

GET OUT!  
Kids' Club

# The Night Sky: A Celestial Treasure Hunt

All Ages

*Twinkle, Twinkle Little Star, how I wonder...* The night sky has always inspired curiosity, ignited the imagination and invited enchantment whenever we wish upon a star. Stargazing is one of those simple activities that is loaded with potential. There's an entire universe full of questions to be explored. Just imagine how many families throughout time have gazed at these same stars.

## Stargazing Basics

### Where to go?

- \* Your backyard or nearby green space is a great place to start as it is convenient. Once you've become familiar with the night sky, get the full experience by escaping from the city lights. Head for high ground, the higher your elevation, the clearer the sky. For a special experience, visit a Dark Sky Preserve.

<https://www.caasco.com/blog/Local/the-best-places-for-stargazing-in-ontario>

- \* Minimize light pollution as much as possible, for example, turn off porch lights, and choose a moonless night.

### What will you need?

- \* Eyeball astronomy is dandy and free! A simple pair of binoculars however, can certainly enhance your gazing.
- \* Make sure everyone will be comfortable for the duration. Lying on a blanket is a great way to view the night sky. Reclining lawn chairs are comfortable.
- \* Dress warmly, even summer evenings get chilly.
- \* If you are using a flashlight, protect your night vision. Cover the lens with a red filter (stretch a balloon over the lens).



### What to look for first? (Find daily sky news and more at <https://earthsky.org/>)

- \* Start with a meteor shower. Shooting stars are just downright exciting. The Earth passes through clouds of space debris and bits (meteors) enter the earth's atmosphere, and burst into flames (shooting stars). Predictable annual meteor showers, like the Perseid Meteor shower in August, make it easy to plan a successful outing. Learn more at <https://www.asc-csa.gc.ca/eng/astronomy/tips-tricks/perseids.asp>
- \* Check out the Moon. Our nearest cosmic neighbour, the moon, is the easiest object to see without binoculars or a telescope. If you plan to use binoculars or a telescope, practice with the moon.
- \* Search for spacecraft - satellites, a space shuttle or the International Space Station (ISS). A steady light cruising across the sky is probably a manmade object orbiting Earth.
- \* Learn to locate a few constellations and build from there. It will be hard to stop. See the *Make a Constellation* activity below to get started. There are plenty of resources: websites, books and smartphone apps to help you roam the night sky. Download a free planetarium app like Star Chart, which allows you to hold your phone up to the night sky and map stars and planets. The constellations have inspired wonderful stories. Find some here <http://www.ontarioparks.com/parksblog/tag/constellations/>

**Tip:** While summer evenings entice us outside, winter evenings are great for stargazing. It is dark earlier, there's less moisture in the air, which can obscure starlight, and there are no leaves on the trees, which means more visible sky. And there are NO mosquitos!



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naturehood@peptbo.ca  
www.peptbo.ca  
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# Star Gazing Activities

## The Moon

The Moon offers much to see. As twilight deepens, you can often see the dark side of the Moon glowing. Sunlight reflecting off the Earth's clouds and oceans, an effect called earthshine, causes the glow.



Binoculars can reveal craters, mountains, and lava-filled seas. Each evening there will be different features to see with the rising and setting of the sun across the moon's surface. A full moon is bright, too bright to really see the details of the lunar landscape.

A great family activity, well suited to younger stargazers, is to have each person draw a sketch of the Moon as it looks through binoculars. When everyone is finished, compare the drawings for some amusing entertainment. This activity also helps develop good observing skills.

## The Milk Way

Summer is a great time to browse the sky with binoculars. The Milky Way, in the southern sky, is a great place for a celestial hunt with binoculars. Begin low in the south with the easy-to-spot Teapot (in the constellation Sagittarius) with steam rising from the spout. The steam contains the bright Lagoon Nebula, which shows up as a small cluster of stars with a diffuse glow surrounding it. Above this look for a second glow, the Trifid Nebula.

Continue with your binoculars and follow the Milky Way upward, toward the northeast. You will pan across many bright star clouds, dark nebulas (clouds of dust and gas blocking the starlight behind), and star clusters. In the 1700's Charles Messier charted 109 objects in the Milky Way to avoid mistaking them for comets. Find a star chart that plots the locations of the object in the Messier catalogue. Challenge each other or work together to locate as many of the Messier objects in binoculars as you can in one evening.



## Make a Constellation or a Star Formation

### Supplies:

- \* Black construction paper or plain paper
- \* Tape
- \* Pushpin, large needle, thin knitting needle, a wooden skewer, tooth pick
- \* Thick towel
- \* A star template (See below)

### Procedure:

- \* Place the template on top of the black paper and use tape to secure in place.
- \* Place the paper on the towel or work on a carpet.
- \* Use the pushpin to poke a hole through the small dots on the template and the black paper. Use the larger or smaller points to make the different-sized stars.
- \* Remove the template and hang the back paper on a window so light can shine through your "stars".

