

Space Exploration

Interest Project Patch Guide

For Cadette and Senior Girl Scouts



BRIDGING
T H E
GAP

**A Collaboration
Between
Discovery Place, Inc.
and Girl Scouts, Hornets' Nest Council.**

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Space Exploration Interest Project Patch Guide

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These activities correspond to the activities found on pages 76-77 in *Interest Projects for Cadette and Senior Girl Scouts*. They are designed to be fun, easy and inexpensive. The layout of each activity contains simple instructions for preparation. All GSUSA guidelines should be followed when doing these activities.



Introduction

Who, What, Why, When, Where, and How?

Who?

You, of course! This Bridging the Gap Interest Project Patch Guide was written to give Cadette and Senior Girl Scouts extra resources to make it easier to investigate science, engineering, and mathematics Interest Project Patches.

What?

What is Bridging the Gap (BTG)? Bridging the Gap is a nationally recognized science education program developed specifically for Girl Scouting. BTG promotes the idea that girls can learn and have fun exploring science, engineering, and mathematics activities when given the opportunity to try them in a girl-friendly environment.

You may have already tried BTG activities as a Daisy Girl Scout, Brownie Girl Scout, or Junior Girl Scout and know how fun they can be. Fun is of special importance to Bridging the Gap. After all, **LEARNING IS DIRECTLY PROPORTIONAL TO THE AMOUNT OF FUN YOU HAVE!**

Why?

Why do Bridging the Gap activities? Understanding science and mathematics and being comfortable with engineering and technology can help you succeed in any career path you choose. If you dream of becoming an astronaut or a marine biologist, you know you need strong math and science skills. What many people do not realize is that in today's world, science, math, and technology play a major role in everything we do. So if instead, you dream of becoming an artist, an athlete, or business person, you will be better prepared if you have a strong background in science and mathematics. Here are the facts:

- Women with good math skills earn more than women without these skills;
- Engineering will be among the highest paying and fastest growing occupations over the next decade; and
- The fastest growing occupations all require strong backgrounds in science, technology, math and/or engineering.

When?

You can work on your Interest Project Patch whenever you want to do so. Use the Planner Page and Outline to decide which activities you want to do and plan when you want to complete them. One of the great things about being a Cadette or Senior Girl Scout is that you plan your own activities. Just remember to consult with your troop leader or an adult advisor and always follow Safety-Wise guidelines.



Where?

Bridging the Gap activities can be done almost anywhere—at home, at troop meetings, at service unit or council events, at school, or any place you find Girl Scouts. You can even complete some of the activities over the Internet. Some activities require electricity or access to hot water, but each activity section will list what you need before you begin.

How?

How do you know if you want to try this Interest Project Patch? Try the Get Started Activity first. To complete the patch requirements, you must choose at least 7 activities:

- 2 Skill Builder activities
- 1 Technology activity
- 1 Service Project activity
- 1 Career Exploration activity
- 2 more activities from any category you choose

The Get Started Activity counts as one of the seven required activities, leaving only six to complete the Interest Project Patch. Each activity in this Interest Project Patch Guide will help you complete a different Skill Builder or Technology activity and will have more suggestions for possible Career Exploration activities and Service Projects. Additional links are provided to help you connect this Interest Project Patch to a future Gold or Silver project.

Space Exploration Activities at a Glance

Read the activity descriptions below and then try the *Get Started with Pop Rockets* to see if you would like to learn more about the subject of this Interest Project Patch. Then refer to pages 76-77 of *Interest Projects for Cadette and Senior Girl Scouts* and the corresponding activities in this guide to decide which activities you want to do to complete your Interest Project Patch.

What do you think about when you hear the words "Space Exploration"? Do you think about flying on the space shuttle or traveling to Mars? What about exploring the universe by using powerful telescopes that can see distant galaxies and search for planets around stars besides our own Sun? Would you like to live aboard the International Space Station? Except for the trip to Mars, all of these things are possible today. As for the trip to Mars, NASA is working on it.

In the *Get Started with Pop Rockets* activity you get to be a rocket scientist. Explore the basics of rocket design while building your own rocket as you complete Technology 5.

