

NISE Net Online Workshop

Empowering Girls in Science Through Growth Mindset and the New Girl Scout Space Science Badges

Tuesday, October 8, 2019



Welcome!

Today's presenters are:

- **Brad Herring**, Museum of Life and Science, NC
- **Pamela Harman**, SETI Institute
- **Theresa Summer**, Astronomical Society of the Pacific
- **Suzanne Harper**, Girl Scouts of the USA
- **Wendy Chin**, Girl Scouts of the USA

As we wait to get started with today's discussion, please:

Introduce yourself! Type your name, institution, and location into the Chat Box

Questions? Feel free to type your questions into the Chat Box at any time throughout the webinar or use the raise your hand function in the participants list and we'll unmute your microphone.

Today's discussion will be recorded and shared on nisenet.org at: nisenet.org/events/online-workshop



Online Workshop Overview



- Explore Science: Earth & Space 2020 Toolkit Application
- Growth Mindset in Girls
- Girl Scouts of the USA STEM Program and the New Space Science Badges
- Upcoming Professional Development Opportunities
- Q/A

Explore Science: Earth & Space Toolkit





Explore Science: Earth & Space 2020 toolkit

One application due November 1, 2019



**Part A –
350 shipping
January 2020**



**Part B –
350 shipping
August 2020
*includes immersive
Moon game**

Toolkit Eligibility



The physical toolkit is designed for informal science education public events and outreach. To be eligible to receive a physical toolkit, organizations must be:

- Located in the United States
- Public informal science outreach and education institutions such as:
 - science museums and science centers,
 - children's museums,
 - natural history museums,
 - public planetariums and observatories, and
 - NASA visitor centers

Please note that K-12 schools, afterschool programs, libraries, parks, and astronomy clubs are not eligible to receive physical toolkits. Consider downloading a digital toolkit if your organization does not meet eligibility criteria. Digital toolkits will be available for download in February 2020 at nisenet.org/earthspacekit

Application Process



Application link

Applications must be submitted online using SurveyGizmo by November 1, 2019.

- <http://www.nisenet.org/earthspacekit-apply>

Selection process

A total of 350 toolkits will be awarded through a competitive award process.

Partner Expectations



- **TOOLKIT PART A: Spring 2020 event**
 - Hold a **public engagement event** using Part A of the toolkit. Public events can be stand-alone events OR toolkit activities can be incorporated into an existing STEM public engagement event **during March - May 2020.**
- **TOOLKIT PART B: Fall 2020 public engagement**
 - **Engage the public** using Part B of the toolkit including the immersive Moon game. Public engagement offerings can be stand-alone OR you can incorporate into existing regular STEM programming on-site or off-site **during September 2020 - January 2021.**

Partner Expectations



Additional suggestions (*not required but encouraged*)

- Attending professional development online workshops for informal science educators
- Collaborating with local experts
- Collaborating locally to reach underserved audiences
 - <http://www.nisenet.org/collaboration-guide>
- Complete the NISE Net Annual Partner Survey

Using Your Toolkit All Year Long



Celestial events: Meteor showers, lunar eclipses, full moons, planetary events, and more

Earth and space science events:

- World Water Day, March 22, 2020
- Earth Hour, March 28, 2020
- Global Astronomy Month, April
- Yuri's Night, April 12, 2020
- Earth Day, April 22, 2020
- National Environmental Education Week, week of Earth Day
- Astronomy Day (Spring), May 2, 2020
- Astronomy Week (Spring), April 27-May 3, 2020
- World Oceans Day, June 8, 2020
- Asteroid Day, June 30, 2020
- International Observe the Moon Night, October 5, 2019, September 26, 2020
- Astronomy Day (Fall), September 26 2020
- Astronomy Week (Fall), September 21 - 27, 2020
- World Space Week, October 4-10, 2020
- Earth Science Week, October 13-19, 2019; October 11-17, 2020

Stay Connected

NORTHEAST – Ali Jackson - Sciencenter, Ithaca, NY

Northeast: NY, VT, NH, ME, RI, CT, and MA

Mid-Atlantic: PA, NJ, MD, DC, DE, OH, and WV

SOUTHEAST – Brad Herring - Museum of Life and Science, Durham, NC

Southeast: VA, NC, SC, KY, TN, LA, MS, AL, GA, FL, and Puerto Rico

South: TX, AR, and OK

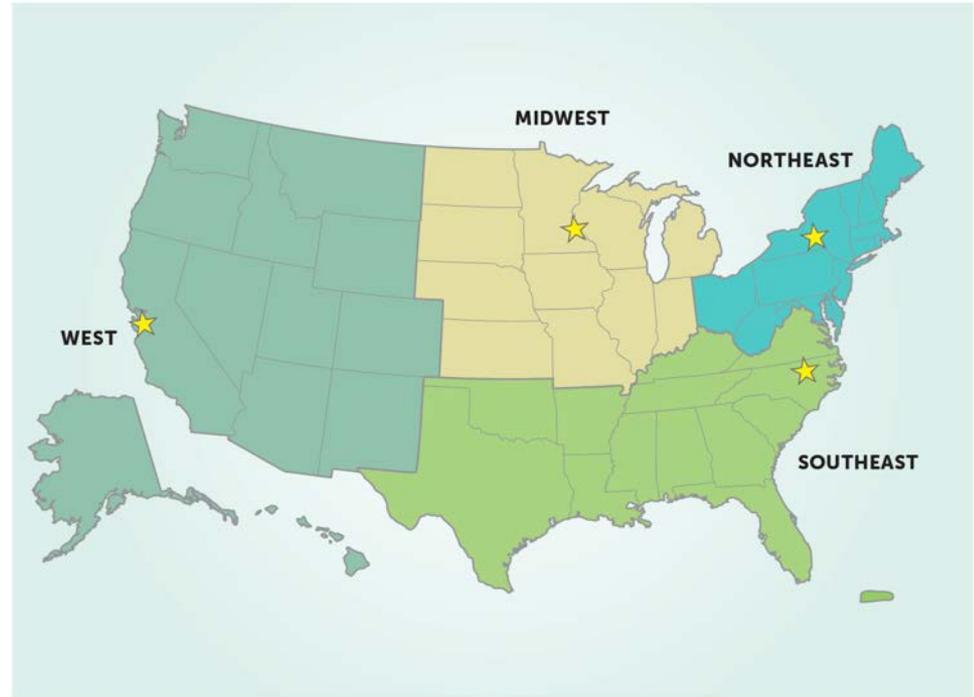
MIDWEST – Christina Leavell - Science Museum of Minnesota, St. Paul, MN

