?

There are hundreds of billions of stars—and that's just in our **galaxy**, the group of gas, dust, and stars known as the **Milky Way**. However, humans can only see a few thousand stars with the naked eye, not using a telescope. When people look at these stars, they often see patterns. Many cultures have names for these patterns, and tell stories about why these stars are arranged in this particular shape.

About a hundred years ago, a group of **astronomers** (people who study space) agreed on official names for 88 of these patterns, called **constellations**. They mostly used the classical—Greek, Roman, and Middle Eastern—names for the constellations. They are animals, gods and goddesses, objects, and more.

## Can you match the constellation to its name?



1. Cygnus (Swan)
2. Ursa Major (Great Bear)
3. Orion (Hunter)



Dakota/Lakota star map © 2012, Annette S. Lee & Jim Rock; [www.sciencefriday.com/articles/indigenous-peoples-astronomy/](http://www.sciencefriday.com/articles/indigenous-peoples-astronomy/)

By agreeing on these shared names, scientists around the world have a common way to talk about regions of the sky. However, this does not mean that the stars are actually close to each other in space—just that they look like they are from Earth. The stars can be very different sizes, distances, and temperatures. These factors can also affect how bright or dim they appear to us.

As the earth rotates around the sun over the course of a year, we end up looking at different directions in space. This means that you see different constellations at different seasons. Some cultures also tell stories about why certain shapes appear at certain seasons, or seem to “change” across the sky.

# Constellation Viewers

Your kit comes with enough materials to make two constellation viewers, which are great for practicing constellation identification—or just viewing star patterns if it's too cold to go outside. Start with Orion, Cassiopeia (kass-ee-uh-pee-uh), or Pegasus if you want some constellations that are clearly visible at this time of year.

*(The instructions look complicated, but we promise: it's easy!)*

## Make Your Own Viewer



[www.literaryhoots.com/2015/05/constellations-astronomy-for-kids.html](http://www.literaryhoots.com/2015/05/constellations-astronomy-for-kids.html)

1. Cut the **black construction paper** into four equal pieces. Cut out the **constellation pattern** you've chosen, using the dotted line.
2. Glue or tape the constellation pattern to one of the pieces of construction paper. Put this on the **square of cardboard**, and use the **paper clip** to punch holes where the stars are located.
3. To make the construction paper easier to fold over the tube in the next step, trim it until it's a rough circle. Make cuts from each side of the construction paper inward, until you're almost at the constellation pattern, so you have flaps.
4. Center your constellation pattern over the the top of the **toilet paper tube**, and fold down the construction paper flaps so that they wrap securely around the tube.
5. Use the **rubber band** or tape to secure the paper to the tube.
6. Look into the tube, and you can see the light shining through as the constellation! (You might want to label or decorate the tube to help you remember.)



*Orion, from the inside of the viewer.*

See the last page for a challenge to design your own constellation! You can make a viewer for it too, by punching the holes in a blank circle of white paper.



<http://mommaowlslab.blogspot.com/2013/09/diy-constellation-tubes.html>

# The Bunched Stars

Different cultures have different stories about the sky—and winter is the time to tell them. A Blackfoot legend tells the story of a cluster of stars that's very visible in the winter: **The Bunched Stars**, or Pleiades. See if you can find them in the sky (or use your constellation viewer) and read the story aloud:

In a camp of our people there was a family of six boys. Their parents were very poor. Every spring the people went out to hunt for buffalo. At this time of year, the buffalo calves are red, and their skins are much desired for children's robes. Now as the parents of these children were very poor and are not able to do much hunting, these boys had to wear brown robes or those made of old buffalo skins. As the children grew up, they were constantly reminded that they had no red robes. The other children of the camp sometimes made fun of them because of this. So one day one of the boys said to his brothers "Why is it that we never get any red robes? If we do not get any next spring, let us leave the camp and go up into the sky." Then the boys went out to a lonely place to talk the situation over. Finally they agreed that, if they did not get red robes the following spring, they would go up to the sky country.