Additional activities in this guide will help you to:

- Find out how we use starlight to explore the universe for Skill Builder 1.
- Learn about light and lasers while you find out about today's telescopes for Technology 1.
- Step aboard the International Space Station and discover how countries from around the world are working together to live in space for Skill Builder 6.
- How long will it be before we can travel to Mars anyway? Explore some of the challenges of interplanetary travel as you complete Technology 3.

These activities are only suggestions. Some of the activities will go beyond the basic suggestions in the Interest Project Patch requirements listed in *Interest Projects For Cadette and Senior Girl Scouts*. If an activity in this book isn't interesting to you, change it or choose another activity. Remember, this is your Interest Project Patch!



Space Exploration Planner Page

Make a copy of this sheet to plan your Interest Project Patch activities.

My Interest Project Patch Plans

My two Skill Builders are:

1)

2)

My Technology activity is:

1)

My other activities are:

1)

2)

My Service Project is:

1)

My Career Exploration activity is:

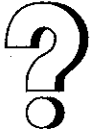
1)

My Gold or Silver links could be:

Explanation of Icons



Pay close attention or else!



Here's a question for you



What's happening and why



Technical information



Extra tips and hints



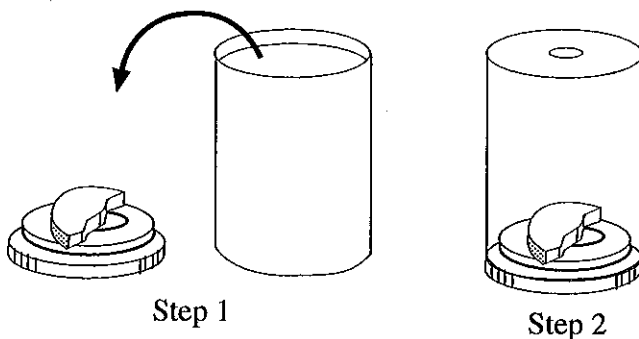
NOTES

Lined area for taking notes.

4. Watch what happens when the tablet dissolves. How long does it take for the tablet to dissolve completely? How much does the closed bag puff up? The bag puffs up because all of the **carbon dioxide** gas produced by the Alka-Seltzer® is trapped inside the bag.

What do you think would happen if the same amount of Alka-Seltzer® was dropped into water inside a small closed container that could not expand like the resealable bag did? Try the next experiment to find out.

1. First of all, put on your safety goggles or glasses and find a safe (see safety notes) open area in which to work. This should give you a hint!
2. Fill one of the empty 35mm film canisters 1/3 full of room temperature water.
3. Place 1/2 tablet Alka-Seltzer® on the bottom side of the film canister lid. Drop the 1/2 Alka-Seltzer® into the water in the film canister by quickly flipping the lid over onto the top of the canister and then sealing the film canister shut.



4. Quickly put the film canister down, with the lid end on the ground, and move at least 6 feet away. Watch what happens!



If the canister did not fly up with a "pop" after one minute, try again. The lid may not have sealed tightly.



NOTES

What's
Happening and
Why?

Alka-Seltzer® and similar antacid tablets are made of three basic active ingredients: aspirin, sodium carbonate and citric acid. Sodium carbonate is just another name for baking soda and citric acid is a natural fruit acid, which is found in lemon and other juices. Citric acid is added to some powdered soft drink mixes and sour candies to give them a tart, tangy, or sour taste.

As long as the citric acid and baking soda stay dry they will not react with each other. This is why these antacid tablets are sold in plastic lined, foil pouches. The packaging makes sure that they stay dry. Once you open the package and drop the tablets into a liquid like water, the water, baking soda and citric acid start to chemically react with each other to make something else--sodium citrate and carbon dioxide gas.

When a tablet is dropped into a container that cannot expand, like a film canister, the sodium citrate and some of the carbon dioxide dissolves into the water trapped in the film canister. However, as the tablet continues to react with the water, too much carbon dioxide is produced and the pressure builds until the force is strong enough to push the lid off the film canister. All of the carbon dioxide gas, water and everything else inside is forced out. The force of this mixture and the lid flying out in one direction is powerful enough to create a force, which will push the film canister in the opposite direction and make it fly up into the air. Isaac Newton first wrote about this discovery that every force creates an equal and opposite force in 1687. Today we call it **Newton's Third Law of Motion.**

Basically, this means that if you want to increase the force pushing the film canister up, you need to increase the force of the lid and other stuff flying out of the bottom of the film canister.