Also see the *Keep a Night Sky Journal*

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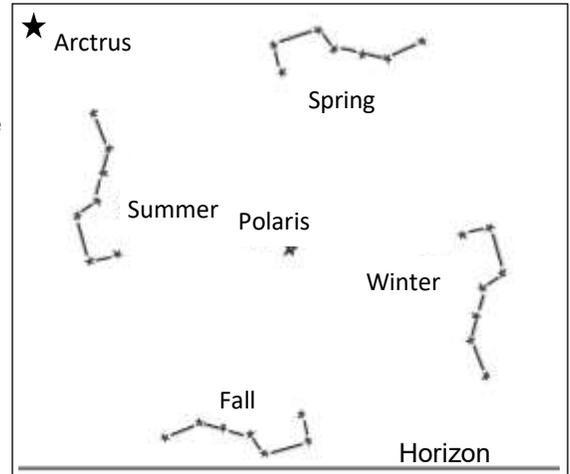
# The Big Dipper

The Big dipper is the best known and easiest star combination (asterism) to find in the night sky. It is not one of the 88 constellations but is part of the constellation Ursa Major or the Great Bear. To find the Big Dipper face north and, starting at the horizon, (where the sky meets the earth) scan up the sky. Look for bright stars in the pattern below. Remember it is part of the Great Bear so it will be big. In the spring the Dipper is high in the sky and upside down (pouring out the spring rains). In the fall it is low and right side up (scooping up the harvest).

The two stars forming the side of the Big Dipper's bowl always point directly toward Polaris, the North Star, the only star that does not move in our sky. Polaris is the end of the Little Dipper's handle or the tip Ursa Minor's tail - the Little Bear. The stars of the Little Dipper are not as bright and light pollution may make it harder to see.

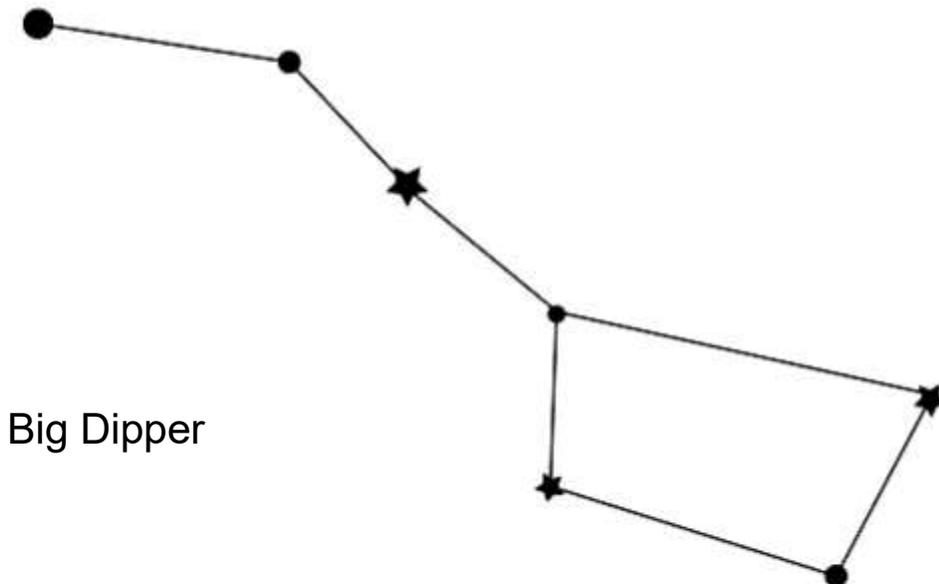
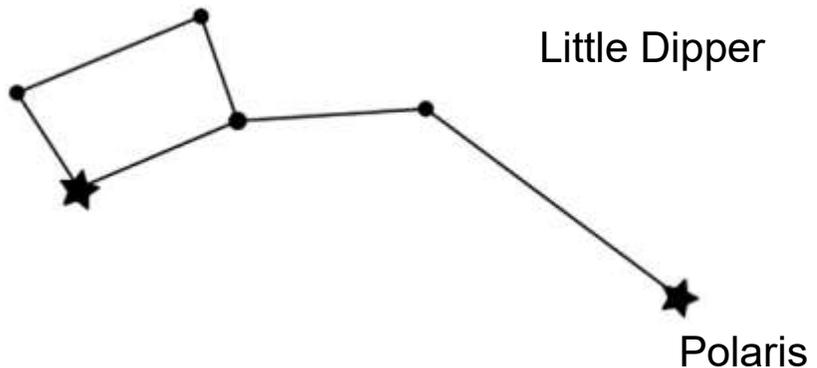
Follow the curved line made by the Dipper's handle until you reach a large reddish star named Arcturus - follow the "arc" to Arcturus.

