



Family Unit Study: *Stars and Constellations*

SARAH NOFTLE & NICOLE WELDON

TEACHER AND READING SPECIALIST



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Design and Layout by Mallory Foster: www.malloryfoster.com

Visit the author's website at: www.HowWeeLearn.com



FAMILY UNIT STUDY: STARS AND CONSTELLATIONS

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FAMILY UNIT STUDIES

Welcome Home!

Thank you so much for choosing a How Wee Learn Family Unit Study. This unit study has been created with care by me, a homeschooling Mom and former teacher. These unit studies have worked so beautifully with my own family I knew they must be shared. My time in the classroom, certification as a Reading Specialist, and 18 years as a mom has given me a unique perspective on what children truly 'need to know'.

What is a Unit Study?

A unit study focuses on critical thinking and problem solving, allowing children to dive deep into fascinating topics and engage in meaningful learning.

When a child is engaged in what he or she is learning, that learning sticks. And when a child is engaged and *fascinated* in what he or she is learning, learning is amazingly fun for the whole family! Say goodbye to those power struggles.

Each unit study is broken down into ten topics with manageable, bite-sized amounts of incredible information. Each of these ten topics include a hands on activity, a math or literacy enrichment question, a YouTube video, book suggestion, interesting fact and discussion question.

What are the components of a Unit Study?

HANDS ON ACTIVITY

Each of the ten topic includes a hands on activity that brings the information shared and discussed to life! This allows children to really engage in and solidify their learning. The hands on activities use items you likely have already. If you do not have an item, think creatively about what you do have on hand and adapt. No buttons? I bet beads could work. No pipecleaners? Maybe you have some yarn!

MATH ENRICHMENT WORD PROBLEM

Each unit study includes five math word problems covering the five math strands: Number Sense, Geometry, Measurement, Patterning and Data Management/Probability. The word problem introduces your child to each of these areas with the belief of quality over quantity. This is not a full

math curriculum of course, but an enrichment opportunity and chance to be exposed to some real world math.

As you go through a question, consider how you might change it slightly to ask a follow up question. Perhaps you could ask, "What would happen if there were 6 birds instead of 5?" Or you might get out some manipulatives and help your child dive into deeper learning about the geometry topic introduced.

LITERACY ENRICHMENT ACTIVITY

When a child is learning about a fascinating topic, there are so many natural opportunities to tie in literacy development. Reading, researching, recording information, labeling, and note taking will all happen very naturally.

On top of this, each unit study includes five literacy enrichment activities modified to three levels so they are fitting for the whole family. Creating poems, public speaking, practicing letter formation, and literacy scavenger hunts are all fun ways literacy learning is brought to life with these unit studies.

CURATED YOUTUBE VIDEO

Each of the ten topics includes a carefully curated YouTube video. Dive into some fun and easy learning with experts in the field, entertaining stories, and inspiring tales, all selected to highlight key learning concepts. Enjoy some time snuggled on the couch learning with popcorn and a movie!

BOOK SUGGESTION

The book suggestions for each topic are just that—suggestions. Any books at all on the unit study theme are strongly encouraged. Immersing our



children in a literacy rich environment and offering plenty of time to dive into research, pictures, and stories is key for child-led learning.

INTERESTING FACT

Did you know that elephants suck their trunks much like babies suck their thumbs? Or that a human has the same number of neck bones as a giraffe? Interesting facts are a wonderful way to spark a child's interest and imagination, which is why every topic includes an interesting fact.

DISCUSSION QUESTION

Asking the right questions and having meaningful discussions is a wonderful way to meet your child at his or her current level of understanding and to help your child grow his or her learning and thinking about topics. So much can be learned through one meaningful discussion!

How do I use a Unit Study?

These unit studies are completely flexible and can be used however you wish. For those who would like a few suggestions, I will outline two possible ways you might choose to use these unit studies.

OPTION 1: FOCUSED UNIT STUDY

Your family might choose to focus on one unit study over a two day period.

Day 1	<ul style="list-style-type: none"> Introduce the topic with the curated YouTube video Have an amazing discussion using the discussion question as a prompt Research more about the topic with the suggested book or a book of your choice Read the interesting fact together
Day 2	<ul style="list-style-type: none"> Dive into the hands on activity for some deep learning Complete the math or literacy enrichment question
Day 3+	<ul style="list-style-type: none"> Core skill work in reading, writing and math at your child's individual level Go on a family outing Extracurricular activities Start another topic!

OPTION 2: BLENDED UNIT STUDY

Alternatively, your family might choose to blend the unit study with your core skill learning over a three day period.

Day 1	<p>Morning:</p> <ul style="list-style-type: none"> Core skill work in reading, writing and math at your child's individual level <p>Afternoon:</p> <ul style="list-style-type: none"> Introduce the topic with the curated YouTube video Have an amazing discussion using the discussion question as a prompt
Day 2	<p>Morning:</p> <ul style="list-style-type: none"> Core skill work in reading, writing and math at your child's individual level <p>Afternoon:</p> <ul style="list-style-type: none"> Research more about the topic with the suggested book or a book of your choice Read the interesting fact together Complete the math or literacy enrichment question
Day 3	<p>Morning:</p> <ul style="list-style-type: none"> Core skill work in reading, writing and math at your child's individual level <p>Afternoon:</p> <ul style="list-style-type: none"> Dive into the hands on activity for some deep learning
Day 4+	<ul style="list-style-type: none"> Core skill work in reading, writing and math at your child's individual level Family outings Extracurricular activities Start another topic!

There is no right or wrong way to dive into this unit study. When learning is this exciting, you simply cannot go wrong!

I hope you and your family love this unit study! If you have any questions at all, wish to purchase more unit studies, or if I can be of assistance, please visit www.howweelearn.com/family-homeschooling-unit-studies or email me at sarah@howweelearn.com.

xo
Sarah



TOPIC 1

What is a Star?

When we look up at the night sky on a clear, cloud free evening, we will see hundreds of twinkling stars above us. But what is a star? A star is a burning ball of gas—more specifically, hydrogen and helium—that produces light and heat. Let's explore...

Spark Curiosity



Did you know? The second-closest star to us is Proxima Centauri. It is over four light-years away, which means the light we see from it is over 4 years old.



I wonder if humans will ever visit other stars?

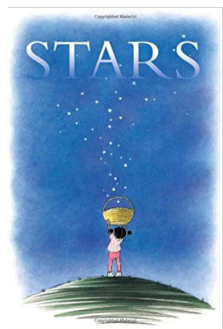
Resource Suggestions



What Are Stars?

SciShow Kids

Find out what makes stars what they are, and take a tour of some of the most extreme stars in space!



Stars

Mary Lyn Ray

From acclaimed author Mary Lyn Ray and two-time Caldecott Honor winner Marla Frazee comes this tender, evocative—and profound—exploration of stars both near and far.

HANDS ON ACTIVITY

- “Paint Splatter the Night Sky” on page 7

Math Enrichment Word Problem

Have blocks, stones, or other manipulatives available for these math problems. Be flexible and change up the numbers to make these problems the right challenge for your children. Extend on the problems and ask follow up questions if your child is enjoying these challenges!

- ★ Almost all of the stars we see in the sky have planets orbiting them. If we look at 2 stars and each of those stars has 2 planets orbiting it, how many planets will there be in total?
- ★★ Almost all of the stars we see in the sky have planets orbiting them. If we look at 5 stars and each of those stars has 3 planets orbiting it, how many planets will there be in total?
- ★★★ Almost all of the stars we see in the sky have planets orbiting them. If we look at 16 stars and each of those stars has 5 planets orbiting it, how many planets will there be in total?



HANDS ON ACTIVITY

Paint Splatter the Night Sky

Types of Learning: Creativity, Art, Vocabulary Building, Storytelling, Fine Motor Skills, Gross Motor Skills

WHAT'S HAPPENING?

As we splatter paint, drops of paint fall to the paper in various sizes and depth of colour. Some drops are big, some are small, some are deep in colour, and some are light in colour. This is very much like the stars we see in the night sky.

Stars come in all shapes, sizes and even colours! Did you know that stars range in colour? Stars can be blue, white, yellow, orange or red! The colour of a star is affected by its temperature and age.

Cooler stars are red, warmer are orange, and the hottest are blue. If you look at a campfire, you might notice that the very center of the fire is a blue/white colour—this is where the fire is hottest. Near the edge of the fire, the flames are orange/red and the fire is slightly cooler (but still very hot!).

While most stars look white from Earth, Betelgeuse, a star in the constellation Orion, actually looks a bit red when we see it.

Adapted from Love the Night Sky.

