

Badge Blueprints

Space Science Badge

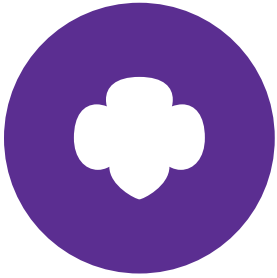
Junior-Ambassador | Grades 4-12

Earning badges is a great way for Girl Scouts to explore their interests and learn new skills. Badge Blueprints takes volunteers and Girl Scouts step-by-step through all the requirements to earn the badge. This resource covers badges for Girl Scout Juniors through Ambassadors.

Each month, the Emerson Resource Center will offer a new lineup of Badge Blueprints. For this month, check out these badges centered around Space Science! After completing all required steps, make sure to check out the Girl Scouts of Eastern Missouri Shop to purchase the grade-level specific Space Science Badge.

Note to Adult: This Badge Blueprint is intended for use by the Girl Scout adult leading the activity. The tone and information provided helps the adult speak to the Girl Scouts who are participating in this Badge Blueprint.





Space Science Investigator

Junior | Grades 4-5

Purpose: I will learn about the Sun, Moon, planets, and the Solar System, including how large they are and how far away they are from Earth.

Just how large is our Solar System? Can you see everything in the Solar System? Are there things in our Solar System that are beyond what your eyes can see? Learn about the planets, stars, and other objects found in space. Using salt dough, make a replica of the solar system to learn more about it's size and scope.

Step 1: Model the Solar System

The **Solar System** is made up of planets, moons, asteroids, comets, and dust that orbit around the Sun. Make salt dough and use it to create models of each of the eight planets and place them in order according to their distance from the Sun.

Use this recipe to make your salt dough: [BBC Good Food Salt Dough Recipe](#).

Step 2: Circling the Sun

The Earth moves around the Sun one time each year. This movement is called an **orbit**. Your age tells how many times you have orbited the Sun while living on Earth. Other planets orbit the sun at different speeds and distances. Because of this, your age would be different on other planets. Using the following website, discover how old you would be on planets such as Mars, Jupiter, and others.

[Girl Scout Space Science Activities](#).

Step 3: Discover the Stars

The **Moon** is the closest object to Earth in space, located about 240,000 miles away. Every month we can observe a full moon. Look at a calendar and note when the next full moon will take place. With an adult, plan a nighttime walk through your neighborhood or a local park. Using the light from the full moon, do a **nighttime scavenger hunt** and note which stars, constellations, and planets you see in the night sky. One recent United States space exploration mission was **Artemis II**, a mission connected to future exploration of the Moon.

Step 4: Explore Like an Astronomer

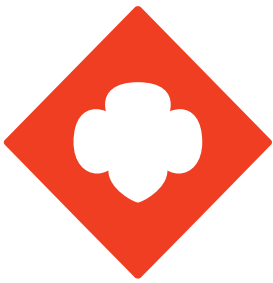
What kinds of tools do you think you would need to explore our Solar System? One tool astronomers use to help identify stars and constellations is a paper star wheel called a **planisphere**. With the help of an adult, make your own planisphere using this website: [Sky & Telescope Make a Star Wheel](#).

What is it like to be outside in the dark away from the lights of your neighborhood or city? Learn about a **star party** and plan to attend one.

Step 5: Attend a Night Sky Event

With the help of an adult, find a local **Night Sky Network** club or park where a **Night Sky Party** is being hosted. Attend the event and learn from astronomers and volunteers who study the night sky. Use this website to find an event near you: [NASA Night Sky Network Events](#).

Before attending, **create a list of questions** you would like to ask the astronomer hosting the event. Enjoy exploring the beauty of the night sky.



Space Science Researcher

Cadette | Grades 6-8

Purpose: I will learn about light, its amazing ability to help us see things we may not otherwise see, and how scientists use light to make discoveries about the universe and space.

Step 1: Create a Color Spectrum

Make a **color spectrum**, also known as a **Newton Disk**. Using the disk will help you see in real time how color is affected by light and motion.

Watch a video to see how the spinner works: [girlscouts.org/spacesciencecolorwheel](https://www.girlscouts.org/spacesciencecolorwheel).

Step 2: Learn About Different Types of Light

Learn about **light** and the different ways it can be seen. Using sunlight on a sunny day, make a **sun print** using **cyanotype paper**. Another option is to learn about **infrared light** and **infrared signals**. Identify examples of infrared light and infrared signals. Where might you find them in your home? What is each item, what is its purpose, and what does it look like? Can you find examples of where infrared technology is used in everyday life?