But how do you increase the force? **Newton's Second Law of Motion** describes **force (F)** as being equal to **mass (m)** times **acceleration (a)** or in math terms, **F=ma**. **Mass** is



NOTES

What's Next?



Other factors that could make a difference are how tight the lid fits in the film canister and how much Alka-Seltzer® you use. Do you need to use 1/2 tablet? What would happen if you used more or less Alka-Seltzer®? Even though in general, the more water and other stuff you have flying out of the bottom will increase the force pushing the canister up, you could put too much water in the canister. If the film canister is full of water, there may not be enough room to hold much carbon dioxide gas before it "pops".

You are the expert on what works best for your propellant system. Use what you have learned to design the best, most powerful Alka-Seltzer® propellant system you can to blast your film canister rocket engine the farthest distance.

Now that you have designed your film canister engine, it's time to build the rest of your rocket. You can use the pieces suggested on the Rocket Activity Sheet or you can design your own.

1. Choose what type of paper you want to use.

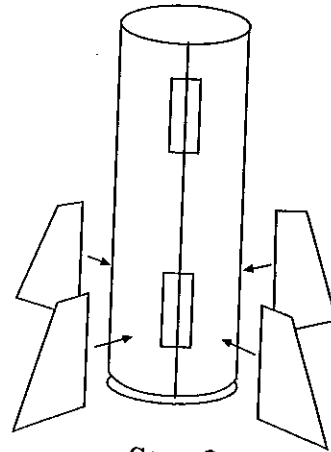
If you choose to use the activity sheet, you can:

- a) Make a photocopy, or
- b) Draw your own copy with paper and pencil

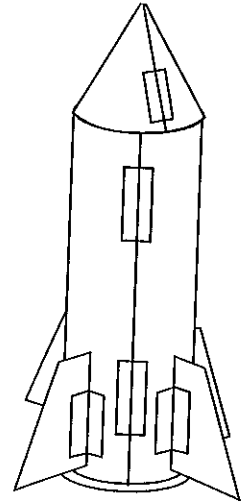
*When building your rocket, remember Newton's Laws, especially **force equals mass times acceleration**. If you want to have your rocket fly fast and far, you have to keep the weight (**mass**) small so most of the **force** becomes **acceleration**. In short, do what NASA does. If you want a fast high-flying rocket, make it as lightweight as you can. Remember that sometimes the lightest materials can also be the most fragile, which means your rocket could be destroyed when it lands. Real NASA rocket designers also have to figure out how to make a light, but strong, rocket.*



NOTES



Step 3



Step 4

Your rocket is now completed and ready to launch.

1. Gather the rocket engine materials you need such as the Alka-Seltzer® and water and your safety goggles or glasses. Move to a safe outdoor launch area.
2. Prepare your rocket for firing by turning it upside down and adding the water to the film canister.

Be careful not to spill water on your paper rocket because it can destroy the paper rocket body.

3. Make sure you have the film canister lid in your hand before you add the Alka-Seltzer® to the water in the film canister. Put the cap on quickly, place the rocket on your launch area, quickly step back at least six feet and watch it blast off.

How did your rocket fly? Did it suffer any damage when it landed? Can you think of ways to improve it? Are there other materials you would like to try using to build it? Will different fin designs and body lengths make a difference? These can also affect how straight and stable your rocket is when you launch it. Experiment with different rocket materials and designs.





NOTES

Corresponding Activity

Big Idea

Time

Materials

Safety

Clean-Up

Do it!

Starlight, Starbright

Space Exploration, Skill Builder 1
p. 76, Interest Projects for Cadette and Senior Girl Scouts

Are all the stars you see in the night sky the same? How can you know if they are alike or different? Can starlight tell you anything about the universe? Find out for yourself in this activity for Skill Builder #1.

60 minutes minimum

From your leader:

- Night Spectra Quest card

To Get Yourself:

- Sunlight
- Different sources of light such as regular incandescent, fluorescent, neon and sodium or mercury street lights

Check with an adult first and have a buddy when you are outside at night. Observe all safety wise precautions. Never look directly at the sun when observing sunlight. Look up in the sky next to the sun instead.