[Check it out here for more interesting facts about stars.](#)

Materials

- Construction paper
- Yellow paint
- Paintbrushes
- Sidewalk chalk and water (optional)

Directions

1. Grab a few pieces of construction paper and take some yellow paint outside.
2. Using paintbrushes, splatter paint the night sky! You can also use sidewalk chalk, grate it up, add some water, and make your own liquid sidewalk chalk, if you prefer.
3. Can you find anything that looks like a constellation you know? Can you find anything that looks like it would make a good constellation? What is it? What would be the story attached to it?





TOPIC 2

Life Cycle of a Star

Like all living things, stars have a life cycle. An average star goes through four life stages: a star, a red giant, a planetary nebula, and finally, a white dwarf. A massive star goes through a slightly different life cycle, but for this unit study, we will be focusing on an average star. Let's explore...

Spark Curiosity



Did you know? Stars are formed inside a nebula (a huge cloud of gas and dust in space). This type of nebula is often referred to as a "star nursery."



I wonder, do stars ever change color or size?

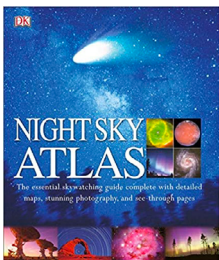
Resource Suggestions



Stars 101

National Geographic

Countless stars dot the night sky. Learn how these celestial objects form, how they are classified by brightness and temperature, and what happens when they die.



Night Sky Atlas: The Universe Mapped, Explored, and Revealed

DK

Take an out-of-this-world journey - incredible see-through pages launch you from our solar system into the depths of space.

HANDS ON ACTIVITY

- "Salt Dough Stars" on page 9
- "Life Cycle of a Star" on page 26

Literacy Enrichment Activity

- ☆ Write your name letters then trace the letters in yellow marker with dots.
- ☆☆ Write your first and last name, then trace the letters in yellow marker with dots.
- ☆☆ Write a new word you have learned this unit, perhaps Cassiopeia or hydrogen, then trace the letters in yellow marker with dots.



HANDS ON ACTIVITY

Salt Dough Stars

Types of Learning: Bringing Meaning to Abstract Facts and Ideas, Strengthening Hands, Making Things to Scale, Learning About Colour

WHAT'S HAPPENING?

When you look at the Life Cycle of a Star printable, you can see what average stars look like as they go through their four life stages. So what is happening at each stage?

Star formation begins inside clouds of gas and dust, known as nebulae. The star has a nuclear reaction in the center of its core, which gives it energy to glow and shine brightly for a very, very, very long time. Small stars live the longest and can live for billions of years.

The nuclear reaction within the core of a star is fueled mostly by hydrogen. This hydrogen eventually begins to run out and the star enters its next phase of life.

In the red giant phase, stars cool down and expand. After this phase, the star returns to planetary nebulae and then a small white dwarf. It stays as a small white dwarf until it entirely runs out of hydrogen fuel.

Once it cools down entirely, it stops glowing and is sometimes referred to as a 'black dwarf'.

Adapted from National Schools' Observatory.

[Check it out here for more interesting facts about stars and astronomy.](#)

Materials

- Salt dough
- Paint
- Paintbrushes
- Sharp pencil and string (optional)

Directions



"Life Cycle of a Star" on page 26

1. Roll some balls of salt dough, cook them, then paint them to match the different life stages.
2. You can poke a hole through the middle so they can be hung in a window as well.
3. Try making: an average yellow star, a red giant, a blue massive star, and a red super-giant using the Life Cycle of a Star printable as a reference.

Salt Dough Recipe

1. Stir together **1 cup salt**, **1 cup water** and **2 cups flour** in a bowl. Continue stirring until it starts to ball up.
2. Remove dough from bowl and knead with your hands.
3. Shape and press the dough into the desired shape, approximately 1/4-inch thick.
4. Bake on a baking sheet lined with parchment paper at 300°F for about 3 hours (it will feel hard and may start to turn brown).
5. Remove from oven and allow to cool completely.
6. Paint or decorate your salt dough as desired.



TOPIC 3

The Sun

The sun is the most important source of energy for life on Earth. It is a yellow dwarf star and is a ball of gas in the center of our solar system. The sun's gravity holds our solar system together, keeping all of the planets in orbit. Let's explore...

Spark Curiosity



Did you know? The closest star to us is the sun! It takes 8.2 minutes for the light from the sun to reach us on the Earth's surface.



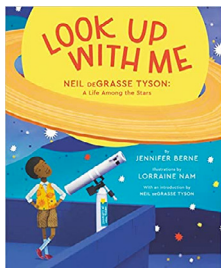
Why do the stars move across the sky at night? Do they move during the day when we can't see them?

Resource Suggestions



**Bill Nye the Science Guy
S1E19 Outer Space**
esther patterson

Let the famous Bill Nye the Science Guy get you and your children about stars in this 20 minute video.



Look Up with Me
Jennifer Berne

Follow young Neil's journey as he discovers the wonders of space, the thrill of science, and the joy in sharing the beauty of our amazing universe.

HANDS ON ACTIVITY

- "Papier Mache Sun" on page 11

Math Enrichment Word Problem

Have blocks, stones, or other manipulatives available for these math problems. Be flexible and change up the numbers to make these problems the right challenge for your children. Extend on the problems and ask follow up questions if your child is enjoying these challenges!

- ★ If we went outside and counted 10 stars and wanted to group them into pairs of 2, how many pairs of stars would we have?
- ★★ If we went outside and counted 50 stars and wanted to put them into groups of 5, how many groups of stars would we have?
- ★★★ If we went outside and counted 32 stars and wanted to put them into groups of 3, how many groups of stars would we have? Would we have any left over?



HANDS ON ACTIVITY

Papier Mache Sun

Types of Learning: Sensory Learning, Following Instructions, Art, Creativity

WHAT'S HAPPENING?

The sun is such an important part of our solar system it deserves an entire art project dedicated to it!

While the sun is an average star, it is the most important thing for life on Earth! Our Earth is kept in orbit by the gravity of the sun, and the sun gives us the light we need for warmth and growing things to eat.

The sun is humongous. If we take the weight of our entire solar system—all of the planets and the sun—the sun makes up about 99.8% of that mass. The sun is also about 110 times wider than Earth.

Since we are so far away from the sun, light that leaves the sun takes about 8 minutes to reach us on Earth. While this might seem like a very long time, the light from the second closest star to us is 4.3 light years away, which means it takes 4.3 years for the light from that star to reach Earth!

It is estimated that the sun is currently 4.6 billion years old, and it is believed that the sun will live for another 10 billion years!

I wonder what Earth will look like then?

Adapted from Science Kids.

[Check it out here for more interesting facts about the sun.](#)

Materials

- Balloon
- Newspaper
- Flour
- Water
- Paint
- Paintbrushes
- String

Directions

It is easy for us to forget that our sun is, in fact, a star! Our sun is simply the closest star to us. Let's have some fun and make a papier mache sun.

1. Blow up a balloon and tie it.
2. In a bowl, mix one part flour to two parts water to make your glue.
3. Rip up strips of newspaper, dip them into your glue mixture and stick them onto the blown up balloon.
4. Repeat until the balloon is covered in many layers of newspaper.
5. Once dry, paint your papier mache balloon to resemble the sun and hang it over your kitchen table!





TOPIC 4

Polaris

Polaris is also known as the North Star or Pole Star. It is located right above the North Pole, which makes it appear to always be in the same place in the sky. This is the reason that Polaris has been used for centuries to help sailors and travellers find their way. Polaris is over 4 times bigger than the sun! Let's explore...

Spark Curiosity



Did you know? You can see about 2,000 stars from any place on Earth, on a clear dark night with your naked eye.



Why does the northern sky have different stars and constellations than the southern sky?

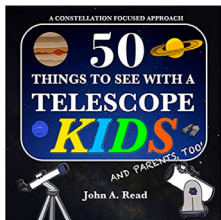
Resource Suggestions



What are stars and constellations?

Mizyaka Dizyaka ENG

An introduction to stars and their varieties, and constellations, for slightly older children.



50 Things To See With A Telescope - Kids: A Constellation Focused Approach

John A. Read

Every page features a helpful "telescope view", showing exactly how objects appear through a small telescope or binoculars.

HANDS ON ACTIVITY

- "Flashlight Constellations" on page 13
- "The Big Dipper and The Little Dipper" on page 28

Literacy Enrichment Activity



"Star Cut Outs" on page 27



Have your child cut out some stars. Write your child's name letters on the stars, one letter per star. Hide the stars all around the house for your child to find and put in order!



Have your child cut out some stars and write her name letters on the stars, one letter per star. Hide the stars all around the house for your child to find and put in order!