Step 3: Become an Astrophotographer

Plan an event where you are the **astrophotographer**. At this event, capture pictures of stars, planets, and the Moon using a digital camera or smartphone. Before starting, learn about taking pictures in low light, at night, or when objects are far away. Print copies of your pictures and add them to your notebook to share with others. When planning the event, be sure to coordinate with adults to make sure proper girl/adult ratios are met.

mo-www.cfa.harvard.edu/OWN/index.html.

Step 4: Learn About Light Pollution

Learn what **light pollution** is and how it impacts the ability to see objects in the night sky.

darksky.org/get-involved/measuring-light-pollution/.

Step 5: Share What You Learned

Share with your family or troop what light pollution is and discuss ways people can help reduce it.

Final Thought

If you would like to continue learning, create a **Researcher's Challenge** with your group. Identify a question about space or light that you would like to explore further and develop a plan to research and share your discoveries.

Companion Piece

Create a Research Notebook where you can record observations, ideas, sketches, and new learnings throughout your exploration of space science.

Check out the Girl Scout Shop where you can find a variety of notebooks and markers. Stop by the Service Center the next time you visit to see examples of materials that could be used while working on the Space Science Researcher activities.





Space Science Expert

Senior | Grades 9-10

Purpose: To learn more about where I fit in the universe and how light plays an important role in teaching us about the universe. To help track what you are doing and learning throughout this badge, carry a notebook to record ideas, thoughts, sketches, and new discoveries.

Step 1: Create a “Made of Stardust” Infographic

Scientists believe the elements that make up our bodies were created in stars long ago. Create a **picture** or **infographic** showing how you would look if you were made of **stardust**. First, identify the shape you would like to use. Draw an outline and select colors or patterns to represent the **four chemical elements** that make up the majority of the atoms in your body:

Hydrogen: 62%

Oxygen: 24%

Carbon: 12%

Nitrogen: 1.1%

Label each section of your body and color or decorate it using the patterns or colors you selected. Share your infographic with friends and family and explain how humans are connected to the stars.

Step 2: Organize a Nighttime Sky Scavenger Hunt

With friends or family, organize a **nighttime scavenger hunt**. You may use a telescope, binoculars, or simply your eyes to explore the night sky. Look for a local stargazing event where you can learn from an amateur astronomer. Before you go outside, make a list of the objects you hope to see and draw pictures or sketches of them in your notebook. Try to identify several of the following:

- The Moon
- A planet
- A star with an exoplanet (*be sure to learn what an exoplanet is*)
- A double star
- A nebula
- A star cluster
- A red star
- A blue star

After your observation session, record what you learned and compare what you expected to see with what you actually observed.

Step 3: Learn About Telescopes and How They Work

Telescopes allow scientists to see objects in space that are far beyond the reach of the human eye. Learn about the many different types of telescopes and what makes them powerful scientific tools. Plan an outing to a **Star Party** or **astronomy event**. While there, learn about different types of telescopes and how they are used. Before attending, research several of the following and come prepared to ask questions:

- Binoculars
- Small backyard telescope
- Common reflector or refractor telescope
- James Webb Space Telescope

As part of your research, find out:

- How telescopes gather light
- Why larger telescopes can see farther into space
- Why some telescopes are placed in orbit instead of on Earth

Step 4: Become a Citizen Scientist

Citizen scientists help researchers gather and interpret data that can lead to important discoveries. Visit **Girl Scouts NASA Citizen Science Projects** to learn about opportunities to participate in real scientific projects connected to space and astronomy. Choose one project or activity and record:

- What data is being collected
- How scientists use the information
- What you learned by participating

Step 5: Connect With the Astronomy Community

Find a place where you can continue learning and sharing your interest in astronomy and space science. Identify a local astronomy club, observatory, planetarium, science center, or online astronomy community. Learn how astronomers photograph images of astronomical objects through telescopes. Try photographing:

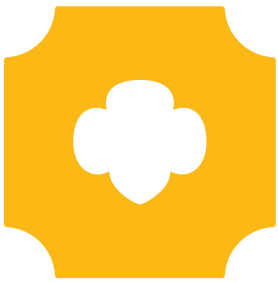
- The surface of the Moon
- Your favorite constellation
- A planet
- A long-exposure image of stars

Experiment with taking a **10-second exposure photograph** of the night sky. What changes do you notice compared to what you can see with your eyes alone? Record your observations and share your favorite image or discovery with others.

Closing Reflection

As you completed this badge, what surprised you most about the universe? How did studying light, stars, and telescopes change the way you think about your place in space and the larger universe?





Space Science Master

Ambassador | Grades 11-12

Purpose: I will deepen my understanding of the universe, space science, light, and NASA, and learn how discoveries in space science improve life on Earth and inspire future exploration.