None required

Have you ever noticed the rainbow patterns formed when light hits the shiny side of a CD just right? Back in the 1660's, Isaac Newton discovered white sunlight was really a mixture of light of different colors. Newton used a prism to separate white light into the different colors red, orange, yellow, green, blue, indigo and violet which make up the visual light spectrum. However you don't always need a prism to see the light spectrum. When light shines through a diffraction grating or reflects off something with lots of closely spaced lines like the tracks of a CD, white light can also be separated into the different colors that make it up.

Get the Night Spectra card and look at one of the light sources listed through the small hole in the corner which has a diffraction grating inside. Aim the hole at the light source

NOTES**What's Next?**

Later on astronomers discovered that when starlight seen through a telescope was passed through a prism you could see different patterns of bands from different stars. In the last decades of the 1800's, the spectra of thousands of stars were photographed and ways of classifying stars by their spectra were developed. Women astronomers did most of this work. One of the most famous of these women is Annie Jump Cannon, who, while working at the Harvard College Observatory, developed the classification system and star catalog that is still used today.

Just as you could tell the difference between a fluorescent light and a mercury or sodium street light by looking at the different spectra through the diffraction grating, astronomers could start telling stars apart by their spectra. Everything we know about stars today we have learned about by studying their light spectra. The spectrum of a star can tell us how old a star is, how fast it is moving relative to us, what kind of a star it is, what it is made of and how hot it is.

Here are some of the different types of stars that have been identified:

Variable Stars are stars that vary in brightness over time in a regular pattern from bright to dim to bright again. The North Star, Polaris is a variable star.

Globular Clusters are clusters of anywhere from thousands to millions of very old stars which are packed in a small area of the sky. You need a telescope to identify a globular cluster.

Protostars are formed when clouds of cosmic gases and dust start to be pulled together by gravity. It is believed that protostars eventually become stars.

As stars begin to grow old, they expand and change and small stars become **Red Giants** and large stars become **Supergiants**.



NOTES

Corresponding Activity

Big Idea

Time

Materials

Safety

Clean-Up

Do it!

Lasers, Light, and Lenses

Space Exploration, Technology 1
p. 77, Interest Projects for Cadette and Senior Girl Scouts

Why are today's newest telescopes such as the Hubble, Chandra, and Compton observatories being put into orbit? Learn about light, lasers and lenses for Technology 1 while you discover why outer space is the best place for today's telescopes.

60 minutes minimum

From your leader:

- Laser pointer or key chain
- Small clear plastic jar with straight sides
- Small plastic mirror that will fit in the jar
- Piece of liquid crystal material
- Ultraviolet light detecting beads

To get yourself:

- Water to fill jar
- A few drops of nonfat milk or a pinch of powdered nonfat milk, cornstarch, or flour
- A dark room
- Sunlight

Even low-powered lasers sold as key chains can cause eye damage if used incorrectly. Never shine a laser into your own or someone else's eyes. When doing these experiments, be careful that the laser light does not accidentally bounce into someone's eyes.

Wash the jar with soap and water when you finish the activity.

Light and its behavior have fascinated people from ancient times to the present. Having fun with small lasers is part of this fascination.



NOTES

One way to see the laser light as a whole beam is to shine it through something with small particles in it that will scatter the laser light. A special fog is used at concerts and laser shows to do this. However you can use things found in your kitchen to recreate the same effect.

1. Fill a small, clear plastic jar with room temperature water and move to a darkened room. If you shine the laser light through the plain water you still will not be able to see the beam.
2. Now mix a tiny bit of nonfat milk, cornstarch, or flour into the water to make the water barely cloudy. Shine the laser light through the jar. Can you see the beam now?

This works best with a few drops of nonfat milk added to the water because the milk particles are smaller than the particles of cornstarch or flour. If you cannot see a beam of light shining through the jar, you probably have put too much in the water and it is too cloudy. If this is the case, pour some of the cloudy water out and add some more clear water and try again. Repeat if necessary.

Regular milk and 2% milk does not work as well because the fat in the milk will not mix with the water.