Have your child cut out some stars and write a new word she has learned this unit on the stars, one letter per star. Hide the stars all around the house for your child to find and put in order!



HANDS ON ACTIVITY

Flashlight Constellations

Types of Learning: Following Instructions, Problem Solving, Fine Motor Skills, Learning About Nature, Real Life Skills

WHAT'S HAPPENING?

Polaris is a bright star and always appears to be in the same place in the sky—right above the North Pole—so it is a very helpful star for travellers to know how to locate. Polaris is located at the very end of the handle of the Little Dipper. It is easiest to locate by finding the Big Dipper and drawing an imaginary straight line from the two bright stars at the front of dipper all the way to the Little Dipper's handle.

Materials

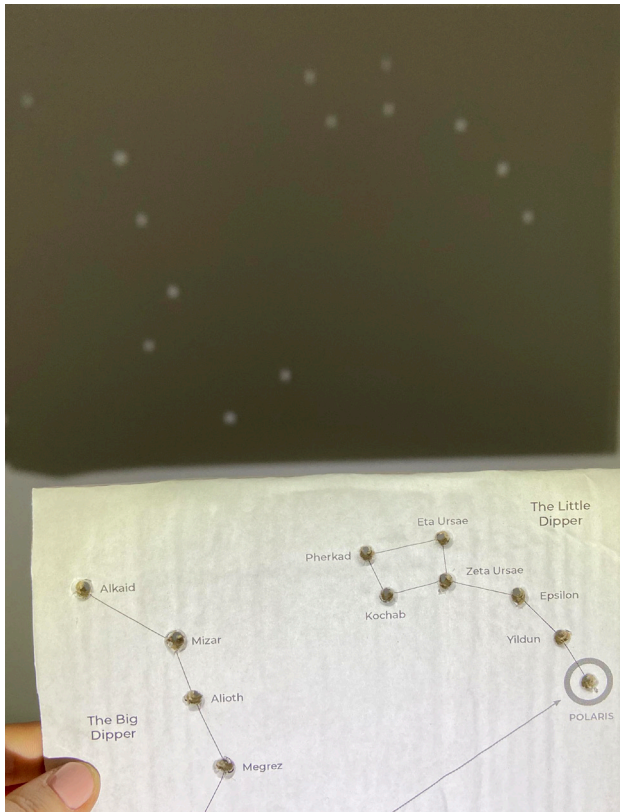
- Cardboard
- Sharp pencil or nail
- Glue
- Flashlight

Directions



"The Big Dipper and The Little Dipper" on page 28

1. Glue The Big Dipper and The Little Dipper printable to a piece of cardboard.
2. Poke holes through all of the stars with a sharp pencil or a nail.
3. Head into a dark room, shine a light through your cardboard, and watch your stars appear on the wall!
4. Practice finding Polaris using your cutout, then head outside when it gets dark and try to find the real Polaris.





TOPIC 5

What is a Constellation?

When you look up at the night sky, you might notice that some stars seem to group together, forming pictures. Long ago, our ancestors noticed this too and named many of these star groupings after mythological figures. Let's explore...

Spark Curiosity



Did you know? There are 88 internationally-recognized constellations visible around the world. 36 are visible predominantly in the northern sky and 52 are visible predominantly in the southern sky.



What pictures do you see in the stars? What would you name your constellations?

Resource Suggestions



Constellations: Connect the Dots in the Sky!

SciShow Kids

For a long time, people have seen pictures among the stars, just like connect the dots! Learn all about constellations, including some of the easiest ones to spot, and what some people thought they looked like.



Zoo in the Sky

Jacqueline Mitton

Take an illuminating ride through the starry night sky with National Geographic's Zoo in the Sky!

HANDS ON ACTIVITY

- "Constellation Search and Find" on page 15

Literacy Enrichment Activity



"Simplified Constellation Myths" on page 29

- ★ Have your child retell a constellation myth in her own words and you write it down. You can write the myth with a few blanks where your child can write the words herself. Your child can also draw a picture to accompany her words.
- ☆☆ Have your child retell the constellation myth and you write it down. Using your writing as a model, have your child write down her myth. You can also do this as a fill in the blank activity to meet your child's needs.
- ☆☆ Have your child write her own summary of her favourite constellation myth, or multiple constellation myths to create a constellation book.



HANDS ON ACTIVITY

Constellation Search and Find

Types of Learning: Fine Motor Skills, Critical Thinking, Problem Solving, Spatial Awareness, Mapping Skills

WHAT'S HAPPENING?

The 88 constellations we see in the sky today got their origins from long, long ago. Some of the constellations take a whole lot of imagination and practice to see!

Ptolemy was an ancient Greek astronomer who listed 48 of these 88 constellations. The remaining 40 are relatively new constellations.

It is interesting to think that some of the stars within one constellation may not be close to each other at all. Some are very far from one another, set way, way back in the universe, but when we look at these stars from Earth, they seem to be grouped together. The stars that are closer to us tend to look brighter.

Adapted from Ducksters.

[Check it out here for more interesting facts about constellations.](#)

Materials

- Construction paper
- Paper (a dark colour works best)
- Pencil
- White chalk

Directions

As you create the constellation search and find, choose a few constellations where you can easily see the picture (such as Orion) and a few that require a lot more imagination (such as Cassiopeia).

1. On a piece of construction paper, draw some constellations. Do this using white chalk and drawing just the dots (stars), not the lines.
2. Make a legend at the bottom of the page or on a second sheet of paper so you can keep track of the constellations you draw.
3. Fill the page with more chalk dots.
4. Now, try to find the constellations!
5. Try trading your constellation sheet with your grown up or a sibling and try to find each other's constellations.





TOPIC 6

Cassiopeia

The constellation Cassiopeia was named after Queen Cassiopeia. She was placed in the sky along with her daughter (Andromeda) and husband (Cepheus) because she often bragged that her daughter was more beautiful than the sea nymphs. Let's explore...

Spark Curiosity

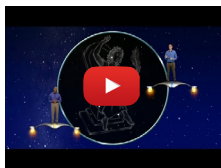


Did you know? Different cultures have drawn different pictures (constellations) in the stars and told stories about them throughout history.



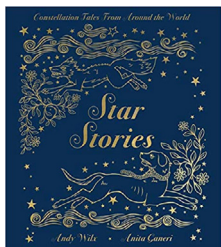
If you didn't know what stars were, what would they make you think of? What might you guess they could be?

Resource Suggestions



Star Gazers - "Cassiopeia: Queen Of The Northern Sky"
South Florida PBS

Star Gazers 5 Minute #1446 Nov 17-23, 2014 "Cassiopeia: Queen Of The Northern Sky"



Star Stories
Anita Ganeri

Share the wonder of the stars with this delightful storybook collection featuring constellation myths from around the world.

HANDS ON ACTIVITY

- "Constellation Myths" on page 17
- "Cassiopeia Constellation" on page 30

Math Enrichment Word Problem

Have blocks, stones, or other manipulatives available for these math problems. Be flexible and change up the numbers to make these problems the right challenge for your children. Extend on the problems and ask follow up questions if your child is enjoying these challenges!

- ★ How many letters are in the word "constellation"? Have this word written out for your child to count.
- ★★ We know there are 88 constellations. If you have learned about 12 constellations, how many more do you need to learn about in order to know them all?
- ★★★ We know there are 88 constellations. How many different ways could these constellations be grouped in 2? For example, 1 and 87, 2 and 86, etc.



HANDS ON ACTIVITY

Constellation Myths

Types of Learning: Art, Creativity, Literacy Skills, Fine Motor Skills, Storytelling

WHAT'S HAPPENING?

Cassiopeia is one of the 48 constellations named by the Greek astronomer Ptolemy. It is nicknamed the “W constellation” since the constellation is formed by five bright stars that make the shape of a W.

Within the constellation Cassiopeia is “Gamma Cassiopeiae”. This is the star located right in the middle of the W shape and the brightest star in the constellation. It is a blue star that is 610 light years away. It is 40,000 times brighter than our sun!

Constellations are grouped into families by their location in the sky, the time they were named, or the myth with which they are associated. Cassiopeia is in the Perseus family of constellations which includes other constellations having to do with the myth of Perseus. Three additional constellations were categorized as belonging to this family because of their position in the sky.

Adapted from Constellation Guide.

[Check it out here for more interesting facts about Cassiopeia.](#)

Materials

- Markers or crayons
- Paper

Directions



“Cassiopeia Constellation” on page 30

The Cassiopeia constellation is a very simple one involving only five stars in the shape of a crown, but the myth associated with it is quite elaborate!