Step 1: Plan a Journey Through Space

Choose a location in space, such as a **planet**, **moon**, **asteroid**, **exoplanet**, or **other celestial body**. Research your destination using the internet, books, library resources, or NASA materials as if you were planning a real trip there. Consider questions such as:

- What is this location like?
- Could life exist there?
- How long would it take to travel there?
- What special equipment would be needed?
- What would visitors see or experience?
- Where would travelers stay?

Create a **postcard**, **travel journey entry**, or **tourist brochure** highlighting your destination and encouraging others to visit.

Step 2: Explore Careers in Space Science

Learn about women and other professionals working in space related science careers since most of NASA careers are Earth based. Discover what inspired them to pursue careers in STEM and how they prepared for work on Earth and in space. Using **NASA's Space Science Mission Directorate**, explore careers, internships, competitions, webcasts, and virtual learning opportunities through: **[NASA Student Opportunities](#)**.

Host a **STEM Career Night** for younger Girl Scouts. Be sure to investigate these four areas of space science:

Heliophysics

Earth Science

Planetary Science

Astrophysics

Step 3: Become a Citizen Scientist

Citizen scientists help researchers collect and analyze information from around the world and beyond. Explore how you can contribute to real scientific research related to space science topics. Learn how to participate by visiting: **[NASA Citizen Scientists](#)** or **[Girl Scout Citizen Scientists](#)**. Design a proposal for a future mission, habitat, or technology that could help humans explore space safely.

Step 4: Experience Space Science in Your Community

Visit a local science center, planetarium, observatory, museum, or university program connected to astronomy or space science in the eastern Missouri region. Research locations that match your interests and plan a visit. Ask the local scientist to include information on how scientists use different wavelengths of light when viewing and studying stars, planets, and galaxies. Take photos, record observations, and consider inviting other Girl Scouts, friends, or family members to attend a special program or event you organize.

Step 5: Share What You've Learned About Women in STEM

Research **women working in STEM careers**, especially in astronomy, engineering, physics, or space exploration. Learn:

- What they do in their careers
- What inspired them to pursue STEM
- How their work benefits others
- What excites or inspires you most about their achievements

Share your discoveries through a presentation, video, display, social media post, or discussion with others.



How to Get Your Girl Scout Badge

When you finish the steps to earn a badge, it's time to celebrate your hard work by getting the badge for your uniform! There are two easy ways to get your badge:

1. Stop by the Girl Scout Shop

Visit the Girl Scout Shop at **2300 Ball Dr., St. Louis 63146**. You'll find badges, uniforms, fun Girl Scout gear, and more!

2. Shop Online

Go to girlscoutsem.org and click the **Shop** button at the top of the page. You'll see links to the Shop hours, location, and **email orders** (includes instructions for placing an online order through the GSEM Shop).

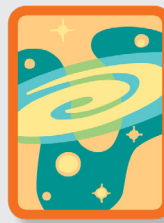
Tip for Leaders and Families: You can purchase badges individually, or leaders can place a troop order to celebrate all the Girl Scouts at once.



**Space Science
Investigator**



**Space Science
Researcher**



**Space Science
Expert**



**Space Science
Master**



Emerson Resource Center

The Emerson Resource Center (ERC), located in the Girl Scout Service Center, is dedicated to supporting volunteers and leaders, offering a variety of resources from outdoor equipment to program essentials and everything in between. The ERC is a lending library with items available to borrow such as books, kits, equipment for ceremonies, songs on CD, badge activity kits, and programs-in-a-box.

For more information on the ERC or assistance with resources, contact Kathy Dabrowski, Senior Manager, Archives and Special Collections, at 314.592.2324 or kdabrowski@girlscoutsem.org.

GSEM Shop and Build-A-Bear Workshop®

Make sure to stop by the Girl Scouts of Eastern Missouri Shop to get all the essentials, explore the latest in uniforms and apparel, and everything else Girl Scouts needs to express themselves!

And, located within the Shop, the new Build-A-Bear Workshop® is now open—providing a hands-on opportunity for the community to build plush companions while fostering creativity, confidence, and joy!

Book Your Party Today!

Celebrate birthdays, team milestones, or any special occasion with us. Our expert staff will guide your group step-by-step through the bear-making process and ensure every guest leaves with smiles (and a new cuddly companion!).

Shop & Play

Not hosting a party? No problem! The store is open for walk-in customers to purchase bears and accessories. Stop by anytime to bring a new furry friend home.

To learn more or reserve your party, visit girlscoutsem.org/buildabear.

Shop and Build-A-Bear Workshop® Hours

Monday-Wednesday: 10 am-5 pm

Thursday-Saturday: 10 am-7 pm

Sunday: noon-5 pm

**Hours subject to change*

Shop Location

2300 Ball Drive
St. Louis, MO 63146



girl scouts 
of eastern missouri

2300 Ball Drive | girlscoutsem.org | 314.592.2300