The spring hunting-season passed, but no red robes came to the boys. Then the oldest brother said, "Now I shall take you all up to the sky." The fourth brother said, "Let us also take all the water away from the people, because they have been bad to us." Another brother said, "We must take our dogs with us." Then the oldest brother took some weasel-hair, placed a little on the backs of his brothers and upon their dogs. Then he took another bunch of hair, put it first in his mouth, then rubbed it on his palm. "Now shut your eyes," he said. Then he blew the weasel-hair up, and, when the brothers opened their eyes, they found themselves in the house of the Sun and Moon. The Sun, who was an old man, and the Moon, who was his wife, said, "Why have you come?" "We left the earth," said the oldest brother, "because the people never gave us red robes. All the other children had red robes to wear, but we only had brown ones. So we have come for your help." "Well," said the Sun, "what do you want?" The fourth brother said, "We should like to have all the water taken away from the people for seven days." Now the Sun made no answer to this; but the Moon took pity on the poor boys and said, "I will help you; but you must stay in the sky."

The Moon pitied the boys so much that she cried. She asked the Sun to aid her in taking away the water from the people; but the Sun made no answer. She asked him seven times. At last he promised to aid her. The next day on the earth was very hot. The water in the streams and lakes boiled, and in a short time it all evaporated. The next night was very warm and the moonlight strong. When the water was gone, the people in the camp said, "Let us take two dogs with us to the river bed." When they came to the bank of the river, the two dogs began dig a hole in the side of the bank. When they had dug a long time, water came out of the hole like a spring. This is the way springs were made. Even to this day, people have great respect for their dogs because of this. The days were so hot, the people were so hot, the people were forced to dig holes into the hills and crawl into them. They would have died if they would have remained on top of the ground. When the water in the springs gave out, the dogs made other springs.

Now the leader of the dogs was a medicine dog. He was old and white. On the seventh day he began to howl and look at the sky. He was praying to the Sun and Moon. He explained to the Sun and Moon why it was that the boys got no red robes. He asked them to take pity on the dogs below. (This is why dogs sometimes howl at the moon.) On the eighth day the Sun and Moon gave people rain. It was a great rain, and it rained for a long time. The six boys remained in the sky, where they may be seen every night. They are the Bunched Stars (Pleiades). **A-ne'ma-ye ek'ko tsis**

*Source: Clark Wissler and D.C. Duvall, Mythology of the Blackfoot Indians, as transcribed in Blackfeet Skies.*



Looking up, you will see a small, bunched cluster. There are seven stars, but one is much fainter than the rest. [earthsky.org/todays-image/photos-pleiades-seven-sisters](http://earthsky.org/todays-image/photos-pleiades-seven-sisters)

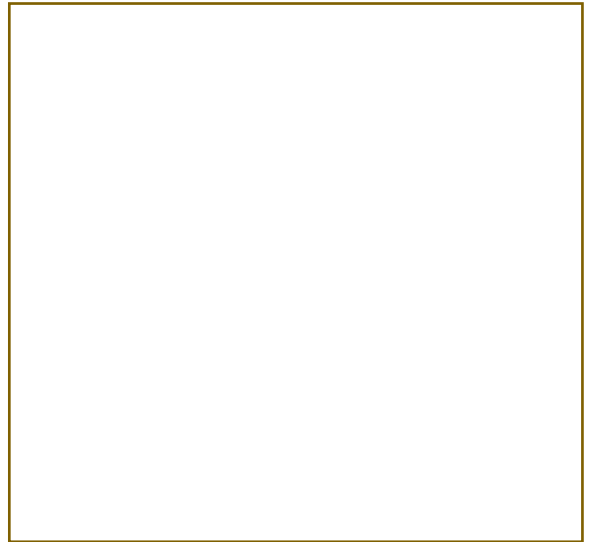
# Prize Challenge

*Each Trekker Kids packet this winter includes one activity for you to show to park staff. Bring in all three completed challenges by the end of January and win a prize!*

## Create a Constellation

**Create your own star pattern—you can use the glow-in-the-dark stars in this kit for inspiration. Write, draw, or tell the story of how these stars ended up in the sky.**

***My Constellation Story:***



**My Star Pattern**

*Want more space-related activities? Search **Junior Ranger Night Explorer** online for a printable packet from the National Park Service, geared to ages 5-12.*