1. Print the Cassiopeia Constellation printable and examine it's shape closely. What story could you make up to go with this shape?
2. Draw your own constellation animal or figure around these five stars and tell your own story. Grown ups can help younger children write out their myth.
3. You can turn this activity into a poster, adding details about your myth and beautiful colours.





TOPIC 7

Orion

Orion is one of the most easily recognizable constellations because of the three bright stars in a row that form the hunter's belt. The myth of Orion is varied, depending on the legend you read. One version says that Orion was boasting about his skills as a hunter, so a great God punished him for boasting by sending a scorpion which killed him and put him in the sky forever. Let's explore...

Spark Curiosity



Did you know? All stars are made up of mostly hydrogen and helium. (You are partly made of hydrogen, too!)



How do planets stay in orbit around their stars?

Resource Suggestions



Myth of Orion: Constellation Quest

Free School

Have you ever seen the constellation Orion in the night sky? Find out how to identify it, when to see it, the myth of Orion the Hunter, and a little bit about the great Orion Nebula in this child-friendly introduction to one of the most striking constellations in the heavens.



What We See in the Stars

Kelsey Oseid

A richly illustrated guide to the myths, histories, and science of the celestial bodies of our solar system, with stories and information about constellations, planets, comets, the northern lights, and more.

HANDS ON ACTIVITY

- "Marshmallow and Pretzel Constellations" on page 19

Math Enrichment Word Problem

Have blocks, stones, or other manipulatives available for these math problems. Be flexible and change up the numbers to make these problems the right challenge for your children. Extend on the problems and ask follow up questions if your child is enjoying these challenges!

- ☆ The constellation Orion has 19 stars. You have 17 stones to create the constellation Orion. Do you have enough? How many more do you need?
- ☆☆ Of the 19 stars in Orion, 10 have planets orbiting them. How many do not have planets orbiting them?
- ☆☆☆ If you wanted to make the constellation Orion using stones, you would need 19 stones. How many stones would you need if you wanted to make it two times? What about three times?



HANDS ON ACTIVITY

Marshmallow and Pretzel Constellations

Types of Learning: Counting, One-to-One Correspondence, Fine Motor Skills, Visual Spatial Skills, Learning to Follow a Pattern

WHAT'S HAPPENING?

The constellation associated with Orion the hunter is a very fascinating grouping of stars. It contains both Betelgeuse and the Orion Nebula.

Betelgeuse is located on the right shoulder of Orion and is the second brightest star in the constellation. This star is 642 light years from Earth, which means that light leaving that star reaches us 642 years later! It is a very interesting star because it is one of the only stars that appears red from Earth!

The Orion Nebula is the middle star in Orion's sword – but it is, in fact, not a star at all. While it appears to look like a star from Earth, it is actually a formation of dust, hydrogen, helium, and other gases.

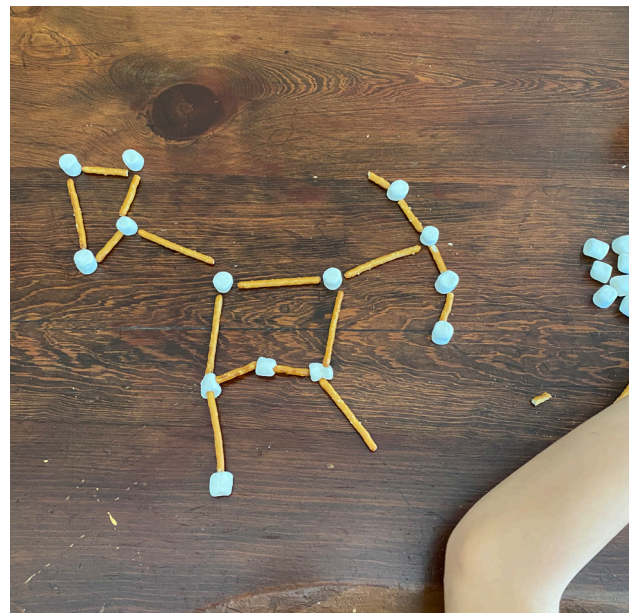
Orion is also one of the 48 original constellations named by Ptolemy.

Materials

- Mini marshmallows
- Pretzel sticks

Directions

1. Choose your favourite constellation and count out the number of stars that it has.
2. Gather enough mini marshmallows and pretzels to build your constellation!





TOPIC 8

Draco the Dragon

Draco represents Ladon, a hundred-headed dragon. He was guarding a golden apple tree for Hera, but was put to sleep by Hercules playing music. Hera punished him by sending him up to the stars, where he still sits today. Let's explore...

Spark Curiosity



Did you know? There are an estimated 1 trillion stars in the Milky Way galaxy.



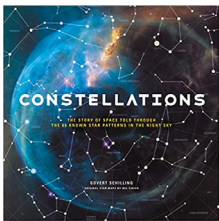
I wonder how many of the stars I see have planets around them?

Resource Suggestions



Super Stars (Constellations) Crash Course Kids

So, you know about stars. But what if those stars formed a super group like The Avengers? Well, then you have a Constellation!



Constellations Covert Schilling

Constellations is a beautifully illustrated, fascinating guide to all 88 constellations, including an illustrated star map for each.

HANDS ON ACTIVITY

- "Hammer and Nail Night Sky" on page 21

Literacy Enrichment Activity

- ☆ Write the word "star" for your child. Come up with as many words that rhyme with star as you can together. Have your child write one or more of the rhyming words under the word star. Point out how the ending stays the same and only the first sound changes.
- ☆☆ Write a rhyming sentence about Draco the Dragon. For example, "If I could fly to the stars in a wagon, I would go to see Draco the dragon!"
- ☆☆☆ Write a rhyming poem about Draco the Dragon using the information you already know and what you have recently learned.



HANDS ON ACTIVITY

Hammer and Nail Night Sky

Types of Learning: Hand Eye Coordination, Woodworking Skills, Creative Thinking, Vocabulary Building, Creative Writing

WHAT'S HAPPENING?

Yet another original constellation named by Ptolemy, Draco the Dragon is a fascinating constellation to look at in some detail.

Draco is one of the largest constellations in the night sky and belongs to the Ursa Major family of constellations. It is classified as a "circumpolar constellation" which means it never sets below the horizon when being looked at from the northern hemisphere.

Circumpolar constellation can be seen in the night sky throughout the whole year, not just seasonally like some other constellations. This is because circumpolar constellations are circling the north or south celestial poles.

Adapted from Constellation Guide.

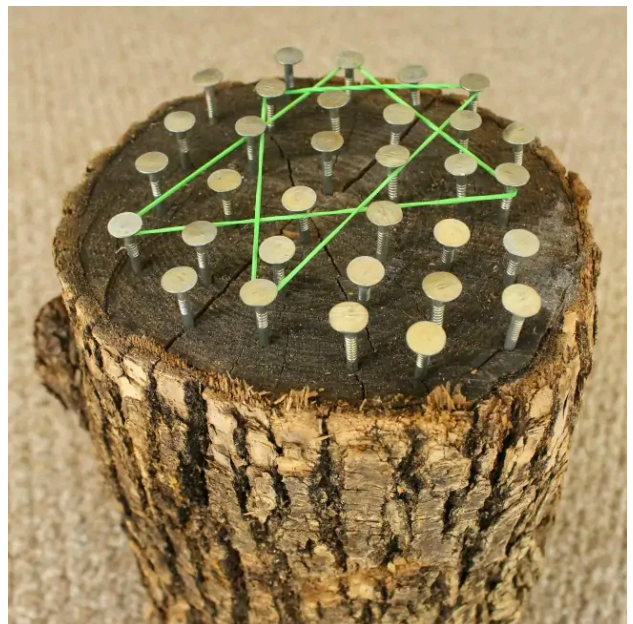
[Check it out here for more interesting facts about Draco the Dragon.](#)

Materials

- Hammer
- Scrap wood
- Nails
- Elastics

Directions

1. Hammer nails into a piece of scrap wood, with the nails representing the stars.
2. Once you're happy with how your 'night sky' looks, stretch elastics around the nails to pull out images that might work as constellations. Can you find one that looks like a snake? Or a bunny? Or maybe a King's crown?





TOPIC 9

Ursa Major

Zeus, King of the Gods, fell in love with Callisto and had a child names Arcas. This made Hera, Queen of Gods, upset. She turned Callisto into a bear. One day, Arcas went into the woods and found his Mother, the bear. She greeted him by going up on her back legs, but Arcas thought this meant he was under attack, so he readied his bow! When Zeus saw this, he turned Arcas into a little bear and put both Callisto and Arcas into the sky to keep them safe. Let's explore...

Spark Curiosity



Did you know? Astronomy is widely considered to be the oldest science.