ND, SD, NE, KS, MN, IA, MO, WI, IL, MI, and IN

WEST – Frank Kusiak - UC Berkeley Lawrence Hall of Science, Berkeley, CA

Southwest: CA, NV, AZ, and HI

West AK, WA, OR, ID, MT, WY, CO, UT, and NM

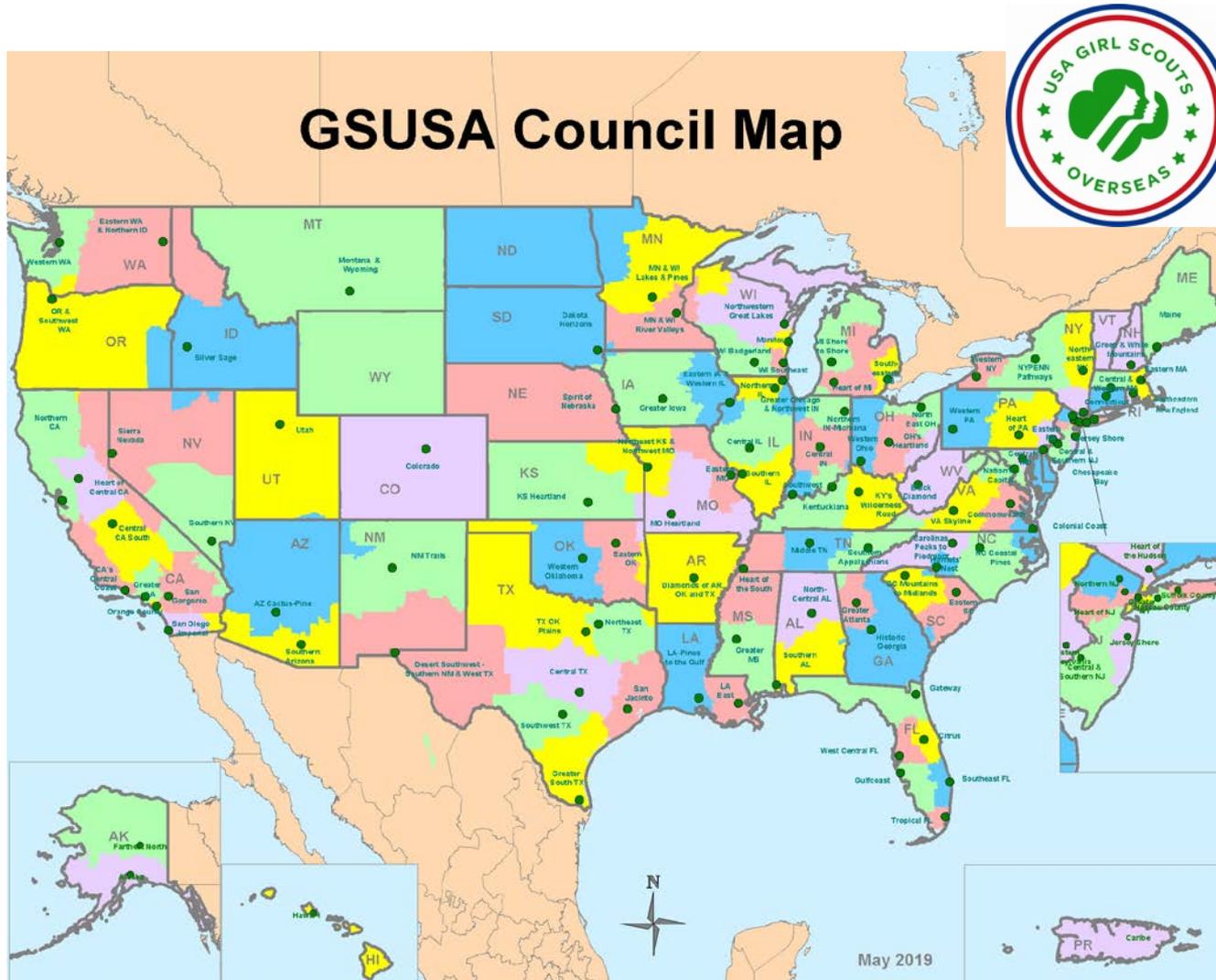


Reaching for the Stars: NASA Science for Girl Scouts



Girl Scout Councils

<https://www.girlscouts.org/en/about-girl-scouts/join/council-finder.html>





Girl Scouts Northern California

Confidence and Curiosity: Girls at the Telescope

Growth and Fixed Mindsets



Fixed Mindset

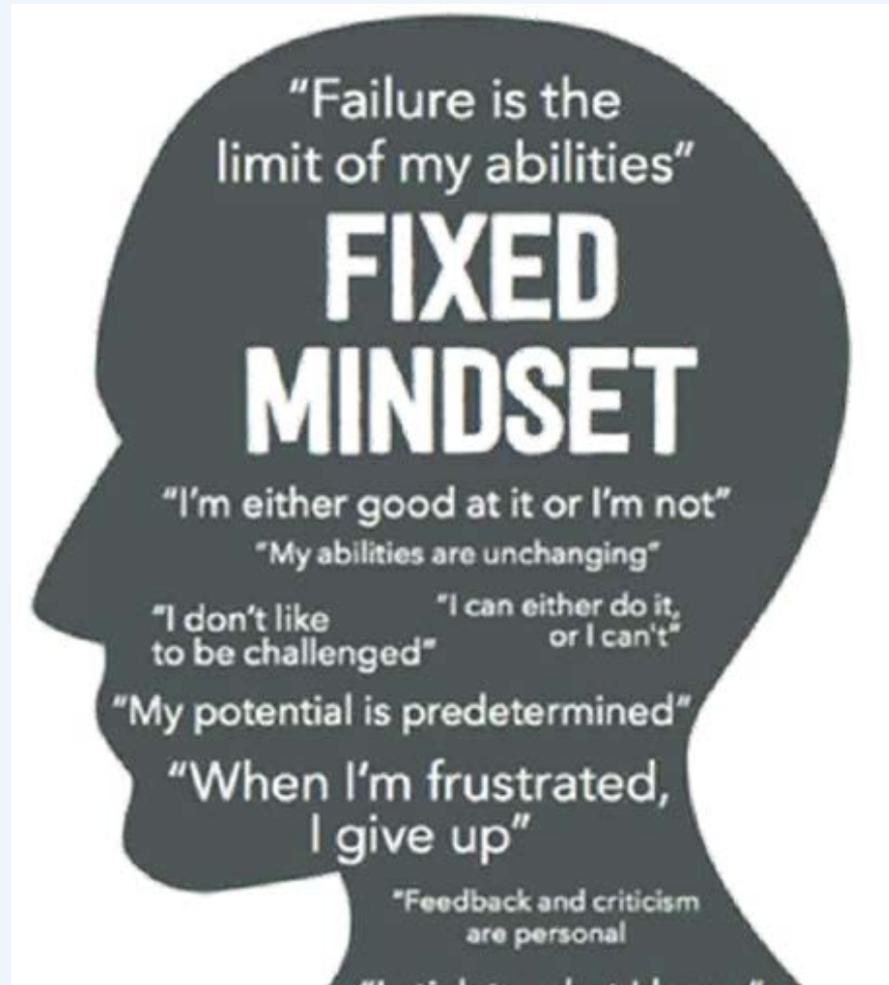
“In a **fixed mindset**, people believe their basic qualities, like their intelligence or talent, are simply **fixed** traits. They spend their time documenting their intelligence or talent instead of developing them.”