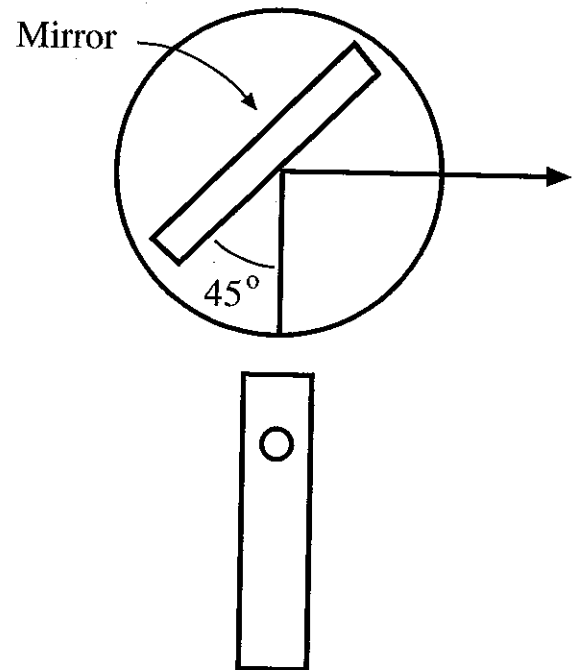
Because laser light travels on a narrow beam, it makes it easy to see how light behaves and you can observe the properties of light called **reflection** and **refraction**. **Reflection** describes what light does when it bounces off a shiny object, such as a mirror. **Refraction** describes how light bends when it passes through different materials such as air, water, plastic, and glass. Use your laser and jar of cloudy water to see how light is bent, or **refracted**.





NOTES

To see **reflection**, you will need to use the small plastic mirror. Shine the laser light on a wall in front of you (remember not to shine it directly at anyone) and see where the red dot is located on the wall. Hold the shiny side of the mirror at a 45° angle in front of the laser. Where did the red dot move? Change the angle of the mirror and see what happens to the red dot. To see what is happening to the beam of light, put the mirror into the jar of cloudy water. Shine the laser light into the water and have the beam hit the mirror at a 45° angle. Can you see how the light bounces off the mirror?



**What's
Happening and
Why?**

Experiment by having the light hit the mirror at different angles and see what happens.

To truly understand how a laser works you need to understand more about how light behaves. LASER is really an acronym for Light Amplification by the Stimulated Emission of Radiation. The type of radiation emitted from your laser is the red light you saw. Light is a special type of radiation called **electromagnetic radiation**. The small laser uses a lot of sophisticated physics that you might want to explore further.



NOTES

More to Explore

Learn more about NASA's space telescopes and lasers, light and electromagnetic radiation. NASA has some great Internet sites where you can see images from the Hubble and other space telescopes.

Career Links

Assume the role of an astronomer and research the effect of light pollution on your own. Go to www.plugged-in.org and click on the Girls Science Network and investigate the Case of the Missing Stars activity.

Service Project Links

Present the 'Making Rainbows' activity from the Bridging the Gap *Science in Action Brownie Girl Scout Leader Guide* to younger Girl Scouts.

Gold and Silver Ideas

How does learning about electromagnetic radiation relate to doing a Gold or Silver project? Because light and other types of electromagnetic radiation are around us all the time, we often take them for granted. Try to identify how electromagnetic radiation is a part of your project whether it comes from the light and heat from a campfire, the sunshine of a beautiful day, the colors of nature, or the images of visible light captured on film through the lens of a camera.



NOTES

While NASA has many websites with information about the International Space Station, a great way to find out what other countries are doing to explore space is to look on their websites. Many other countries around the world also have their own space agencies and websites. These international websites usually have versions in English as well as other languages.

Try to arrange access to the Internet for this activity. While you can use written information from the library to find the answers to some of the questions, it is a lot more fun to learn about the International Space Station over the Internet. Go to www.bridginggap.org for links to some websites. If you cannot get on the Internet, have the librarian help you find information on the Canadian Space Agency (CSA), the European Space Agency (ESA), the National Space Agency of Japan (NASDA), Rosaviakosmos in Russia and the Brazilian Space Agency and Instituto Nacional de Pesquisas Espaciais (INPE) in Brazil.