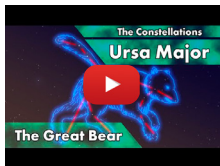


What makes the stars twinkle?

HANDS ON ACTIVITY

- "Salt Dough Constellations" on page 23
- "Constellation Shapes" on page 31

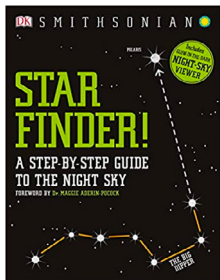
Resource Suggestions



The Constellations - Ursa Major

Delta Planetarium

This is the first video in our new series examining the constellations of the night sky in depth. To start this series off, the first episode is about Ursa Major and the Big Dipper.



Star Finder! A Step-by-Step Guide to the Night Sky

DK

Take this practical page-turner on your out-of-this-world adventure to experience cosmic wonders, key constellations, and intergalactic information.

Math Enrichment Word Problem

Have blocks, stones, or other manipulatives available for these math problems. Be flexible and change up the numbers to make these problems the right challenge for your children. Extend on the problems and ask follow up questions if your child is enjoying these challenges!

- ★ Let's pretend to look closely at the 7 stars in Ursa Major. If each of the 7 stars had 2 planets orbiting them, how many planets would there be in total?
- ☆☆ Let's pretend to look closely at the 7 stars in Ursa Major. If the first 5 stars had 1 planet orbiting each of them, and the other 2 stars had 2 planets orbiting each of them, how many planets would there be in total?
- ☆☆☆ Let's pretend to look closely at the 7 stars in Ursa Major. If the first star had one planet orbiting it and each following star had one more planet than the star before, how many planets would there be in total orbiting all 7 stars?



HANDS ON ACTIVITY

Salt Dough Constellations

Types of Learning: Sensory Experiences, Following Directions, Fine Motor Skills, Visual Spatial Skills, Hand Strengthening

WHAT'S HAPPENING?

Ursa Major was also named by Ptolemy. It includes the stars in the Big Dipper, which make the tail of Ursa Major. With Ptolemy naming so many of our constellations, perhaps we should learn a little more about who this person was!

Claudius Ptolemaeus (or 'Ptolemy' in English) was a Greek man who lived from about 85 to 165 AD. Like most people at the time, he believed everything revolved around Earth, known as a geocentric theory. Ptolemy researched and evolved systems to explain the motions of the Sun, Moon, and the five planets known at the time. He believed the planets and sun moved around Earth in this order: Mercury, Venus, Sun, Mars, Jupiter, Saturn, now known as the Ptolemaic System. Ptolemy's book, "Mathematical Syntaxis" explained this system and included a star catalog with 48 constellations, with the same names we still use today.

Adapted from Kiddle.

[Check it out here for more interesting facts about Ursa Major and Ptolemy.](#)

Materials

- Salt dough
- Straw
- Parchment paper
- Flashlight

Directions



"Constellation Shapes" on page 31

1. Make a batch of salt dough.
2. Cover the Constellation Shapes printable with parchment paper. You can also make your own constellation silhouettes.
3. Have your child press the salt dough to fill the constellation shape. Then use a straw to poke holes for the stars in the constellation.
4. Bake the salt dough, then shine a flashlight through to reveal the constellation shape and design!

Salt Dough Recipe

1. Stir together **1 cup salt**, **1 cup water** and **2 cups flour** in a bowl. Continue stirring until it starts to ball up.
2. Remove dough from bowl and knead with your hands.
3. Shape and press the dough into the desired shape, approximately 1/4-inch thick.
4. Bake on a baking sheet lined with parchment paper at 300°F for about 3 hours (it will feel hard and may start to turn brown).
5. Remove from oven and allow to cool completely.
6. Paint or decorate your salt dough as desired.





TOPIC 10

The Big Dipper

The Big Dipper is an asterism, which is a pattern of stars, not actually a constellation. It is part of the constellation Ursa Major and looks like a saddle on the bear's back. Two of the bright stars in the Big Dipper, Dubhe and Merak, are known as "pointer stars" as they point straight to Polaris (the North Star). Let's explore...

Spark Curiosity

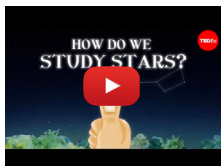


Did you know? Most of the stars you see in the sky are actually two stars. These are called binary stars and are two separate stars which orbit around each other.



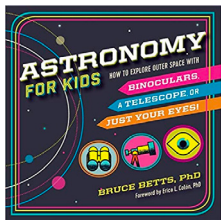
If stars are yellow, blue, and red, why do they usually look white from Earth?

Resource Suggestions



How do we study the stars?
TED-Ed

A beautifully animated TED-Ed presentation on the study of stars. Designed for older learners.



Astronomy for Kids: How to Explore Outer Space with Binoculars, a Telescope, or Just Your Eyes!
Dr. Bruce Betts

Ignite their passion for exploring the night sky—the astronomer's guidebook for kids ages 7 to 13.

HANDS ON ACTIVITY

- "Make a Star Clock" on page 25
- "Star Clock" on page 32

Literacy Enrichment Activity

- ☆ The Big Dipper has many names such as "The Wagon" and "The Plough". Look closely at the stars of the Big Dipper and brainstorm what else this asterism of stars looks like to you. Sound out these words and write them slowly. Grown ups can write this, depending on the child's ability level.
- ☆☆ The Big Dipper has many names such as "The Wagon" and "The Plough". Look closely at the stars of the Big Dipper and brainstorm what else this asterism looks like to you. Write down as many other names for the Big Dipper as you can!
- ☆☆☆ The Big Dipper has many names such as "The Wagon" and "The Plough". Look closely at the stars of the Big Dipper and brainstorm what else this asterism looks like to you. Come up with a new name for the Big Dipper and tell a myth that might be associated with your new name.



HANDS ON ACTIVITY

Make a Star Clock

Types of Learning: Following Instructions, Navigation, Cardinal Directions, Exploration, Nature Learning, Months of the Year, Counting

WHAT'S HAPPENING?

Our daytime concept of time is based on the motion and position of the Sun. But did you know that you can use the stars to tell time at night? It's easy using the Star Clock in this activity.

Long before the invention of clocks and watches, skywatchers knew that the motion of the stars marked the passage of time during the night. As Earth turns on its axis, the stars appear to rise in the east and set in the west, just as the Sun and Moon do. Looking up in the northern sky, however, the stars do not rise or set — instead, they seem to slowly turn counterclockwise around Polaris, the North Star.

Our Star Clock combines this nightly rotating motion around Polaris with the seasonal position of two familiar star patterns—the Big Dipper and Cassiopeia—to find the time in a simple and fun way.

Adapted from Sky & Telescope.

[Check it out here for more interesting facts about star clocks.](#)

Materials

- Cardboard
- Paper fastener or pin
- Glue

Directions



"Star Clock" on page 32

Now that you know so much about constellations and stars, it is TIME to make a star clock! Nowadays, we use clocks and watches to tell time, but long ago people used the sun to tell time during the day, and the constellations to tell time during the night.