Now you have already found 4 objects in the sky!



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## Star Template for Big Dipper and Little Dipper



# Sagittarius and the Teapot

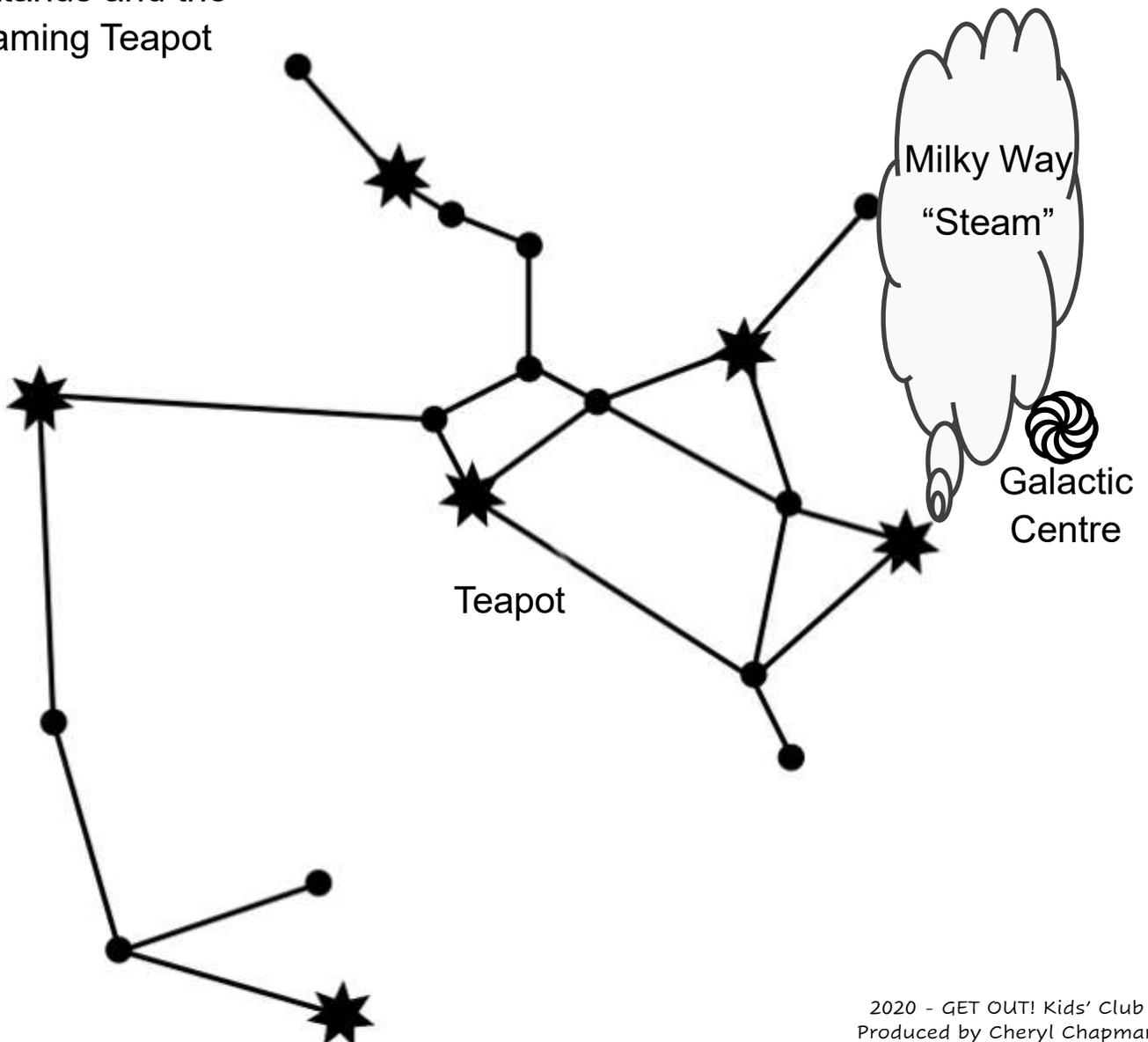
Sagittarius, the Archer, is one of the 88 constellations, and one of the 12 constellations of the zodiac. Summer is the best time to see Sagittarius but it does sit low in the sky. Find a place where you have clear view of the southern horizon. Begin at the horizon and pan upward looking for the “steaming teapot”. The Teapot is an asterism - a recognized star formation but not considered a constellation. The Teapot is part of the Sagittarius constellation.

The Sagittarius constellation contains some of the most popular deep-sky objects in the night sky. For example, it contains a pair of nebulae, the Lagoon and Trifid Nebulae and many bright Messier objects. The Teapot’s spout points toward the Galactic Centre - the centre of our galaxy! Sagittarius and the Teapot are a great place to start your search for all the Messier objects.

