

# Night Sky Exploration



For thousands of years humans have studied the night sky and found shapes in the stars. Constellations are groups of stars that form a recognizable pattern. They helped ancient humans find their way, and today they help astronomers navigate around the starry sky and locate particular galaxies, nebulas, and other space objects. They are also fun for backyard stargazers to find and enjoy. Learn more about constellations and the night sky with these activities.

## ACTIVITY 1: MAKE A CONSTELLATION VIEWER

Locate the following common household materials:

- Used paper towel or toilet paper tube
- Construction paper or several sheets of normal paper
- Tape or glue
- Rubber band
- Scissors
- Ruler
- Thumb tack or similar sharp object

**STEP 1:** Print the page with the constellation template circles. Cut out the circles, and cut out 4 circles in construction paper approximately 4 inches in diameter. Construction paper or another thick paper works best, but if you don't have construction paper you can use 2 layers of normal printer or notebook paper instead of one layer of construction paper.

**STEP 2:** Glue or tape each constellation template circle on top of a construction paper circle. If you used glue give it time to dry. Place the two-layered circle on a carpet or piece of cardboard. Poke a hole through both sheets of paper on top of each dot representing a star in your constellation template using a thumbtack.

**STEP 3:** Once all of your holes have been punched, center your constellation over the end of a toilet paper or paper towel tube. Place the constellation template with the printed side down towards the tube. Rubber band your paper circle over the end of your paper towel or toilet paper tube. Hold it up to the light and look through your tube to see the constellation revealed!

Use your constellation viewers to help you find and identify constellations in the night sky.

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## ACTIVITY 2: TAKE A STAR TOUR

To start your star tour find west (locate where the sun sets if you're not sure which direction is west). Start your tour around 9 p.m.

**Venus:** Look to the west/northwest. Look for a very bright "star" low in the sky. This "star" is actually Venus, the second planet from the sun! Venus is the brightest object in the night sky besides the moon.

**Orion:** Look to the left of Venus low in the western sky and look for Orion's distinctive belt of 3 stars in a row. Now look above and below his belt to find the rest of him. Orion can help you find many other constellations in the winter sky.

**Sirius:** Trace the three stars in Orion's belt down and to the left and follow that line until you hit a bright star. This is Sirius, the brightest star in the night sky. Compare Sirius to Venus and note that Venus is brighter than even Sirius, the brightest star. Now that you've seen Venus's stunning brightness you'll always recognize this bright planet in the night sky! Be careful however; Jupiter is almost as bright as Venus and easy to mistake. To see Jupiter in April look for a bright "star" in the southeast sky before dawn.

**Big Dipper:** Look to the north to find the Big Dipper. The dipper will be high overhead and will look as if it is upside down. The two stars that are highlighted in yellow are called the pointer stars. Follow a line through these stars down towards the ground. The next bright star that you encounter is Polaris, the North Star, and part of the Little Dipper. Now that you can find Polaris you can always find north on a clear night.

**Cassiopeia:** Continue following the same line from the Big Dipper, through Polaris, towards the ground. Below Polaris look to the left to find the w-shape of Cassiopeia. Most constellations are only visible in certain seasons, but Cassiopeia, the Little Dipper and the Big Dipper can be seen all year round.

**Boötes:** Follow the arc of the handle of the Big Dipper away from the cup part of the dipper. Continue this arc until you encounter a bright star. This is Arcturus, the brightest star in Boötes. Look for the kite-shape of Boötes laying on its side stretching towards the north from Arcturus. There are many different stories about this constellation. In one story Boötes was a farmer who invented the plow and was placed in the sky as a reward for his ingenuity, which made farming faster and helped farmers to grow more food.

## ACTIVITY 3: CREATE YOUR OWN CONSTELLATION

Create your own constellation. Find a pattern of stars that looks like a shape to you. Your constellation can be anything you want: a person, an animal, an imaginary creature, or even a cool nature object like a tree or a waterfall.

Constellations typically have stories or legends that have been passed down through the ages that explain how that person, creature, or object ended up in the night sky. Create your own story about why your constellation is in the night sky and how it got there. Share your constellation and its story with a buddy.