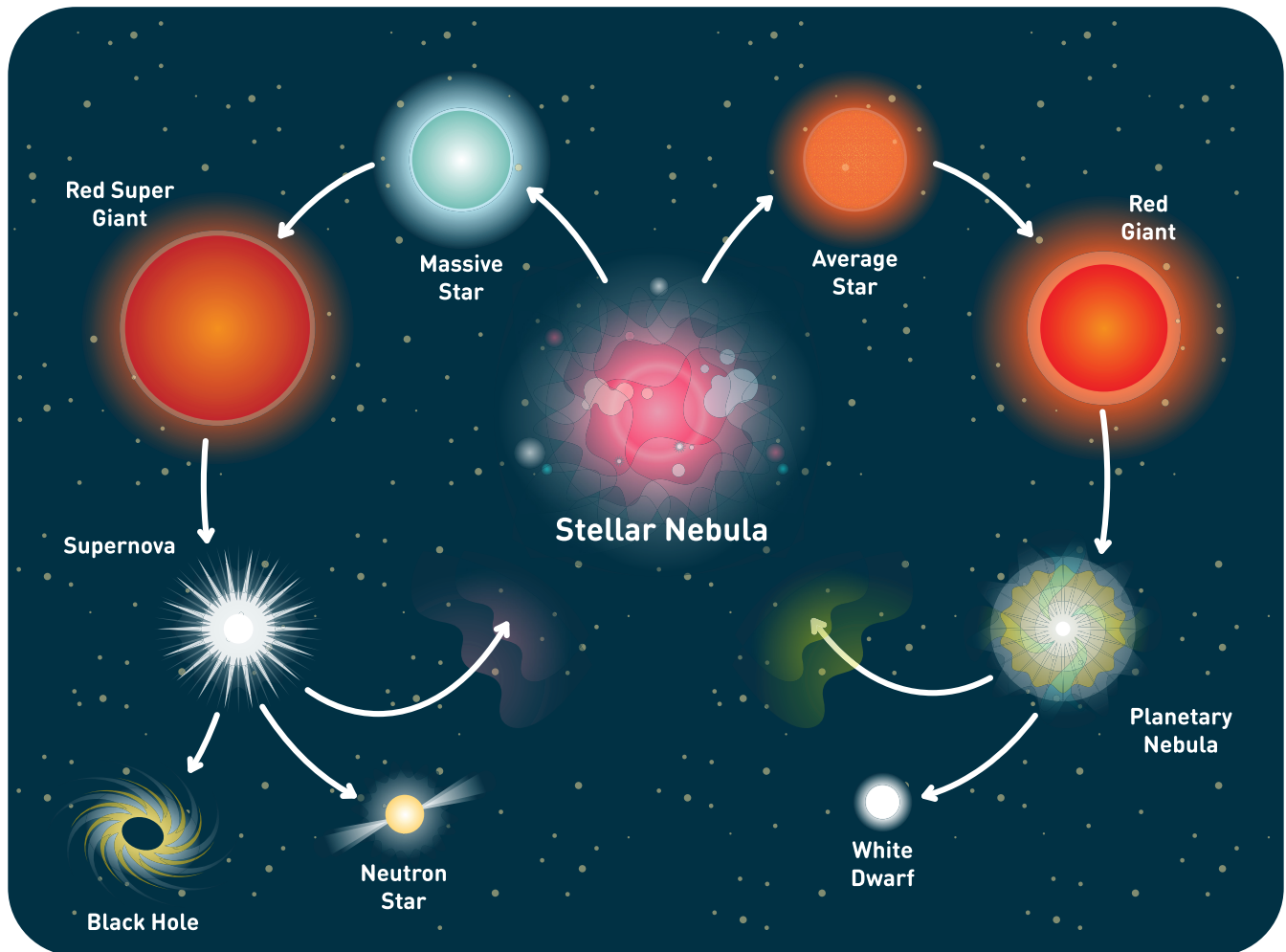
1. Print the Star Clock printable, cut it out, and glue the two pieces onto cardboard. Use a paper fastener to secure the two pieces together (or stick a pin through the center of the clock)
2. To use your star clock, head outside and find the Big Dipper. Use the Big Dipper to find the North Star and face it.
3. Turn the outer white circle of the star clock so the current month is at the top.
4. Now turn the inner black circle with the constellations until the Big Dipper lines up with the Big Dipper in the night sky.
5. What time appears in the window? If it is daylight savings time, add one hour.





