



# Stars and constellations

What are stars and constellations? Learn and explore in this activity.

## Utah Core Science Standards

2.2.2 Observe and record recognizable objects and patterns in the night sky.

2.2.2b Observe and describe the number, arrangement and color/brightness of stars in the night sky.

## Materials Needed

- Toothpicks
- Spaghetti
- Regular marshmallows
- Mini marshmallows

## Background

Our sun is a star. How is it different than other stars? Other stars are very, very, far away so they appear as small lights in the night sky. Stars are always shining in our sky, but we can only see them when our sun's bright light is not shining (at night).

Stars vary in size and temperature. Our sun is an average size star. When we look at stars at night their relative brightness depends on two things, how far away they are and what size they are. Brighter stars are either closer to Earth or quite large, or both.

A constellation is a grouping of stars. Constellations are useful for astronomers, both professional and amateur, to navigate their way around the sky. Constellations have allowed humans to chart the sky into visible patterns of stars for thousands of years. Most cultures have created fascinating constellation myths and stories.

We see constellations in 2-D, as if their pattern was on a sheet of flat paper. In fact, the distances between stars in constellations can be vast. Constellations are patterns that can only be seen from Earth. From other places in space they would no longer appear as a group.

Since the Earth rotates around its axis every 24 hours, the stars appear to move through the sky. Actually, we are moving.

Students will learn about these concepts and then create their own constellations, helping them to understand Earth and Space science.

Try to do this activity near a new moon, so children have a chance to view a dark sky for their homework.



## Directions

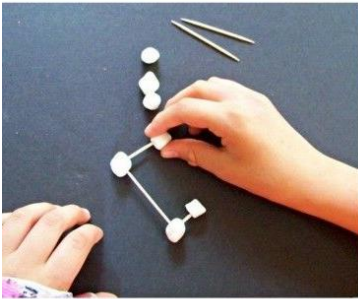
- Review with students what our sun is. A star! Why does it appear so bright? It is so much closer than any other star.
- Show students this video about stars. What are stars and constellations? Why questions for kids. Educational cartoon- <https://www.youtube.com/watch?v=adKrNga8-Qs>
- After watching the video review on the board some of the things you have learned.
  - You can make a chart like this:

Stars	Constellations
Are burning/ producing heat and light Are very far away Are different sizes- some very big! Are different temperatures	Are patterns of stars We see them as pictures, and we have stories about them All appear to move through the sky at night except Polaris/ the North Star

- Tell students they will be creating their own constellation. (If you like, do a pre-activity now, where students write a story about a constellation they create with their own imagination.)
- Distribute toothpicks, spaghetti and mini marshmallow to students. Give them 5-10 minutes to create their own constellation. You can ask students to be creative and create a new constellation or give them a pattern of a real constellation to create, such as the big dipper or Orion. If they finish early, they can make a story about their constellation and share it with a shoulder partner.
- Next remind students that stars are many different sizes and distances from Earth. Brighter stars in our night sky are either **larger** stars (very very big) or **closer** to Earth (perhaps millions of light years closer). You will be giving them large marshmallows to add in as bright or close stars.
- Before they add those in, challenge students to look at their constellation and answer this- Is their constellation flat? Could our model of a constellation be better? How? What is it missing to be an accurate representation of a constellation? Explain that constellations look flat to us, but they are composed of stars that are near and far to us. Within one constellation, some stars may be thousands of light years away from each other, but they look like they are in the same plane. Additionally, stars are different sizes. Some very large, some smaller.
- Challenge students to add **depth** to their constellation and thereby capture this concept in their model. They can transform their current 2-D constellation by poking toothpicks and spaghetti to build the constellation upwards. They are on the Earth viewing their constellation, and now they can see that some stars are closer and some are farther away, some stars are bigger and some are smaller.

- Once they are done, have them describe to a shoulder buddy which stars in their constellation appear brightest to us on Earth? Why? They should say that large marshmallows represent giant stars, and that is why they appear bright in the night sky. They should also describe how stars that are higher up are closer to us on Earth.

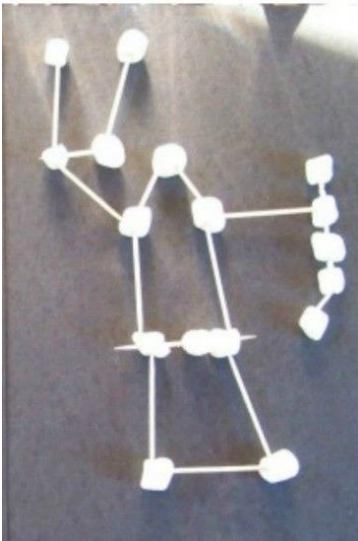
### Examples



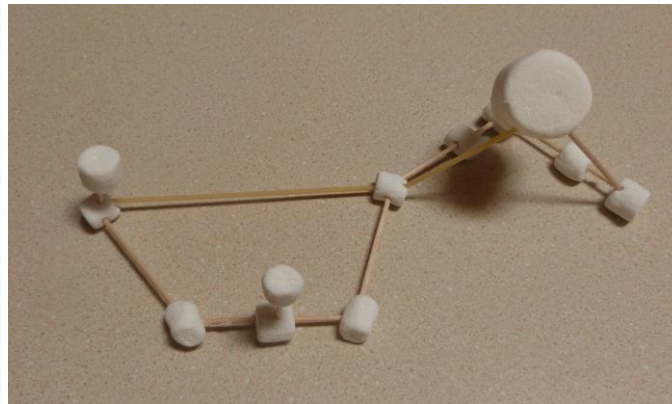
Initially your students will create a 2-D model. Students will do this without being told, it is the natural way to understand a constellation.

They can attempt to create a model of a known constellation or make up their own.

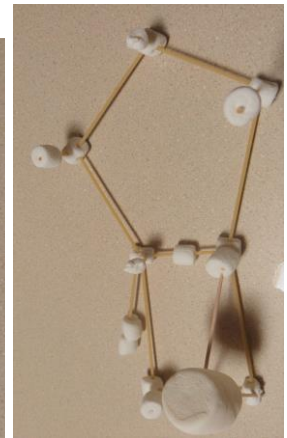
After asking students to add in large marshmallows and depth to make their constellation 3-D it will look more like this. Let them know it is ok to brace marshmallows with multiple toothpicks or spaghetti (break to the right size), creating support like the legs of a stool.



2-D constellations



3-D constellations



## Follow up Activity

Now that students have learned about stars and constellations, ask them to look for stars at home tonight. Remind students that they live in one of the darkest places in the United States. That can make it hard to view constellations because so many stars are visible. But it makes the stars so much more beautiful to gaze at. Can they find Orion? The Big Dipper?

Have students complete the homework on the back of the lab sheet. When they return to class the next day, ask if any students saw constellations move through the night sky?

Can they guess why the constellations appeared to move? The Earth rotates and celestial objects (the sun, moon and constellations) appear to move through the sky. Bring an image of a constellation up on your smartboard. Have the students stand and slowly rotate in a circle. They are the Earth. The constellation stayed in the same place but appeared to rotate from their view.