Try to find the answers to the following questions about the International Space Station:

- Can you see the International Space Station in the night sky?
- How long does it take to orbit the earth?
- How big is the International Space Station?
- How much room is there inside for people to live and work?
- Which countries have research laboratories there?
- Which space agencies provide the rockets needed to transport people supplies and other cargo to the International Space Station.



NOTES

Lined area for taking notes, consisting of approximately 25 horizontal lines within a rounded rectangular border.

Corresponding Activity

Space Exploration, Technology 3
p. 77, Interest Projects for Cadette and Senior Girl Scouts

Big Idea

The International Space Station is an important jumping off place to start a trip to Mars. NASA estimates that the first Mars Exploration Team will need to be gone for three years before they return home. Imagine you are a member of that team. Decide what sort of things you need to prepare and pack if you want to make it back home as you complete this activity for Technology 3.

Time

60 minutes minimum

Materials

From your leader:

None required

To get yourself:

Access to the Internet or a library

Safety

No special precautions are necessary.

Clean up

None needed

Do it!

Here is your mission. You are in charge of planning the first manned mission to Mars. The mission will take a total of three years. It will take 6 months to travel to Mars, 6 months to travel back to Earth and you will spend two years living on Mars. How can you make it happen and bring everyone home safely?

You will need to know as much about Mars as possible, so you send a lot of probes and robotic landers to Mars to collect information. You will need to explore the climate, the atmosphere and find the best place to land. How can you provide a three-year supply of food? Can you find water, oxygen to breathe, or anything you can use for fuel on Mars? Will you have to bring everything you need from Earth?

What sort of health problems could your crew encounter during the trip? How will you keep everyone healthy?



Materials List for All Activities

Pop Rockets

Materials

From your leader:

- 4 Round 35 mm film canisters with inside sealing cap
- Alka-Seltzer® or similar antacid tablets
- Ruler
- Scissors
- Safety Glasses or Goggles

To get yourself:

- Resealable sandwich size plastic bags
- Water (hot, cold, and room temperature)
- Cellophane tape
- A coin
- Pencil or pen
- Paper (regular, Construction and/or cardstock)
- Crayons or markers to decorate your rocket (optional)

Starlight, Starbright

Materials

From your leader:

- Night Spectra Quest card

To get yourself:

- Sunlight
- Different sources of light such as regular incandescent, fluorescent, neon and sodium or mercury street lights

Lasers, Light, and Lenses

Materials

From your leader:

- Laser pointer or key chain
- Small clear plastic jar with straight sides
- Small plastic mirror which will fit in the jar
- Piece of liquid crystal material
- Ultraviolet light detecting beads

To get yourself:

- Water to fill jar
- A few drops of nonfat milk or a pinch of powdered nonfat milk, cornstarch or flour
- Dark room
- Sunlight

The International Space Station

Materials

From your leader:

- Nothing required

To get yourself:

- Access to a library or the Internet

Next Stop Mars

Materials

From your leader:

- Nothing required

To get yourself:

- Access to a library or the Internet



Career Links List

Pop Rockets

- Investigate the careers of aerospace engineers. Ask your guidance counselor at school for more information or explore the Women of NASA website at <http://quest.arc.nasa.gov/womwen/>.

Starlight, Starbright

- Find out more about Annie Jump Cannon or Jocelyn Bell. Go to www.sdsc.edu/ScienceWomen/contents.html and starchild.gsfc.nasa.gov for details on these women.

Lasers, Light, and Lenses

- Assume the role of an astronomer and research the effect of light pollution on your own. Go to www.plugged-in.org and click on the Girls Science Network and investigate the Case of the Missing Stars activity.

The International Space Station

- More than 100,000 people who work at space agencies and companies around the world have helped make the International Space Station a reality. NASA alone employs thousands of people in many different jobs. Explore the possibility of working for NASA. Use www.nasajobs.nasa.gov to link to NASA job opportunities.

Next Stop Mars

- Many women astronauts were once Girl Scouts. The <http://spaceflight.nasa.gov> website has links to lots of information about becoming an astronaut.

