



# Junior Space Science Investigator

**Pillar:** STEAM

**Outcomes:** Develop a strong sense of self

**Juniors will earn their badge by understanding that the Earth orbits the Sun and how far away the Sun, Moon, planets, and stars are from our home planet, Earth.**

## 1. Model the Solar System

- a) Take a solar system walk. It's challenging to think about how big our solar system is. To do this, you will need a space about  $\frac{1}{2}$  mile long. Using the chart below, collect the objects you need for your walk. Glue or take them each to their own sheet of paper and label them according to the planet they represent. Set up the Sun and start there. Your giant steps should be about 3 feet apart. Use the chart to determine the number of steps you should take. Count out loud and place each planet on the ground as you walk the Solar System. What do you notice? What is surprising to you?

Object	Model & Size	# of Giant Steps to next planet	Total Steps = total yards from the sun	Approximate Miles from the Sun
Sun	8-inch ball	0	0	0
Mercury	Pinhead	10	10	36,000,000
Venus	Peppercorn	9	19	67,000,000
Earth	Peppercorn	7	26	93,000,000
Mars	Pinhead	14	40	142,000,000
Jupiter	Large Marble	95	135	484,000,000
Saturn	Marble	112	247	887,000,000
Uranus	Bead	249	496	1,783,000,000
Neptune	Bead	281	777	2,794,000,000
Pluto	Pinpoint or smaller	242	1,019	3,666,000,000

## 2. Circle the Sun. What is a year? How do we measure a year? The Earth orbits the Sun, and one orbit is equal to one year. How many times have you orbited the Sun?

- b) Find your age on other planets. Your age is the number of orbits you have taken around the Sun, but each planet is a different distance from the Sun, and they all orbit at different speeds. Go to <https://www.exploratorium.edu/ronh/age/> and discover how old you would be on other planets. How old are you on Mars? Jupiter? Did any of your discoveries surprise you?

### 3. Discover the stars

- c) Go on a night sky scavenger hunt. You can use your eyes or a smartphone app to help you identify the stars, constellations, or planets in the night sky. Keep in mind that not everything is visible in the sky on the same night or time of year. Just keep going outside on different nights to search the sky. Find:
- Orion
  - Leo
  - Scorpius
  - A planet – what color is it? What's its name?
  - Pegasus
  - Cygnus
  - Canis Major
  - The red giant – Aldebaran
  - Taurus
  - Ursa Major
  - the brightest star in the sky and the constellation it's in

### 4. Use tools to explore

- d) Use tools for finding your way. Make a paper star wheel - called a planisphere – and use it to find stars and constellations. Ask an adult to download the file and then print it on heavy paper. Our amazing community partner, Union Station and the Planetarium have a great resource for you:  
<https://www.instructables.com/id/Make-Your-Own-Planisphere/>

### 5. Share your sky. Scientists communicate with each other to discuss questions that interest them, share their research, and demonstrate their enthusiasm for space! Now it's your turn!

- e) Create a space show. This might be a song or rap, a skit, video, short story, or poem. Create something that will inspire and teach others about the wonders of space science and present it for your family or troop. Share it with your local council too!

#### Online additional resource:

Meet a Scientist: [Sara Seager](#)

Our wonderful community partner, The Arvin Gottlieb Planetarium, has live and recorded Facebook videos studying the sky, constellations, planets, and more <https://www.facebook.com/watch/KCplanetarium/>; check them out!

**When you're finished:** Congratulations, you have earned your badge! You can purchase by emailing [shopdept@gksmo.org](mailto:shopdept@gksmo.org) or at <https://www.girlscoutshop.com/Junior-Space-Science-Investigator-Badge>

No shipping charges apply at this time.

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