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## Star Template for Sagittarius and the Steaming Teapot



# Orion the Hunter and his Dog

The bright stars of Orion the Hunter and Canis Major make these two winter constellations easy to spot with just your eyes. They are visible in our sky from November to February. Just after sunset face south and a bit to the east. Start at the horizon and scan upward while looking for three bright stars neatly lined up.

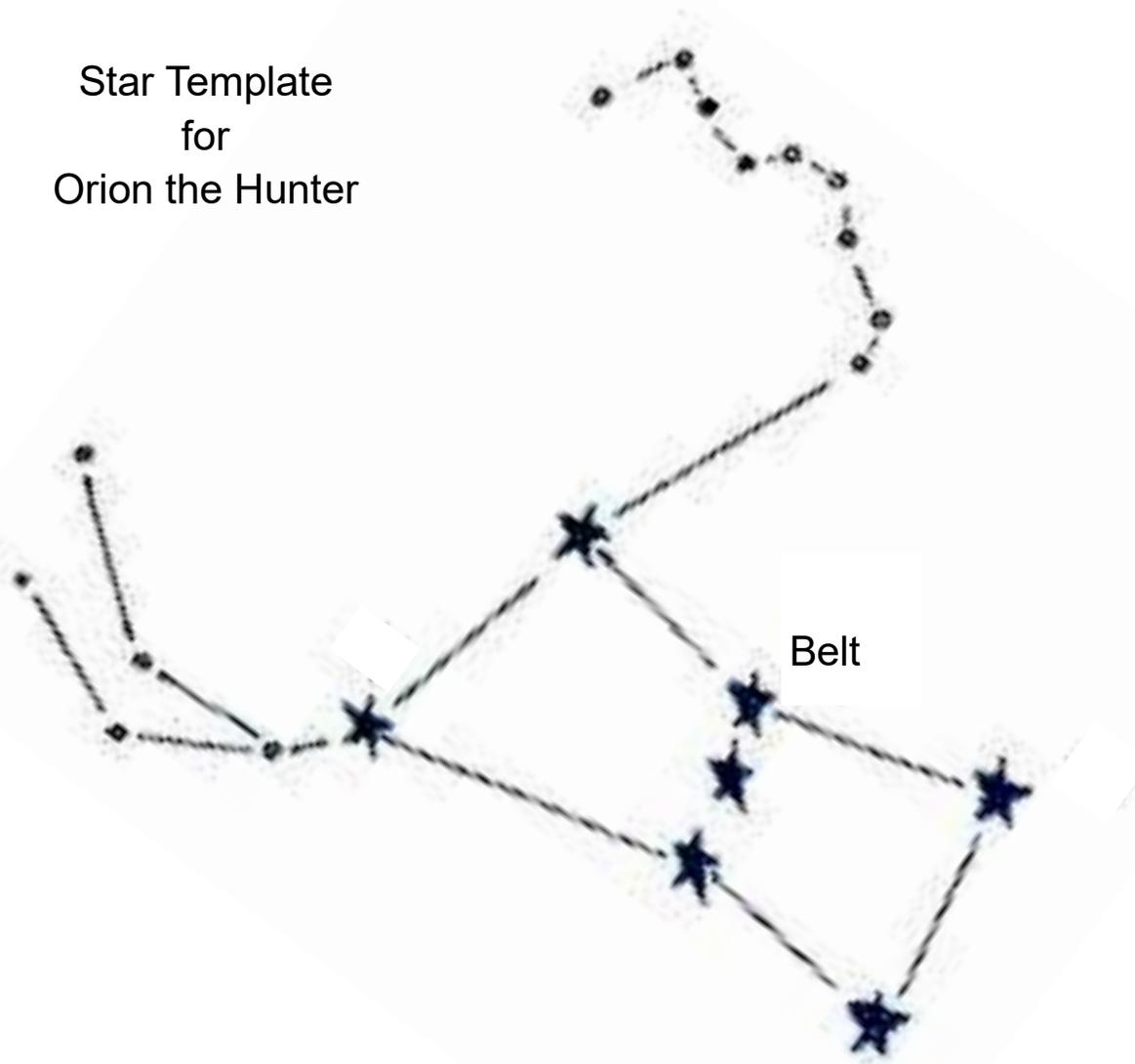
Once you've located the three bright stars of Orion's belt, practice locating his two "shoulder" stars (above the belt) and the two stars that form the hem of the Hunter's cloak (below the belt, toward the horizon)

To find his dog, Canis Major, draw an imaginary line from the left of the belt and slightly down (toward the horizon) and you will see one of the brightest stars in the night sky. Sirius forms the head of Orion's faithful dog.

Time for some hot chocolate!

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## Star Template for Orion the Hunter



**Sirius**

in Canis Major



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