[List of Service Project Ideas]

Pop Rockets

- Present a rocketry activity for Junior Girl Scouts such as 'Paper Rockets' from the Bridging the Gap *Dabbler Junior Girl Scout Leader Guide*.

Starlight, Starbright

- Organize a star gazing party for younger Girl Scouts. You can find the information you need in the 'Star Party' section of the Bridging the Gap *Science Activities for Cadette and Senior Girl Scouts Leader Guide*.

Lasers, Light, and Lenses

- Present the 'Making Rainbows' activity from the Bridging the Gap *Science in Action Brownie Girl Scout Leader Guide* to younger Girl Scouts.

The International Space Station

- Present a Thinking Day program for younger girls using the International Space Station as a theme.

Next Stop Mars

- Present either the 'Young Astronaut Training' or 'Eating in Space' activities from the Bridging the Gap *Aerospace Junior Girl Scout Leader Guide*.



List of Gold and Silver Interest Project Patch Links

Pop Rockets

- Whether you want to travel into space or not, a strong math and science foundation makes it easier to get there. What math and sciences skills do you need to use as you plan and complete your Gold or Silver project?

Starlight, Starbright

- Scientific skills such as observation, organization, and classification are necessary for many careers. How can you use these skills in your Gold or Silver project?

Lasers, Light, and Lenses

- How does learning about electromagnetic radiation relate to doing a Gold or Silver project? Because light and other types of electromagnetic radiation are around us all the time, we often take them for granted. Try to identify how electromagnetic radiation is a part of your project whether it comes from the light and heat from a campfire, the sunshine of a beautiful day, the colors of nature, or the images of visible light captured on film through the lens of a camera.

The International Space Station

- The International Space Station would not be a reality unless people from different countries and cultures could work together as a team. How are you using teamwork as part of your Gold or Silver project? Is promoting diversity and multiculturalism part of your project?

Next Stop Mars

- If you plan your Gold or Silver project with as much attention to detail as NASA does when planning crewed missions, it will be a smashing success. The leadership and organizational skills you use when you do your Gold or Silver project will help you wherever you want to go in life.



Silver and Gold Projects in Science Real Stories from Real Girl Scouts

Silver Awards

Nicole, age 15
Kennebec Girl Scout Council
Maine

"For my Silver Award project I put together a Mars Science Activity Kit and donated it to my council. The reason I chose to do this project was because I wanted younger girls to be able to know what was happening with Mars, some of the things that may happen in the future, and about Mars in general. I included a list of Web sites, science activities they could do, information about past, current and future missions to Mars, and general information about Mars."

Alicia, age 16
Hi-Low Girl Scout Council

"A friend and I got together to do our Silver Award. We planned and organized a Brownie Girl Scout Earth Day, encouraging Brownies to bring recycled products with them to use for crafts. There were four or five stations, a lunch break, opening and closing ceremonies, and song time (my favorite), where I led all of the girls in crazy songs. We involved several girls from our troop to run stations. Although things were rough at first, they eventually smoothed out and it convinced me to become a teacher because I love kids so much."

Linda, age 13
Mid-Continent Girl Scout Council
Missouri

"My friend and I did a Science weekend. We chose this project because her dad is a science teacher so we would have resources. We also liked this project because we both like kids. We did this for a Brownie troop. It helped them earn the "Science in Action" try-it and it got them a Junior badge, which is one of their bridging requirements. My friend and I learned that Brownies want and can do things for themselves. Third grade Brownies are able to do more than we thought. We also learned the hardships of planning an event. We did have fun making paper and crystals. The Brownies had lots of fun too, and that's the most important part."



Kaity, age 15
Greater New York Girl Scout Council
New York

"I got involved with beach clean ups with my family at our local beach. I decided to make this my Silver Award project (1995) by getting others involved. Through the American Littoral Society, I was given a beach to clean for the National Beach Clean Up. I involved my whole troop as well as the community. We contacted the community through our local newspaper and by hanging flyers all over town. We then asked local merchants to donate drinks and snacks for the volunteers. Before the event, I held a workshop for Girl Scout troops in the area and had the parks department and other community workers talk about our role in cleaning up the beach, erosion, etc. We even made posters for store windows and held a poster contest. This was a lot of hard work for me but it paid off because that year we collected over 1200 pounds of trash and had some very unusual finds along the shore. The Annual Beach Clean Up is still being sponsored by my old troop at our local park, and I go to help out now as a Senior Girl Scout."