TOPIC: LIFE CYCLE OF A STAR

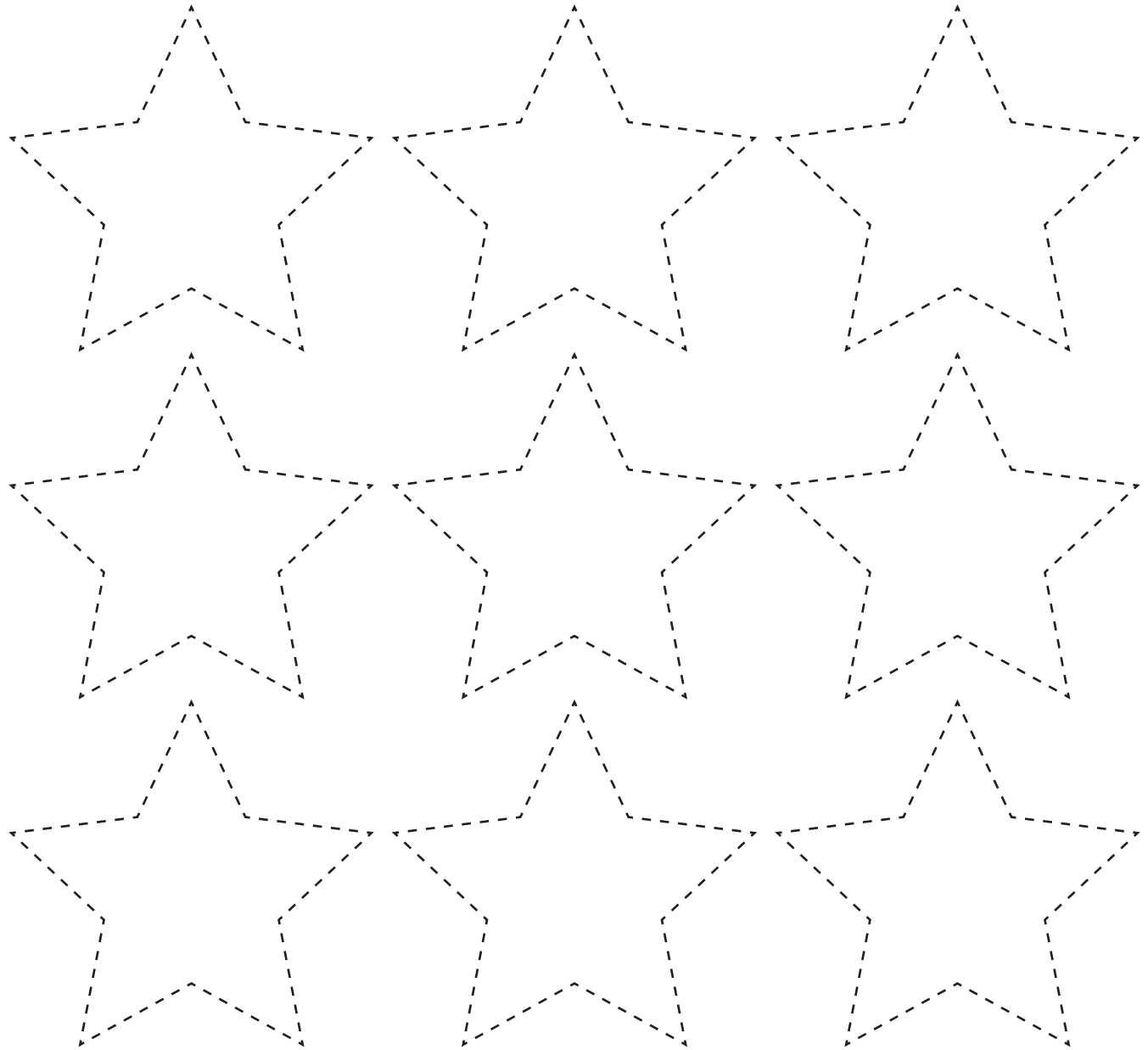
Life Cycle of a Star





TOPIC: POLARIS

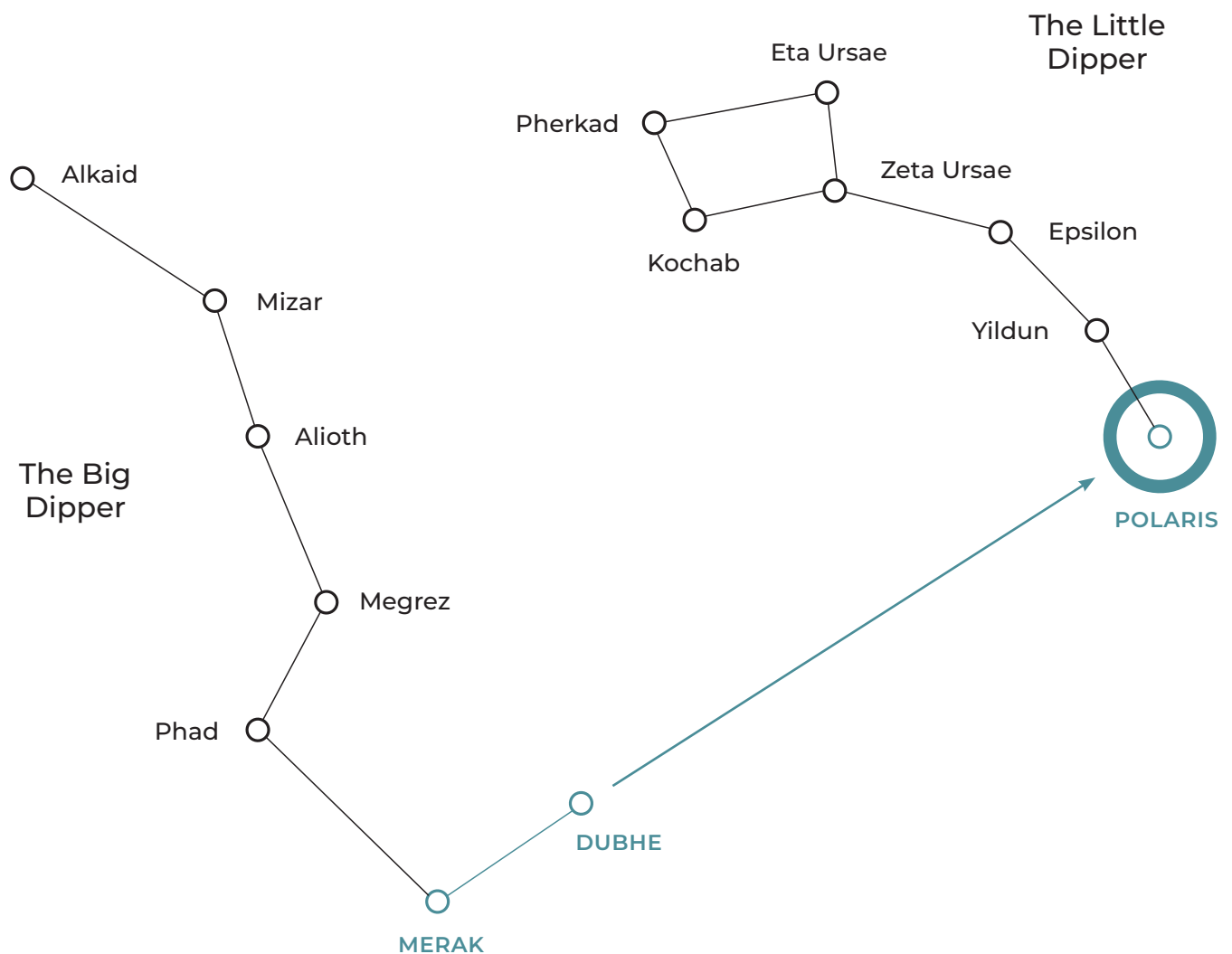
Star Cut Outs





TOPIC: POLARIS

The Big Dipper and The Little Dipper



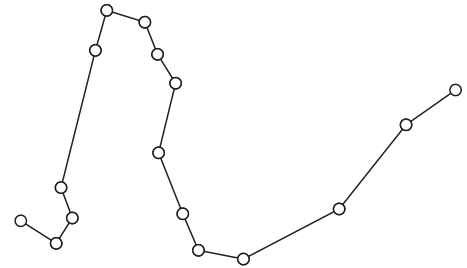


TOPIC: WHAT IS A CONSTELLATION?

Simplified Constellation Myths

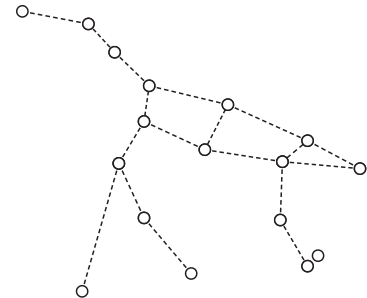
Draco the Dragon

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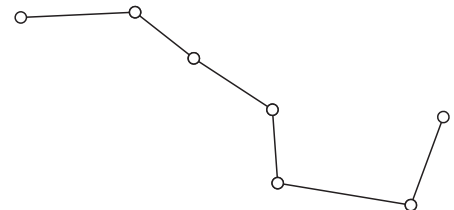
Ursa Major

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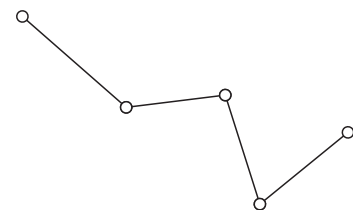
The Big Dipper

The Big Dipper is called an asterism, which is a pattern of stars—not actually a constellation. It is part of the constellation Ursa Major and looks like a saddle on the big bears back.



Cassiopeia

The constellation Cassiopeia was named after Queen Cassiopeia. She was placed in the sky along with her daughter (Andromeda) and husband (Cepheus) because she often bragged that her daughter was more beautiful than the sea nymphs.

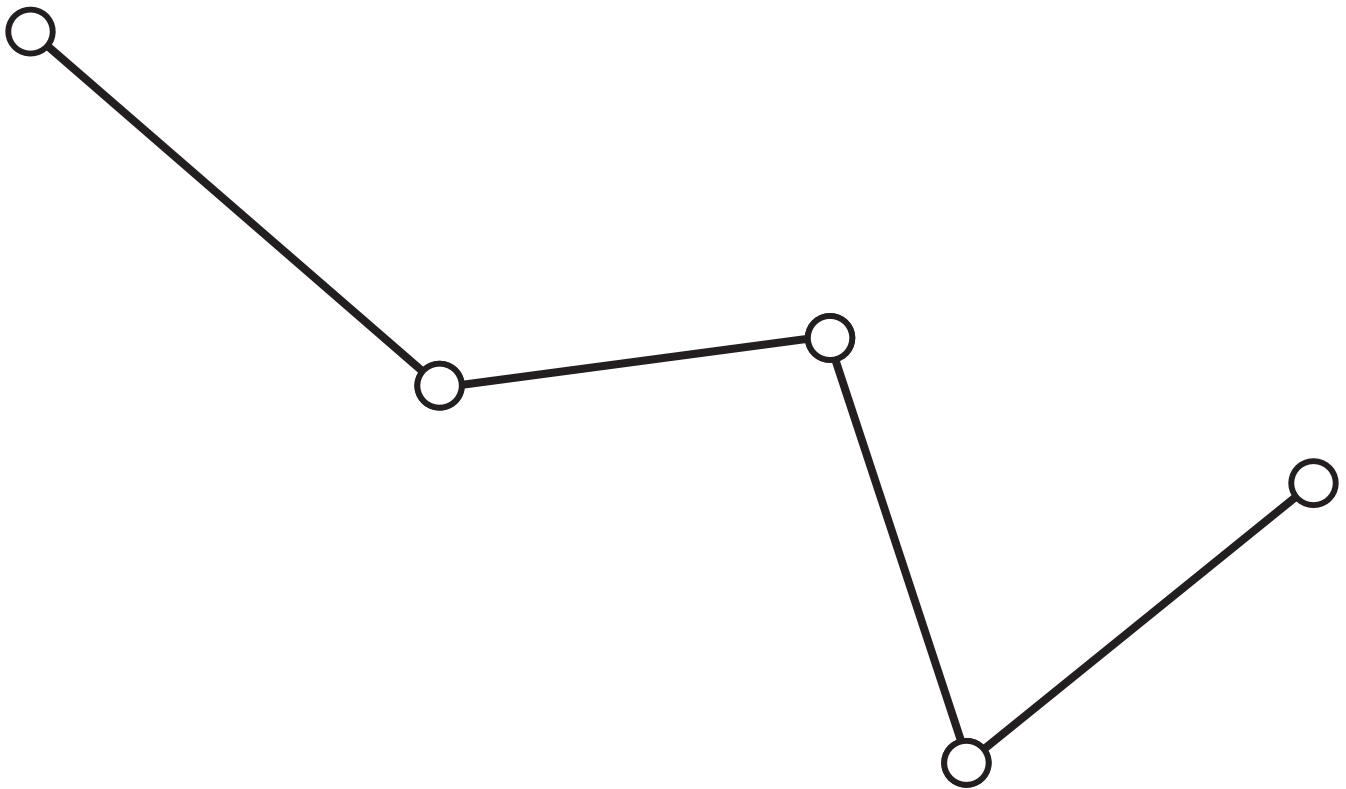




TOPIC: CASSIOPEIA

Cassiopeia Constellation

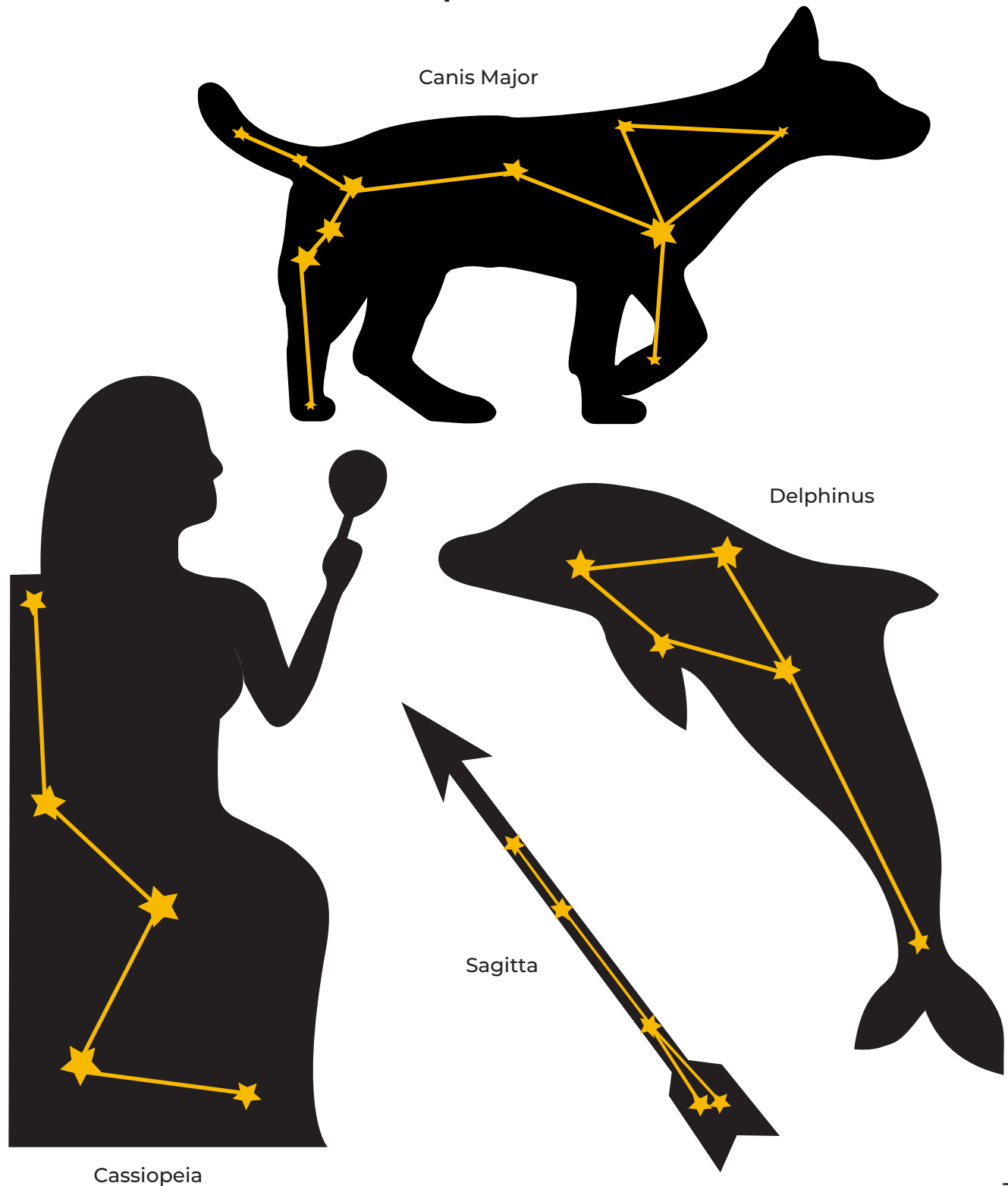
What story could you make up to go with this shape? Draw your own constellation animal or figure around these five stars and tell your own story. You can turn this activity into a poster, adding details about your myth and beautiful colours.





TOPIC: URSA MAJOR

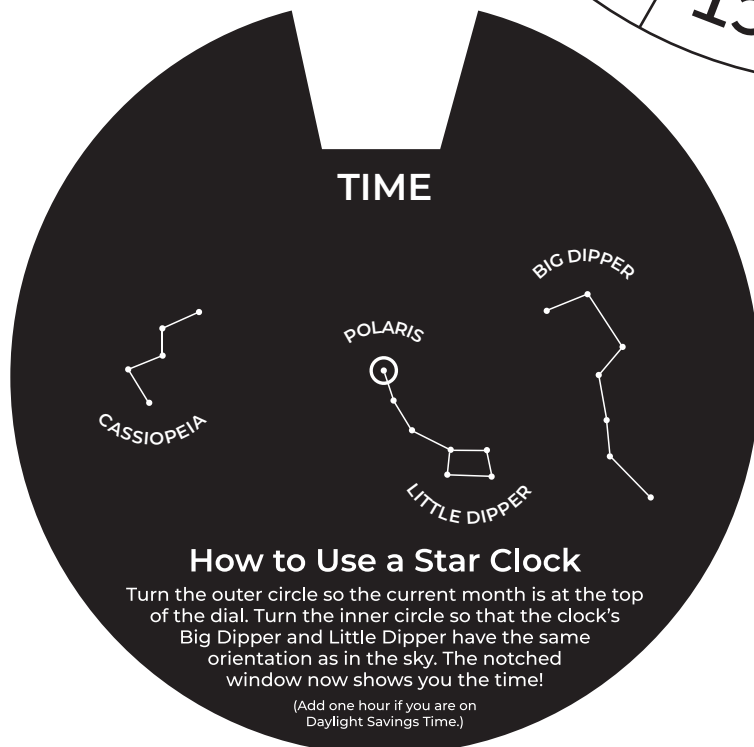
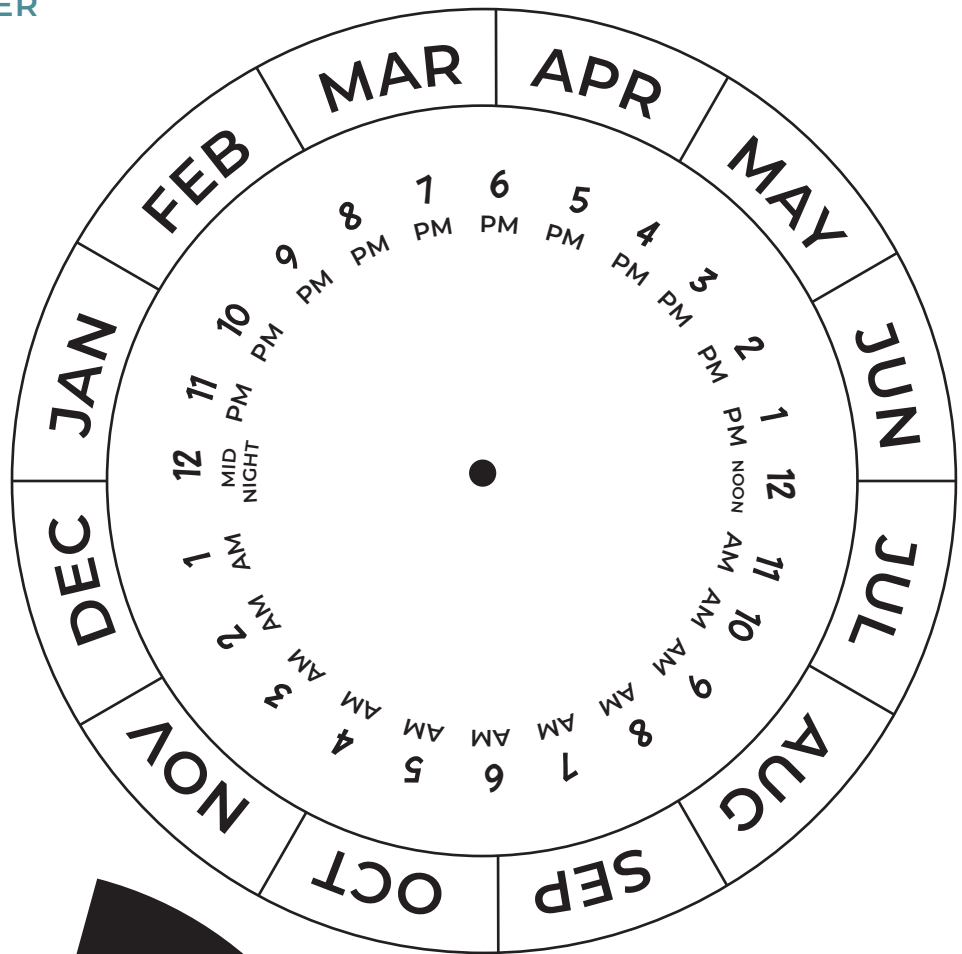
Constellation Shapes





TOPIC: THE BIG DIPPER

Star Clock





My Unit Study Notes on Stars and Constellations

TOPIC 1: WHAT IS A STAR?

TOPIC 2: LIFE CYCLE OF A STAR



My Unit Study Notes on Stars and Constellations

TOPIC 3: THE SUN

TOPIC 4: POLARIS



My Unit Study Notes on Stars and Constellations

TOPIC 5: WHAT IS A CONSTELLATION?

TOPIC 6: CASSIOPEIA



My Unit Study Notes on Stars and Constellations

TOPIC 7: ORION

TOPIC 8: DRACO THE DRAGON



My Unit Study Notes on Stars and Constellations

TOPIC 9: URSA MAJOR

TOPIC 10: THE BIG DIPPER