Did you hear these growing up:

- You are so smart!
- I guess you aren't a math person.
- You are a natural at this!

These are examples of a “fixed mindset”. Research over the last 20+ years shows that our intelligence and abilities are a lot more flexible!

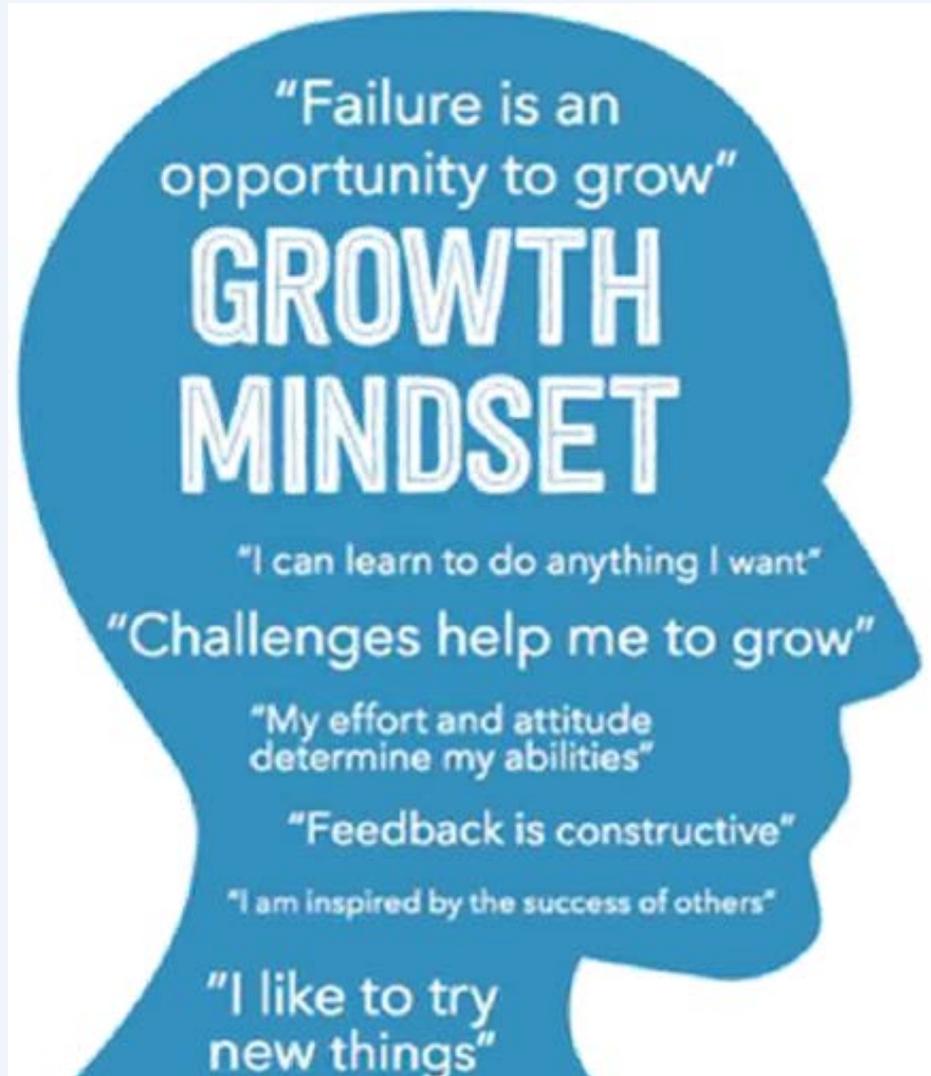
Being an expert
all the time
means there's
no room to grow!



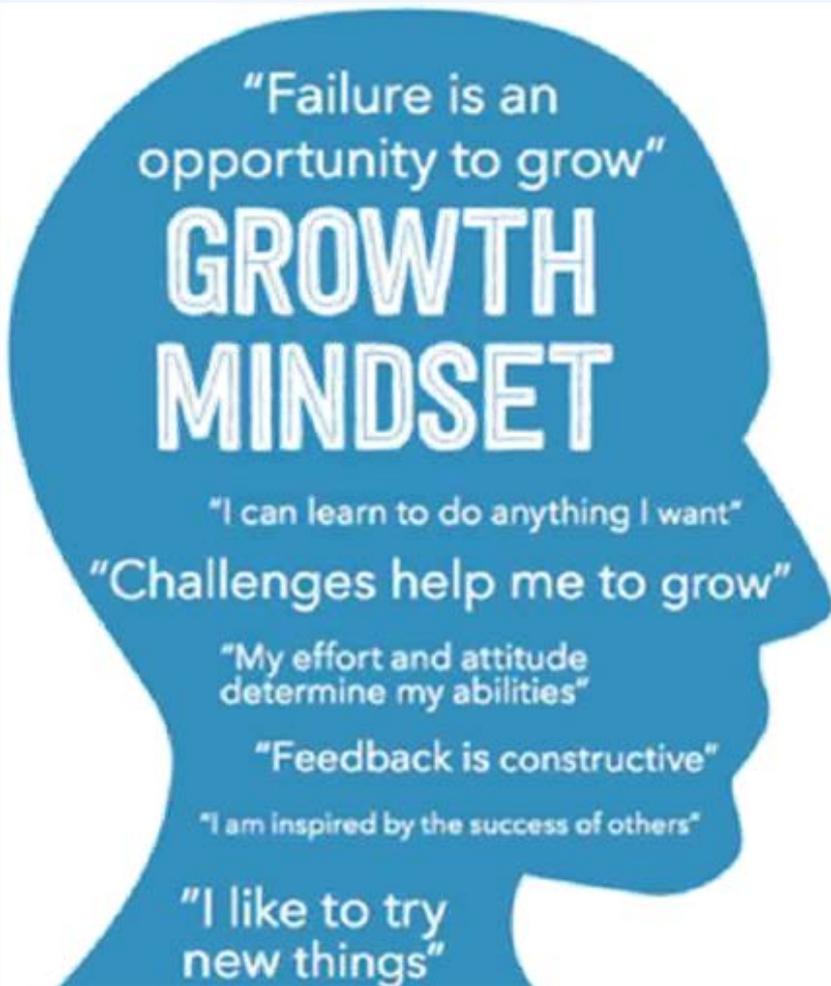
What is growth mindset?

The attitude of:

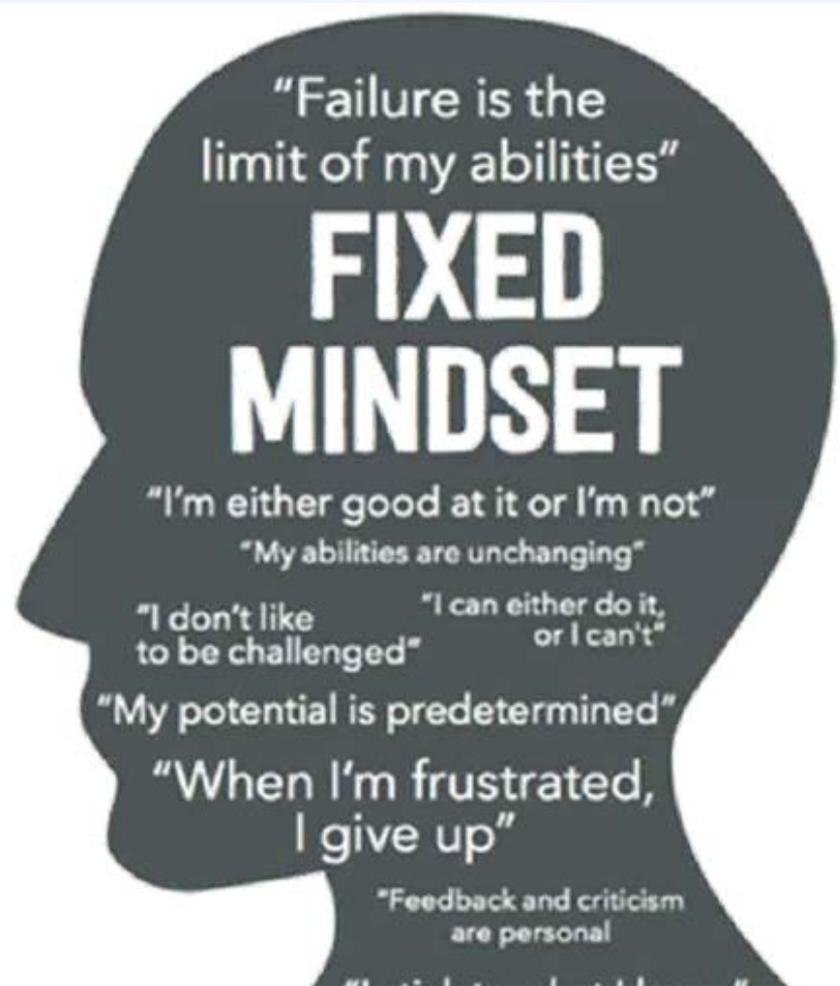
- I can always learn something new.
- I like learning and being challenged.
- If I am stuck, I try new strategies.
- There is no “---” person.



I can learn anything with effort.

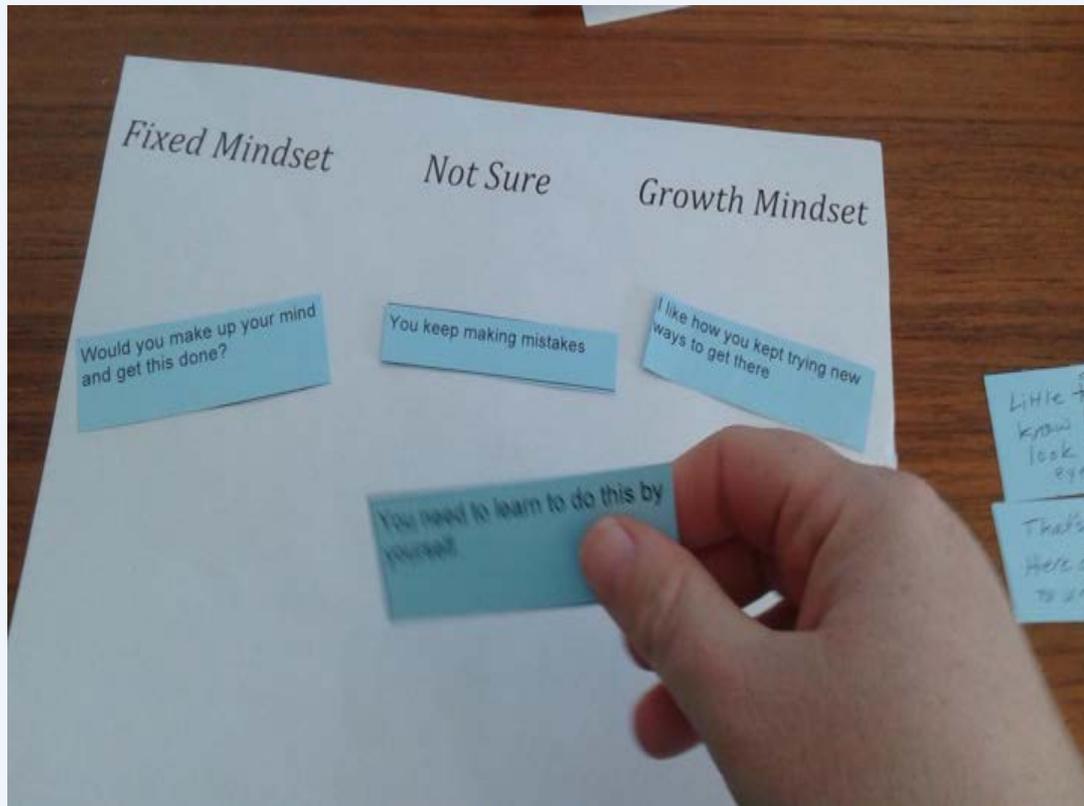


Everyday Learner



Everyday Expert

Group Activity



Activity

- I will show you a phrase.
- Vote in the poll if the phrase is “Growth Mindset”, “Fixed Mindset” or “Not Sure”.

I wish I was as smart as
you are!

It can be challenging to learn the
night sky.

So after tonight, you'll be even
better at it.

You really are a
science person!

Your practice is paying off!

Adjusting the telescope is
hard - let me find that for you.

“You’re so smart” trap

- You always have to be smart
- All the other girls feel bad in comparison.
- It’s too vague...



Credit: J D Maddy

Process, over Praise

- Help a girl notice her improvement
- Praise is an end
- process = the possibility of getting better

Calling out Specific Skills

You never know why someone knows something!

“Sounds like you did a lot of research”

The Magic of “Yet”

Any time you hear a girl put herself down, or *you put yourself down*, use the word “yet”.

I’m not good at cooking.

I’m not good at cooking yet!

Not just girls, Not just kids

These tools are for all children and adults. Making astronomy more accessible means everyone wins!



When you are
out in the world...

See how many times you hear others use
fixed mindset language!



The New Girl Scout STEM Program

STEM Focus Areas



Engineering

Computer
Science

Outdoor
STEM

STEM Focus Areas: What's Next



Health

Food

Maker

STEM Strategic Partners

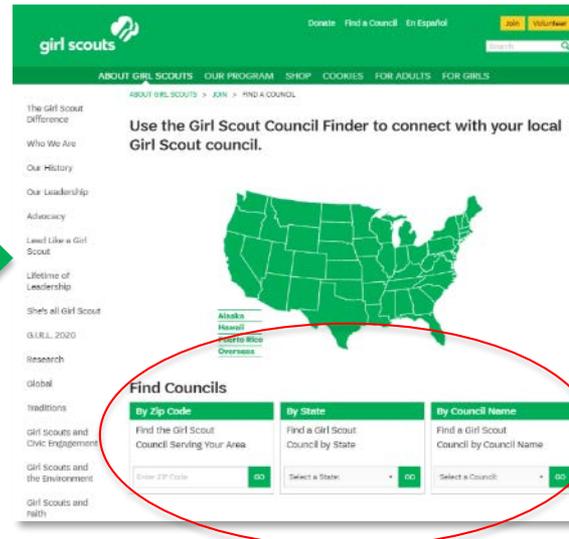


Councils +
Volunteers

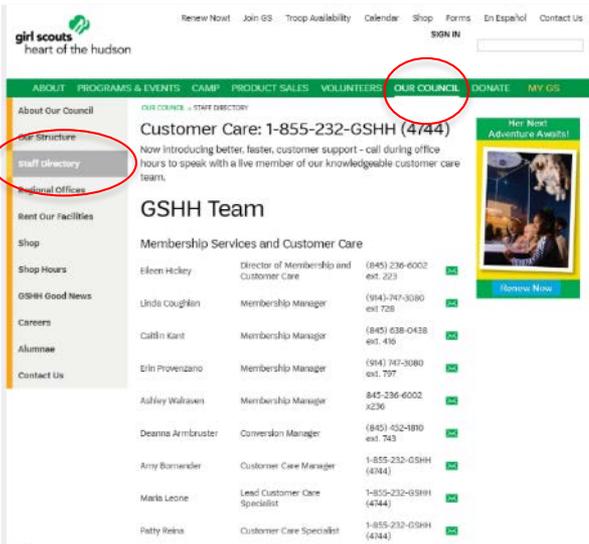
STEM
Organizations
+ Experts

Funders

Steps to Locate Council Partners



1. Visit [girlscouts.org](https://www.girlscouts.org)
2. Click on “Find a Council” on top of bar
3. Select by zip code, state or council name



5. Search contact info for Program, STEM or Girl Experience staff member

STEM Journeys and Badges



Journeys: STEM + Leadership

- * Hands-on challenges — how to solve problems like engineers, programmers and scientists.
- * Take Action project — girls use what they've learned to address a problem.
- * This connects STEM to helping people in the real world.

Badges: STEM + Skills

- * Hands-on activities teach girls specific STEM skills.
- * Building STEM skills builds STEM confidence



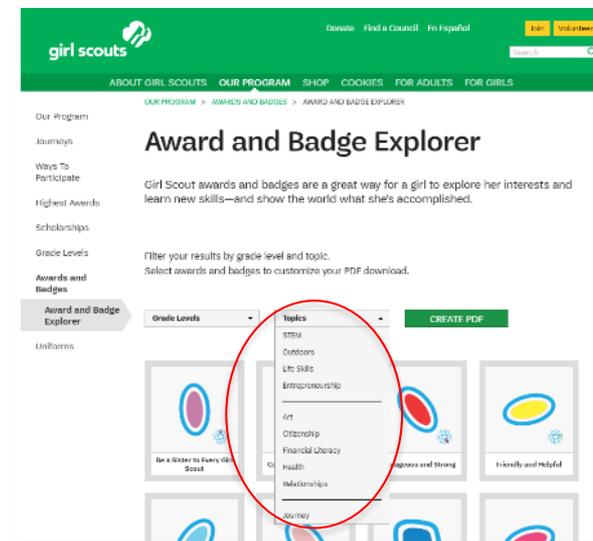
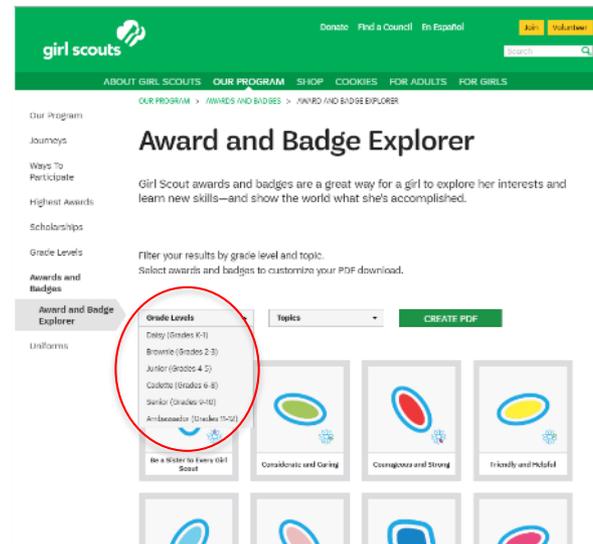
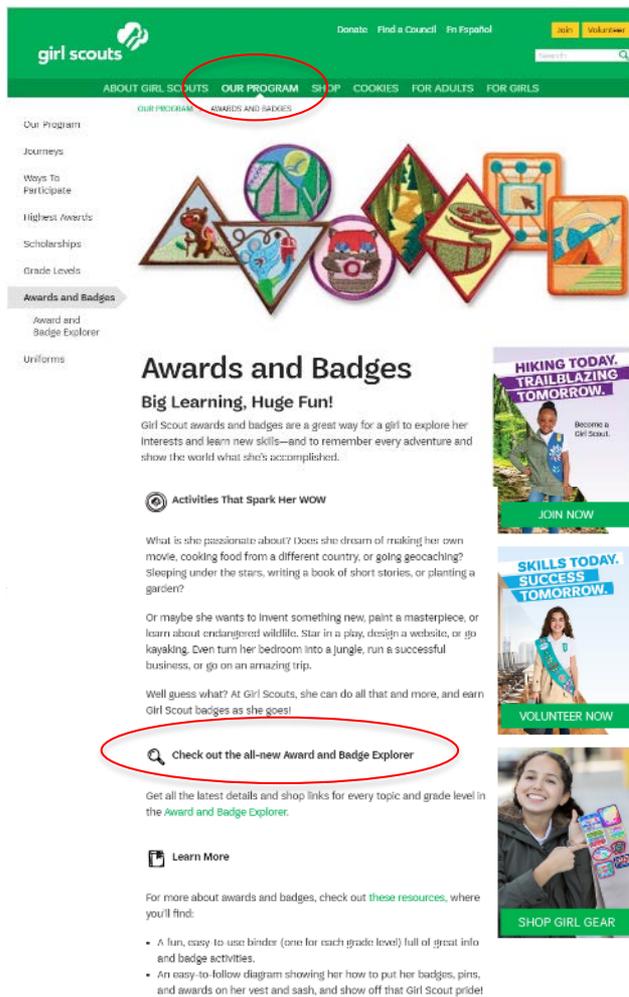
National STEM Outcomes

- * Increased STEM interest
- * Increased STEM confidence
- * Increased STEM competence
- * Understand the value of STEM to society



Navigate Our Award and Badge Explorer

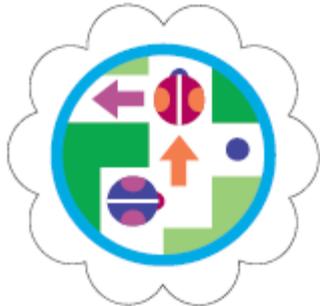
1. Visit [girlscouts.org](https://www.girlscouts.org)
2. Click on “Our Program” on menu bar
3. Click on “Check out the all-new Award and Badge Explorer”
4. Drop down menus allow you to view all national badges by grade levels and topic areas



NEW STEM Badges



DAISIES



Daisy Coding Basics

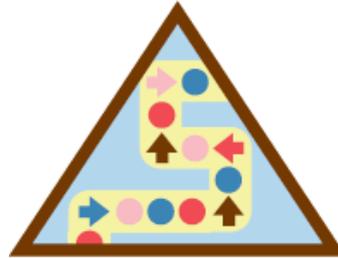


Daisy Digital Game Design

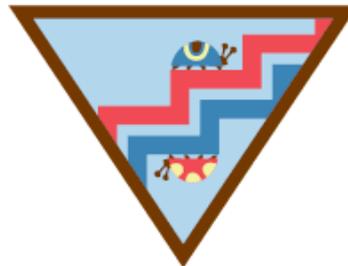


Daisy App Development

BROWNIES



Brownie Coding Basics

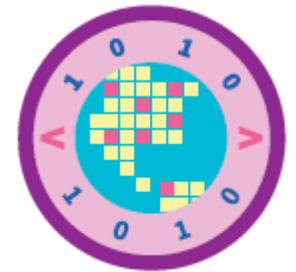


Brownie Digital Game Design

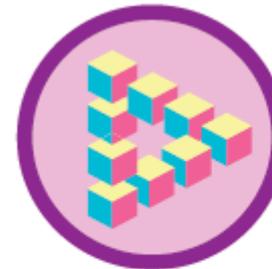


Brownie App Development

JUNIORS



Junior Coding Basics



Junior Digital Game Design



Junior App Development

NEW STEM Badges



CADETTES



Cadette
Cybersecurity
Basics



Cadette
Cybersecurity
Safeguards



Cadette App
Development



Space Science
Researcher



Cadette
Coding Basics



Cadette Digital
Game Design

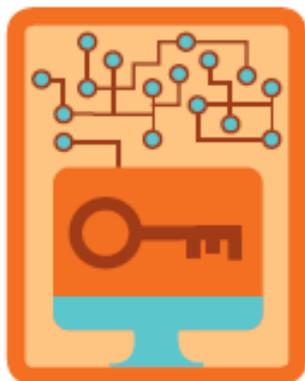


Cadette
Cybersecurity
Investigator

NEW STEM Badges



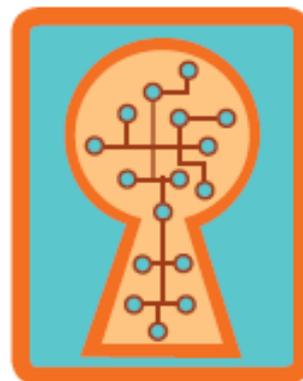
SENIORS



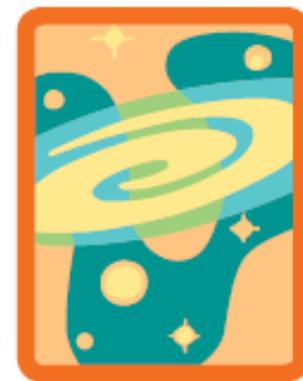
Senior
Cybersecurity
Basics



Senior
Cybersecurity
Safeguards



Senior
Cybersecurity
Investigator



Space Science
Expert



Senior
Coding Basics



Senior Digital
Game Design



Senior App
Development

NEW STEM Badges



AMBASSADORS



Ambassador
Cybersecurity
Basics



Ambassador
Cybersecurity
Safeguards



Ambassador
Cybersecurity
Investigator



Space Science
Master



Ambassador
Coding Basics



Ambassador Digital
Game Design



Ambassador App
Development

NEW STEM Journeys for Older Girls



CADETTES



Cadette Think Like
a Citizen Scientist

SENIORS



Senior Think Like a
Citizen Scientist

AMBASSADORS



Ambassador Think Like
a Citizen Scientist

Space Science Badges For All!



Daisy



Brownie



Junior



Cadette



Senior



Ambassador

A Deep Dive: Space Science Researcher for Cadettes



Space Science Researcher

Scientists have used the observation and exploration of light to make discoveries that deepen their understanding of the Sun, stars, and other objects in space. In this badge, you'll re-create some of these scientific experiments, observe the night sky with your own eyes, and explore the possibility of seeing light in new ways.

Steps

1. What more can you see?
2. Explore "invisible" light
3. See the stars in a new way
4. Expand your vision
5. Conserve the night sky

Purpose

When I've earned this badge, I will understand more about the amazing properties of light and how we use it to make discoveries about the Universe and space science.



SORIA telescope

SPACE SCIENCE RESEARCHER | 1

"It's an incredible Universe we're in and how could you do anything but try and learn about it?"

— Vera Rubin, astronomer honored with the National Medal of Science who discovered dark matter

STEP

1 What more can you see?

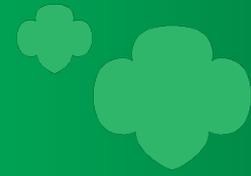
Every step has three choices. Do ONE choice to complete each step. Inspired? Do more!

When you study space science, you are studying light from stars and other objects in space, including our Sun. Because visible light reaches our eyes by bouncing off objects, we see green trees, red cars, and planets of different colors. This light from our star—the Sun—appears to be one color. Is it possible it's made of all the colors we see? Let's find out!

3 Choices:

- Construct a spinner
- Make prism pictures
- Create a rainbow

A Deep Dive: Space Science Researcher for Cadettes



STEP

2 Explore “invisible” light

The light we see with our eyes, called visible light, is just a small part of the light around us. All light is made up of energy, and some types of light have more energy than visible light: UV, X-rays, and gamma rays. Some types of light have less: infrared, microwaves, and radio waves. We call all of these different types of light the electromagnetic spectrum—even the light we cannot see! Dig deeper to explore this “invisible” light.



3 Choices:

- Make a Sun print
- Detect Infrared signals
- Explore more than the eye can see

STEP

3 See the stars in a new way

As the Earth orbits the Sun (our Solar System’s star), our view of the sky changes from night to night and from season to season. Use your eyes, take photographs, and learn to see the stars in a new way.



3 Choices:

- Be an astrophotographer
- Observe with NASA
- Classify the stars

A Deep Dive: Space Science Researcher for Cadettes



STEP

4 Expand your vision

Thousands of years ago, people began cataloging the stars by brightness and organizing the sky into constellations for calendaring, knowing when to plant and harvest, navigating, and passing down moral codes. Then, in the 1600s, the invention of the telescope helped to expand their view. Expand your view by looking up and exploring the night sky.



3 Choices:

- Be a night sky observer
- Find a dark sky
- Observe with a telescope

STEP

5 Conserve the night sky

Darkness at night is good for living things. When there's too much light at night, it wastes energy and has negative effects on the health and safety of animals, including humans. This excess light is called light pollution. Lights shining toward the sky, using energy in a way that has no benefit to us, is an example of light pollution and negatively affects the work of astronomers. Find out ways you can help fix light pollution in your area and beyond.



3 Choices:

- Become a citizen scientist
- Look at light with new eyes
- Make a change

A Deep Dive: Space Science Expert for Seniors



Space Science Expert

For most of human history, the planets and stars have only been tiny points of light, floating in a dark sky many millions—or even trillions—of miles away. People began by organizing the sky into constellations, cataloging the stars by brightness, and, then the invention of the telescope harnessed the power of light and expanded our view! Now, it's your turn to explore light and discover what it teaches us about the Universe!

Steps

1. Uncover the stuff you're made of
2. Explore the brilliance of the stars
3. Discover telescopes as light collectors
4. Find the light in the darkness
5. Share your knowledge

Purpose

When I've earned this badge, I will understand more about the Universe—my place in it and how light is used to make discoveries about it.

"It takes a cosmos to make a human; we are all made of stardust."
— Jill Tarter, Trustee and Emerita Chair for SETI Research at SETI Institute

SPACE SCIENCE EXPERT | 1

STEP 1 Uncover the stuff you're made of

Every step has three choices. Do ONE choice to complete each step. Inspired? Do more!

When a massive star explodes at the end of its life—an event called a supernova—the star's elements scatter into space. Over time, elements made during the supernova, including those heavier than iron, are recycled into new stars and planets. The naturally occurring elements found on Earth were once at the heart of a star. Since humans are made up of the elements, we are literally made of stardust.

3 Choices:

- Make a stardust self-portrait
- See how your eyes react to light
- Explore a universe without supernovae

A Deep Dive: Space Science Expert for Seniors



STEP 2 Explore the brilliance of the stars

Elements, the basic building blocks for all things, are everywhere. Cars, buildings, trees, birds, and even our bodies are made of the elements—but where did they come from? Scientists have discovered that most of the elements were made in stars! The iron in your blood and the calcium of your bones were once part of a star! In this step, explore what happens when stars live and die.

3 Choices:

- Play a game
- Scrapbook the lives of stars
- Go on a nighttime scavenger hunt

STEP 3 Discover telescopes as light collectors

Telescopes are tools that expand your ability to explore the Universe. They gather more light than just your eyes, enabling higher resolution, and magnify the image you're observing. Let's see why bigger telescopes help you see more.

3 Choices:

- Compare your eyes to telescopes
- Create a pointillist image
- Discover why telescopes are so powerful

A Deep Dive: Space Science Expert for Seniors



STEP 4 Find the light in the darkness

We learn about the Universe by collecting and analyzing light. What can we discover from this light? How far away are the Moon, the planets, and the stars? Are there planets around distant stars? Does light give us these answers? Let's explore some of the ways scientists determine the distances of objects in the Universe.



3 Choices:

- Explore standard candles
- Join the citizen scientist movement
- Discover “shifting stars”

STEP 5 Share your knowledge

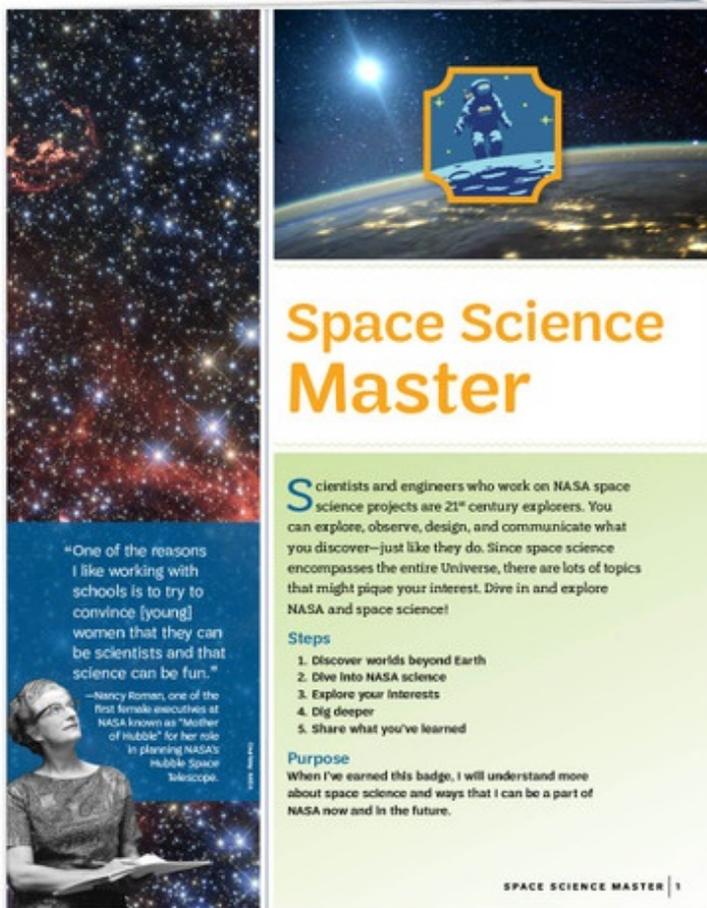
Now that you've explored the Universe and how we study it, it's time to share your astronomy knowledge with others. Scientists are passionate about sharing their findings and any new questions they may have. Choose a topic that sparks your interest and use your creativity and knowledge to create something that helps make space science compelling to others.



3 Choices:

- Host a cosmic lifestyle performance
- Practice astrophotography
- Picture a telescope

A Deep Dive: Space Science Master for Ambassadors



Space Science Master

Scientists and engineers who work on NASA space science projects are 21st century explorers. You can explore, observe, design, and communicate what you discover—just like they do. Since space science encompasses the entire Universe, there are lots of topics that might pique your interest. Dive in and explore NASA and space science!

Steps

1. Discover worlds beyond Earth
2. Dive Into NASA science
3. Explore your interests
4. Dig deeper
5. Share what you've learned

Purpose
When I've earned this badge, I will understand more about space science and ways that I can be a part of NASA now and in the future.

“One of the reasons I like working with schools is to try to convince [young] women that they can be scientists and that science can be fun.”
—Nancy Roman, one of the first female executives at NASA known as “Mother of Hubble” for her role in planning NASA’s Hubble Space Telescope.

SPACE SCIENCE MASTER | 1

STEP 1 Discover worlds beyond Earth

We live on planet Earth, an island of life in the Universe, but is there life beyond Earth? On Mars? Under the icy surfaces of Jupiter’s moon, Europa, or Saturn’s moon, Enceladus? Or on exoplanets orbiting distant stars? Today, using telescopes and spacecraft, scientists are seeking evidence of life elsewhere.

3 Choices:

- Design a habitat for an alien world
- Make a postcard or a tourist brochure
- Explore new worlds

Every step has three choices. Do ONE choice to complete each step. Inspired? Do more.

A Deep Dive: Space Science Master for Ambassadors



STEP

2 Dive into NASA Science

The Science Mission Directorate is the part of NASA that leads scientific exploration, enabled by access to space. Most of space science is about looking up and out at the Sun, Solar System, stars, and galaxies—but at NASA, space science also includes looking down at the Earth from above. Look at the box on this page to learn more. Which of NASA’s divisions interest you the most? Choose one that you’ll explore over the next three steps, or sample from each as you complete the badge.



3 Choices:

- Discover careers
- Explore NASA’s Science Mission Directorate
- Get involved with STEM at NASA

STEP

3 Explore your interests

Dive in and explore space science firsthand. For example: As a scientist, it’s important to dig deep and ask questions. By doing so, you will learn that this can lead to even more questions and discoveries. Find avenues to explore your interests, and see where your observations lead you.



3 Choices:

- Compare your eyes to telescopes
- Create a pointillist image
- Discover why telescopes are so powerful

A Deep Dive: Space Science Master for Ambassadors



STEP

4 Dig deeper

Take everything you've learned and put it into practice. Use this opportunity to share your discoveries with your friends and family. As a scientist, it's important to share findings with colleagues—explore a medium that speaks to you.

3 Choices:

- Contribute to the science community
- Plan a field trip
- Become a researcher

STEP

5 Share what you've learned

An important part of the research process is sharing what you've discovered. Scientists present at conferences and seminars and publish their findings. In this step, you will share what you learned, observed, and enjoyed in the process of earning this badge.

3 Choices:

- Go digital
- Express yourself through visual art
- Design and present a performance piece

**UPCOMING
PROFESSIONAL
DEVELOPMENT**

Upcoming Online Workshops



Online Workshop: Programming for Audiences with Special Needs

Tuesday, November 19, 2019

2pm-3pm Eastern / 11am-12pm Pacific

Using Your Explore Science: Earth & Space Toolkit Outdoors: Practical Advice for Collaborations and Logistical Aspects

Tuesday, December 10, 2019

2pm-3pm Eastern / 11am-12pm Pacific

Learn more at nisenet.org/events



The screenshot shows a Ryver forum interface. On the left is a dark blue sidebar with navigation options: Search, Notifications, Task Stream, Personal Tasks, FORUMS (with an expandable arrow), TEAMS, and PEOPLE. Under FORUMS, there are links for Planetarium Shows, General Conversation, Explore Science: Earth & S... (highlighted), Apollo 50th Conversations, and Tasks and Requests. The main content area is titled 'Explore Science: Earth & Space Toolkits' and has tabs for CHAT and TOPICS. A list of topics is shown, each with a red pin icon, a title, a reply count, and a user profile picture. The topics are: 'Extending the Earth & Space Online Workshop Conversations' (3 replies, Brad Herring replied 28 days ago), 'Earth & Space toolkit - suggestions for hacking or extending the activities' (3 replies, Christina Leavell replied 29 days ago), 'Learn More about the NISE Network' (1 reply, Christina Leavell replied 29 days ago), 'Introductions' (5 replies, Brad Herring replied 29 days ago), and 'Ryver Quick Start Guide' (1 reply, Jeff Nee created Jun 7).

Extending the Online Workshop conversation via the Museum Alliance's Ryver online forum. Sign up here: <https://museumalliance.ryver.com/application/signup/guests/TGcXfWsrarSC7I>

2019 Annual Partner Survey

- Email invitations will be sent in November
- In order to learn more about your experiences in the NISE Network and with presenting Earth and space science content
 - We want to hear from partners across a diversity of roles, institution types, geographical regions, and levels of Network involvement
 - Whether or not you completed last year's survey
 - Even if others at your organization have participated
- Contact Marta Beyer at mbeyer@mos.org with any questions

Get Involved

Learn more and access the
NISE Network's online digital resources
nisenet.org

Subscribe to the monthly newsletter
nisenet.org/newsletter



Follow NISE Net on social networking
nisenet.org/social



Questions?

Thank You



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