Meredith T., age 17
Mississippi Valley Girl Scout Council
Illinois

"I planned a science workshop for girls in third through sixth grade. I had women scientists present science through music, water, creative solutions, and Earth Matters! It allowed these girls to have a hands-on experience, while seeing professional women scientists in action!"



Gold Awards

Alicia

Pine to Prairie Girl Scout Council
North Dakota

"I started a recycling program in our community. I started the program because our community did not have a recycling program and there was a need for recycling. I learned that it takes a lot of work to get recycling going. We wrote a grant, met with city board members, and did a lot of paperwork. Most of all, I know I did something good for my community, and it will continue now that I have finished it. The whole community and our environment benefited from this project. It was worth all the work."

Serina, age 16

Girl Scout Council of Hawaii
Hawaii

"My Gold Project, entitled "Math = Fun + Logic," was a weekend workshop for 4th-7th grade girls. It is in this time period that girls may experience difficulty while learning math, and that they then give up on ever learning it. My project was to show the girls, through untraditional math problems, that they can be good at it, or at least be able to use math. I showed them that math is not only numbers and computations, it also is logic, sequence, pattern, connection, etc. Arithmetic is what most girls have trouble with, not the other math subjects and arithmetic can only be improved through practice.

"At the workshop, I had the girls cook a meal with conversions and ratio, do string designs, learn magic tricks explained through math, and just become comfortable with their own individual math strengths and weaknesses. The favorite activities were a human checkers game (strategy and order) and a burning of our "math fears." I later presented each girl with a necklace containing the ashes of her fears to remind her that if she puts her mind to it, she can do anything—even math!"

Sarah, age 18

Morris Area Girl Scout Council
New Jersey

"For my Gold Award project, I created a science program for first through third graders to introduce them to the idea that anyone can have fun with science. I chose the project because I have been interested in science since I was a young girl. I learned a lot about my own skills with people, especially children."



Gold and Silver Project Ideas

Even if your Gold Award project is not related to science, you can still incorporate skills you develop through Interest Projects in the "Nature, Science and Health" category into your project. Take a look at some of these ideas gathered from different web sites for Girl Scout Cadette/Senior troops across the country:

- Create an interpretive map for a self-guided historical walking tour around your community, using math and mapping skills.
- Present a series of games and workshops utilizing sensory experiences to show girls first-hand what it's like to be disabled.
- Involve your community in an effort to clean up a polluted area, such as a lake or stream. You can also organize a community effort to clean up and improve facilities at a local park or nature center.
- Develop a web page for your school, troop or Council, or assist in maintaining an existing one.
- Plan and implement a recycling program in your school. Get people involved through an educational campaign, teaching people about environmentalism and the benefits of recycling. Arrange for the program to be continued after you graduate.
- Repair a troop house, making sure it complies with Safety Wise standards. Build a wheelchair ramp, if the house doesn't already have one, and make other improvements to ensure the house is accessible to all.
- Create a landscaping project for your school or Council. Consult with a landscape architect, if possible, to learn more about irrigation, maintenance, design and other aspects of the project.
- Conduct stargazing workshops for younger girls, teaching them about constellations and astronomy. Volunteer at a local observatory to learn more.
- If you are interested in the arts, you can write and produce a play that touches upon such themes as environmentalism, space exploration, modern technology or another topic related to science or nature.
- Develop and distribute science activity kits, with instructions and materials, for children who are hospitalized with extended care needs.
- Work with a local historical society and/or extension service to create a native plants education program. Develop a resource binder with reference information for the project.



Space Exploration Activity Survey

Approximately how long did you spend on each of the following activities?

Pop Rockets _____ minutes

Starlight, Starbright _____ minutes

Lasers, Light, and Lenses _____ minutes

The International Space Station _____ minutes

Next Stop Mars _____ minutes

What activity did you enjoy most, and why?

What activity did you like the least, and why?

Did you further explore any of the activities?

Which ones?

Give an example of what you did.

What can be done to make these activities more fun and/or successful?

Thank you for your help and your opinions!!!

Please return all forms to: