

S.T.E.A.M. Explorers

Monthly Patch Program



Dive into the world of S.T.E.A.M. with GSCI!

Each month will contain both research and activities which will need to be completed to earn the patch.

Ready to go ALL IN? Order all your monthly patches at once!
The All-In order is \$35 and open from September 1st through October 15, 2024.

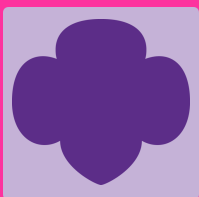
Individual patch registrations are open from the 1st of the month to the 15th of the following month (Ex: November Monthly patch registration will be open November 1st through December 15th). Each patch is custom designed and will be mailed out roughly 8-10 weeks after the order is due. Individual patches are \$3.50 each.

For more information, contact Tiffany Kaufmann at tkaufmann@girlscouts-gsci.org or Customer Care at 888-623-1237.

*Earn
these
patches!*



girl scouts
of central illinois



S.T.E.A.M. Explorers

Instructions

Dive into the world of S.T.E.A.M. with GSCI! Every month you will discover more about Science, Technology, Engineering, Art, and Math, connect with a woman of your choosing in that field of study, and take action through various activities and projects.

Discover

With this section, you will read about and discover more about the monthly subject. Feel free to do more extensive research on your own!

Connect

Choose a famous woman in that month's field of study. If you need help choosing one, you will find some listed at the bottom of the Discover page. Then answer the questions provided about her life and her work.

Take Action

Complete 4 out of the 8 activities provided to get a more hands-on experience with each field of STEAM. Included are projects, prompts, experiments, and practical applications within the scope of the monthly subject. You will find links to the activities at the end of this booklet!

S.T.E.A.M. Explorers Schedule

September: Earth Science	October: Cybersecurity	November: Engineering	December: Fashion
January: Geometry	February: Biology	March: Programming	April: Robotics
May: Music	June: Economics	July: Astronomy	August: Painting



S.T.E.A.M. Explorers

September

Earth Science

Discover

Earth Science is study of planet Earth. It covers everything from the deep inner core to the outer layers of the atmosphere. There are many fields of science that are part of Earth Science including geology (rocks and minerals), paleontology (dinosaurs and fossils), meteorology (atmosphere and weather), and oceanography (oceans), just to name a few.

Some careers you can have within the field of Earth Science are Geologist, Meteorologist, Oceanographer, Seismologist, and Environmental Scientist. From rocks to weather systems to the oceans to tectonic plates and everything in between, Earth Science covers it all.

There are 4 “spheres” that Earth Science is divided into:

- Atmosphere– the air around the Earth that is made up of different gasses and forms a protective layer around it
- Biosphere– where life exists, includes all biomes and ecosystems
- Hydrosphere– the areas of Earth covered by water (75% of the Earth is covered by the oceans)
- Lithosphere– the outer layer of the Earth including the crust, and part of the mantle

Famous women in Earth Sciences: Mary Anning, Rachael Carson, Alice Ball, Barbara McClintock, Jane Goodall, Elizabeth Carne, Etheldred Benett, Margaret McArthur, Mary Leakey, Marjorie Korringa, Kayla Iacovino, Wangari Maathai, Vandana Shiva, Marjory Stoneman Douglas, Sylvia Earle, Julia Hill, Inge Lehmann



S.T.E.A.M. Explorers

September

Earth Science

Connect

Woman's Name: _____

Born: _____

Where: _____

Died: _____

Where: _____

When did they start becoming interested in this subject? _____

What are they most known for? _____

What were some notable things they did in their field? _____

Any famous quotes? _____



S.T.E.A.M. Explorers

September

Earth Science

Take Action

Complete four of the following:

1. Watch a video about the Water Cycle and then create a model either by drawing it out or making one in real life.
2. For a week or two, keep a weather journal. Make sure you keep track of the daily temperature highs and lows, what the weather was like that day, and what the windspeed was for the day.
3. Make edible rocks! You can either follow a recipe to make rock candy or you can create the 3 types of rocks using grated chocolate (milk and white), crushed cookies, and a cupcake tray with liners.
 - Sedimentary- layer the chocolate and crushed cookies in the cupcake tray and then use a small sheet of aluminum foil to press down hard and compact the chocolate together.
 - Igneous- melt the chocolate down (add in cookies if you wish)
 - Metamorphic- combine your other two type of rocks! And melt them together, then compress them into each other.
4. Using a plastic bottle, cotton balls, sand, gravel, and other natural items, filter some muddy water and try to make it clear again. Do not drink it!
5. Do you know what vinegar can do to bones? Test it out on some chicken bones leftover from dinner!
6. Create your own salt dough fossils with just 2 cups of flour, 1 cup of salt, and 1/2 cup of warm water. Then take some shells, plastic dinos, or whatever else you can find and make your own fossils!
7. Learn more about the layers of the Earth and how sediment forms with this sediment jar experiment! All you need is various types of dirt, soil, plant matter, sand, water, etc. and a large clear jar with a lid. Fill the jar 3/4 of the way with water and add your materials. Shake it up! Set it in a sunny spot and watch the layers start to form.
8. Create a Disaster Supply Kit for yourself and your family members. Having these prepared as a 72 hour grab and go pack in case of an emergency like a tornado, flood, hurricane, or earthquake can be extremely helpful. The most important thing to have is drinking water!



S.T.E.A.M. Explorers

October

Cybersecurity

Discover

Cybersecurity is the set of practices, tools, and techniques that are used to keep you safe from harm when you're online. Almost every kid has a device, which makes instilling proper cybersecurity awareness and practices that much more important.

Some tools of Cybersecurity are antivirus software installed on a computer, learning more about being cautious about clicking links online, and establishing strong passwords for your online accounts. Strong passwords should have at least 8 characters and use a combination of letters, numbers, and symbols. Passwords should not be shared with anyone.

Learning more about Cyber bullying, Phishing Scams, and Malware can help children, and even adults, stay safe online. Cyber bullying is a form of online harassment that can include text messages, pictures, or the spread of misinformation. Phishing scams can be used to unintentionally give out confidential information and can lead to eventual malware injection onto devices. Malware stands for malicious software and they are files that are unknowingly downloaded onto devices and are intended to harm the user in some form.

Famous Women in Cybersecurity: Nicole Eagan, Chani Simms, Jaya Baloo, Marnie Wilking, Parisa Tabriz, Jadee Hanson, Rae Kelly, Katie Moussouris, Kirsten Davies, Lakshmi Hanspal, Michelle Drolet, Rebecca Bace, Summer Craze Fowler, Alissa Abdullah, Deneen Defiore



S.T.E.A.M. Explorers

October

Cybersecurity

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What are they most known for? _____

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Any famous quotes? _____



S.T.E.A.M. Explorers

October Cybersecurity

Take Action

Complete four of the following:

1. Read and sign GSUSA's internet safety agreement.
2. Watch this 7 minute video about cybersecurity: <https://youtu.be/>. See the resources page for videos for a younger audience. Did you learn anything new?
3. Create a "circle of trust" containing you, your family, friends, authority figures, and acquaintances.
4. Make your own super secure password. Remember to make it at least 8 characters and use a variety of letters (both lowercase and capital), numbers, and symbols.
5. Write a short paragraph about why cybersecurity is important.
6. AI, or artificial intelligence, is a hot topic right now. With cybersecurity it is currently being used to detect phishing and malware, as well as automatically responding to those attacks to prevent the most damage. Even the CISA (Cybersecurity & Infrastructure Security Agency) is establishing a plan to use AI to protect Americans. Learn more about this plan and talk with your family or troop members about why this is helpful or not.
7. Talk to a professional about cybersecurity.
8. Work on earning your cybersecurity badges. Complete at least 3 steps throughout all 3 badges. See the resources page for a link to the badge booklets.



S.T.E.A.M. Explorers

November Engineering

Discover

Engineering is the designing and building of complex products, machines, systems, and structures. Basically it is how and why things work.

There are 4 main branches of engineering:

- Civil– designs of major transportation projects
- Electrical– designs using electricity
- Mechanical– designs of power-producing machines
- Chemical– designs like gasoline, detergents, and medicine

Many types of engineering must be performed to design and build a complicated system. The engineering design process is a series of steps that engineers use to guide them as they solve problems. During the process, engineers:

- Identify the problem or challenge.
- Identify design requirements and limitations on the design due to available resources and the environment.
- Brainstorm possible solutions to the problem or challenge.
- Generate ideas and develop the most promising ones.
- Explore possibilities and the pros and cons of each.
- Select an approach by identifying the design that appears to solve the problem best.
- Build a model or prototype.
- Refine the design by identifying changes that need to be made and improving the model or prototype.

Famous Women in Engineering: Emily Warren Roebling, Lillian Moller Gilbreth, Mae C. Jemison, Mary Jackson, Elsie Eaves, Kate Gleason, Beatrice Hicks, Evelyn Wang, Barbara Liskov, Katharine Parsons, Yvonne Clark, Lisa Su, Henrietta Vansittart, Debbie Sterling



S.T.E.A.M. Explorers

November

Engineering

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When did they start becoming interested in this subject? _____

What are they most known for? _____

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Any famous quotes? _____



S.T.E.A.M. Explorers

November Engineering

Take Action

Complete four of the following:

1. Design and build a bridge. You can use whatever materials you would like to make your bridge out of. Then test it out by seeing how much weight it can hold like a real-life bridge.
2. Take a virtual tour of a landmark bridge like the Brooklyn Bridge, Golden Gate Bridge, or the London Bridge. What did the virtual tour show you? Would you ever want to visit this bridge in real-life?
3. Create a paper plane. Test out how far your paper plane can fly and measure the distance. Compete with your family or friends to see who can build the best paper plane.
4. Try your hand at building your own simple machine (pulley, level, wedge, etc.). What materials do you need? How are these simple machines similar and different? What are these simple machines used for?
5. Design and build your own marble run or Rube Goldberg machine. Using supplies found in your house challenge yourself you see how long you can design it to last.
6. Give the Egg Drop Challenge a try! Build a structure around an egg, or for an egg to be placed in, and see if your structure will protect your egg from a high fall. Do this challenge with your family or friends and see who can build the best egg-protecting structure!
7. Create a dome or other structure using only marshmallows (or gum drops) and toothpicks! For an even greater challenge, test it against strong winds (like a hair dryer) to see if your structure will stand up to natural weather occurrences.
8. Speak with a local engineer, mechanic, or pilot. Ask them what they do for their job and how they became interested in their field.



S.T.E.A.M. Explorers

December Fashion

Discover

Fashion involves the styles that are popular in any given time and place, most often talking about clothing. Fashion can also include hairstyles, household decorations, and automobiles, but for this patch we will mainly be covering clothing and accessories.

Fashion can influence many different people in many different ways. Some, especially those who are constantly in the public eye, spend a lot of time and money on what they look like and what they wear. Others may not be bothered worrying about fashion and only focus on what they can afford or what they like.

This industry is constantly changing, but not always at the same speed consistently. Manufacturers welcome change because it creates a demand for new products. It is not un-common for things to go in and out of fashion; bell-bottom pants, bean bag chairs, and longer hair on men are just a few examples.

Fashion shows, the media, and celebrities influence what is trending currently. Average people cannot afford what is seen at fashion shows but designers can sell their ideas to manufacturers who make cheaper versions to sell to the general public. Many fashion magazines are published so people can keep up with fashion trends. However, celebrities may have the most influence as a lot of the general public may look up to their favorite celebrities.

Famous Women in Fashion: Coco Chanel, Donatella Versace, Vera Wang, Miuccia Prada, Stella McCartney, Diane von Furstenberg, Elsa Schiaparelli, Anna Wintour, Rei Kawakubo, Vivienne Westwood, Carolina Herrera, Betsey Johnson, Madeleine Vionnet, Anne Klein



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S.T.E.A.M. Explorers

December Fashion

Take Action

Complete four of the following:

1. Learn 2 sewing techniques. Some examples include:
 - Running stitch
 - Overstitch
 - Backstitch
 - Blanket Stitch
 - French Knot
2. Create a vision board for your preferred style. Take images from magazines or print off some images from the internet that show what styles, colors, and items you like.
3. Design your own article of clothing. Find a template online and either draw and color your own design or use fabric scraps and glue them together on your paper model.
4. “Tour” a craft store that has a fabric department. Ask an employee, if they are not busy, about different tools and fabrics that are most used by customers. You can also think of different questions to ask before you go and see if the employees can answer them for you. Please remember to be respectful when asking any questions.
5. Learn how to take measurements on yourself. All you’ll need is a measuring tape or string, a pen, and paper. (see the link on the resources page!)
6. Create an outfit for a doll or stuffed animal. Try out some of the stitches you’ve learned or DIY something from already sewn together materials such as a headband or sock.
7. Go to a store that sells clothing and style an outfit for yourself, a friend, or a family member. If you style a friend or family member, have them tell you what they think about their new outfit.
8. Watch a video of a high fashion runway show. Then pretend you are a fashion critic and write an article about what you thought about the designs and the show presentation. Remember that this is high fashion so the designs and presentation may be a little more “extra” than you are used to, so go into it with an open mind. You are also choosing which runway you watch and write about so make sure you find one that you think you’ll enjoy!



S.T.E.A.M. Explorers

January

Geometry

Discover

Geometry is a branch of mathematics that deals with shapes and figures. This branch explains how to build or draw shapes, measure them, and compare them. People use geometry in many kinds of work, like building houses and bridges, and even planning travel in space.

Basic geometry terms:

- Point– an object that has no length or width
- Line– an object that extends without end in both directions
 - Line segment– a part of a line with 2 end points
 - Rays– half of a line with one end point
- Angle– 2 rays with the same end point, measured in degrees
- Polygon– a closed figure formed by joining together line segments
- Circle– a shape that has curves instead of straight lines
 - Radius– the distance from the edge to the center
 - Diameter– the distance across the circle, 2x the radius
 - Circumference– the length around the outside of the circle
- Solid Figures– 3-D shapes like cubes, spheres, and cones

Famous Women in Geometry: Sophie Germain, Maryam Mirzakhani, Karen Uhlenbeck, Sofia Vasilyevna Kovalevskaya, Alicia Boole Stott, Nancy Hingston, Diane MacLagan, Eva Miranda, Déborah Oliveros, Nelli Neumann, Marjorie Rice, Katalin Vesztegombi, Maryna Viazovska, Anna Wienhard



S.T.E.A.M. Explorers

January

Geometry

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S.T.E.A.M. Explorers

January

Geometry

Take Action

Complete four of the following:

1. Tangrams are a Chinese geometric puzzle consisting of a square cut into seven pieces that can be arranged to make various other shapes. Cut out your own tangram shapes from the link on the resources page and see how many animals you can create.
2. Explore 3D shapes by making 3D nets. Nets are what 3D shapes would look like laid flat in a 2D shape. You'll need paper, a glue stick, a way to poke small holes in paper, string, and scissors.
3. Build and play with Legos or other similar blocks. What 2-D and 3-D shapes can you make? Which ones can you not make? Try to make as many shapes as possible.
4. Participate in a shape scavenger hunt in nature! Choose which shapes you would like to look for and then go on a hike either in your neighborhood or at a local park. What shapes can be found in nature?
5. Create your own geometric art! Use whatever shapes you can think of to create an amazing work of art. Or check out the resources page for a circle specific one. You only need a compass (or a circle to trace), a pencil, eraser, and markers.
6. Work on earning your level's Shapes in Nature badge. Complete at least two steps from the badge. If you are a Cadette and up, do at least one activity from each level's badge.
7. What is a prism? What does it create with light? See if you can find a prism around your house and have natural light shine through it. What other things can you find that also act like a prism?
8. Did you know that when you play with a Spirograph, you are actually doing some very complicated geometry? Spirographs use a detailed math in order to make a cool looking design! Try out a spirograph for yourself and then see if you can figure out why different shapes and sizes of cogs and pen-holes make so many different designs.



S.T.E.A.M. Explorers

February Biology

Discover

Biology is the study of living things. These things include plants, animals, fungi, protozoa, algae, bacteria, and viruses. Scientists who study biology are called biologists.

There are many different areas of biology, since there are many kinds of living things. Biologists could choose to study anatomy, which is the structure of living things, or ecology, which is the study of how organisms interact with their environment. Some branches study certain types of living things, like zoology (animals), botany (plants), entomology (insects), and mycology (fungi).

Biology subjects:

- Cells
- The Human Body
- Nutrition
- Genetics
- Plants
- Living Organisms
- Disease

Famous Women in Biology: Jane Goodall, Jeannette Villepreux Power, Barbara McClintock, Alice Ball, Chien-Shiung Wu, Dame Miriam Lousia Rothschild, Rachel Carson, Joan Murrell Owens, Maria Sibylla Merian, Dorothy Crowfoot Hodgkin, Rosalind Franklin, Helen Gwynn Vaughan, Marie Maynard Daly, Jennifer Doudna, Rita Levi-Montalcini



S.T.E.A.M. Explorers

February

Biology

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Any famous quotes? _____



S.T.E.A.M. Explorers

February Biology

Take Action

Complete four of the following:

1. Fingerprints are unique to everyone and forensic scientists use fingerprints as clues to figure out who was part of a mystery. Using a balloon (light colors work best) and a washable ink pad (black works best) check out what your fingerprint looks like and identify what kind you have. Have your friends or family do it too and compare your fingerprints.
2. Try to germinate a seed! Find any seed you would like to grow and place it on a damp paper towel in a plastic baggie. Try to guess what will happen and then watch your seed sprout and grow! Once it's sprouted, you can plant it if you have permission.
3. Make a candy model of a DNA strand or an edible cell. For the DNA model, you'll only need Twizzlers and gummy bears/gumdrops. The cell model does need more items, but they are mostly things you might already have in your house.
4. There are many different experiments to learn about surface tension. Find one that you like and/or have the supplies for and try it out. Why does the liquid behave like that? What in biology uses surface tension?
5. Try making your own homemade bread. For a simple recipe, all you'll need is warm water, sugar, active dry yeast, vegetable oil, salt, and bread flour, but you can always find your own recipe if you want something different. Use the link on the resources page to learn about the biology of bread while it bakes.
6. Learn a bit about Botany by dissecting a flower. You can purchase a flower from a local flower shop or see if you can find one growing outside. Then take apart the flower a label what parts you find.
7. Discover what happens to an egg when it's put in vinegar. Make it even more fun by creating a rainbow of interesting eggs.
8. Explore different animal habitats. Pick any animal, learn about their habitat, and do an experiment or project exploring that habitat. What did you learn about that animal? How do they live? What does their habitat tell us about the animal?



S.T.E.A.M. Explorers

March

Programming

Discover

Programming, or coding, is a way for humans to communicate with computers by writing instructions for them to follow. These instructions are not written in English like you write yourself, but rather in a language that the computers will understand.

Technology is a part of every day life now, so understanding coding allows anyone to go past only knowing how to use technology. Coding is important for children because it teaches them problem-solving skills, critical thinking, perseverance, communication, and allows them to be creative in their thinking.

Common programming languages:

- JavaScript– used for web and game development, mobile apps and building web servers
- Python– used for back end development in machines, data science, app development
- HTML– used for web documents, website developments and maintenance
- CSS– also known as cascading style sheets, usually used with HTML for a website's appearance
- C#- used for game development, desktop/web/mobile apps, and VR

Famous Women in Programming: Kimberly Bryant, Ada Lovelace, Grace Hopper, Radia Perlman, Katherine Johnson, Adele Goldberg, Margaret Hamilton, Carol Shaw, Mary Kenneth Keller, Annie Easley, Karen Spärck Jones, Shafrira Goldwasser, The ENIAC Programmers, Joan Clark



S.T.E.A.M. Explorers

March

Programming

Connect

Woman's Name: _____

Born: _____

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When did they start becoming interested in this subject? _____

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Any famous quotes? _____



S.T.E.A.M. Explorers

March

Programming

Take Action

Complete four of the following:

1. Create binary code friendship bracelets. Using 3 different colors write out your name or whatever phrase you would like on your bracelet. Color 1 is for 0's, color 2 is for 1's, and color 3 is to show a space between letters.
2. Using a plate or piece of cardboard, straws, glue, and a marble, create your own maze. See if you can guide your marble from one end of the maze to the other. You can make it as easy or as difficult as you want.
3. Create an app on paper based on what you think people need or what they will use in day-to-day life. Research to see if this is already an app someone has made. If it is not, research how app developers create apps.
4. Create a free Scratch account and complete a free activity on their website.
5. Learn about coding with Legos (or similar blocks). Start by sorting out your blocks into color categories. Then have your blocks repeat patterns, simple or complex (ABAB, ABACABAC, etc.). Using those patterns, assign meanings to each different patterns (ex. Letters). Then you can create your own code using whatever you'd like.
6. Watch this video about programming: <https://youtu.be/>. Afterwards, discuss with your family, friends, or troop members how programming is used in our world today and what it effects around us.
7. Work on earning your Coding for Good Badges. Complete at least one step from each of the three badges or complete one of the badges fully.
8. Create art by using bitmap. Similar to the way Minecraft looks, bitmap is the process of coloring pixel by pixel in a square of space (see the image below). The easiest way to do this is by using graph paper, but feel free to do it by hand or color in a coloring page using only dots (like artist Georges Seurat).

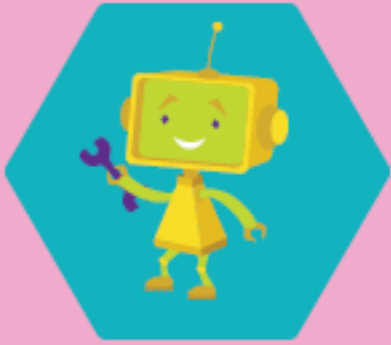
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0	000000	Black
1	FF0000	Red
2	00FF00	Green
3	0000FF	Blue
4	FFFFFF	White
5	FFFF00	Yellow
6	FF00FF	Magenta
7	00FFFF	Cyan
8	FF0080	Dark Magenta
9	FF8040	Dark Orange
A	804000	Dark Brown
B	008080	Teal
C	800000	Dark Red
D	800080	Dark Purple
E	8080FF	Dark Blue



S.T.E.A.M. Explorers

April Robotics

Discover

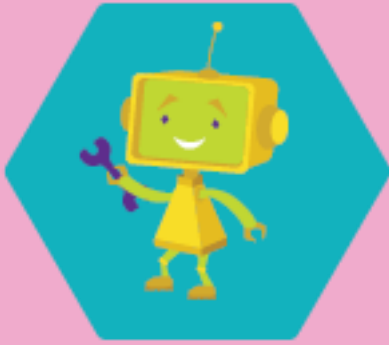
Robotics is the process of developing robots. Robots are machines that can think and act. They are programmed to listen to specific commands and react to them according to their programming.

Humanoids are robots that look and act like humans, however most robots do not look like people and can only do what they are built to do.

Robotics brings together both science and engineering to design, construct, and use the robots. Currently robots are used to replace humans in many industries where there were a lot of simple and repetitive tasks, like manufacturing where it may be slightly dangerous for humans.

There are many different types of robots in many different fields. Consumer robots may be ones you have in your home, like vacuums, robotic kits, and AI assistants (think Alexa or Siri). There are also Aerospace robots, drones, industrial robots, self-driving cars, and underwater robots. These many different types of robots all help with research or advancements within their designated field.

Famous Women in Robotics: Tessa Lau, Ayorkor Korsah, Cynthia Breazeal, Ayanna Howard, Linda Pouliot, Marita Cheng, Melonee Wise, Anjali Jaiprakash, Catherine Ball, Erin Rapacki, Ruzena Bajcsy, Kaijen Hsiao, Dr. Kimberly Hambuchen, Dr. Maja Matarić



S.T.E.A.M. Explorers

April

Robotics

Connect

Woman's Name: _____

Born: _____

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Died: _____

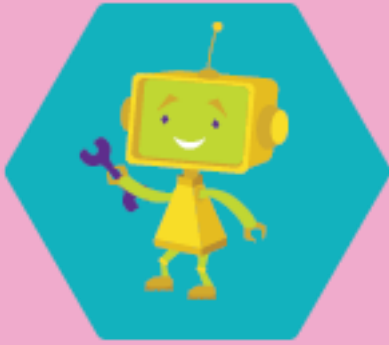
Where: _____

When did they start becoming interested in this subject? _____

What are they most known for? _____

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Any famous quotes? _____



S.T.E.A.M. Explorers

April Robotics

Take Action

Complete four of the following:

1. Apply the practical side of Robotics by making a “robotic” hand. Using straws, string, tape, cardstock, and scissors, create a “hand” that you can use to pick light things up.
2. Reach out to a local robotics team and ask them questions about their team. What they do during meets and how do their competitions work? Try to attend a competition and see it for yourself.
3. Learn about the Mars Rover. What did it do and why was it important? Using the website provided on the resources page, try out one of the activities.
4. On paper, design a robot with a purpose. What could you use a robot for in your life? Maybe you don’t like folding your laundry, so you need a laundry-folding robot. Draw a picture of your robot and include its name, what it does, and how it is helpful to you or someone else.
5. Work on earning your Robotics badges. Complete at least one step from each of the three badges or complete one of the badges fully.
6. Make a Scribble Bot! You will need to purchase a DC motor and a battery holder for this project, but otherwise you will need markers, a plastic cup, AA batteries, tape, hot glue, a counterweight, and fun decorations. Follow the steps at the link on the resources page.
7. Visit your local library and check out some books about robots. Non-fiction will be the best place to look for knowledge (around the 629.8 call number) but you can also ask your local librarian for fiction books about robots.
8. Build your own robot. Using the link on the resources page, try to build a spinning brushbot, a simple robot car, a propeller car, or a Wobblebot. You can also find any robotics kit at the store and build one of those robots as well.



S.T.E.A.M. Explorers

May Music

Discover

Music is a form of art that arranges sounds in a pleasing or meaningful way. Music can be simple, like a drum beat, or complex, like a full orchestra piece.

There are four main elements to music:

- Rhythm– the length of musical sounds
- Melody– a series of different sounds in a musical piece
- Harmony– playing more than one tone at the same time
- Form– how all three of these things are put together

There are also four main families of musical instruments:

- Percussion– drums, keyboards, cowbell, etc.
- Strings– Violins, Violas, harps, guitars, etc.
- Woodwinds– flutes, clarinets, saxophones, etc.
- Brass– trumpets, trombones, tubas, French horns, etc.

There are many different types, or genres, of music as well. Folk, Opera, Classical, Country, Jazz, Hip-Hop, Rap, Rock, and Pop are only a few that many people listen to every day.

Famous Women in Music: Elle Fitzgerald, Whitney Houston, Taylor Swift, Dolly Parton, Madonna, Beyoncé, Janis Joplin, Mariah Carey, Björk, Lana Del Rey, Shania Twain, Hildegard of Bingen, Barbara Strozzi, Marianna Martines, Fanny Mendelssohn, Clara Wieck Schumann, Ethel Smyth, Amy Beach, Florence Price, Lili Boulanger



S.T.E.A.M. Explorers

May Music

Connect

Woman's Name: _____

Born: _____

Where: _____

Died: _____

Where: _____

When did they start becoming interested in this subject? _____

What are they most known for? _____

What were some notable things they did in their field? _____

Any famous quotes? _____



S.T.E.A.M. Explorers

May Music

Take Action

Complete four of the following:

1. Have a dance party! Listen to music and play a dancing game. Examples: Musical Statues, Mirror game, musical chairs, Hot Potato, etc.
2. Learn about musical instruments and what they sound like. Then test your knowledge by listening to the sounds with your eyes closed and see how many you can correctly identify.
3. Music makes everyone feel something differently. Listen to a piece of music with your eyes closed in a comfortable position. Ask yourself how does it make you feel, what pictures or colors come to mind, and what does it remind you of. Then draw a picture or create art based on how the music made you feel.
4. Pick 3 genres of music and listen to at least 30 minutes of each genre. Compare the similarities and differences between the genres. Discuss with your family, friends, or troop members what you discovered.
5. Build your own musical instrument. You can make maracas, drums, chimes, a guitar, a horn, or even a harmonica.
6. Write a short paragraph about why music is important. How does it help people emotionally, socially, and educationally?
7. Write and/or compose your own song. You can choose to do just lyrics, just music, or both! If you feel comfortable, perform it for someone.
8. Reach out to a local musician. This can be a singer, soloist, band, or orchestra. Ask them why they like performing music and how they got started.



S.T.E.A.M. Explorers

June

Economics

Discover

Economics is the study of the economy, or the part of society that creates wealth. Wealth is not just money, but also the production of goods and services, which people buy with money. People who study the economy are called economists. They look at how people create wealth, how that wealth is used, and also how different people get different amounts of wealth.

There are several branches of economics, but the two main categories are microeconomics and macroeconomics. Microeconomics takes a look at how consumers spend their money, why people buy one item over another, and the concept of supply and demand. Macroeconomics takes a look at the value of all the goods and service a country produces, how the government plays a role in its country's economy, and economic growth (how a nation's wealth becomes larger).

The process of creating goods and services is called production. There are 3 major factors in production: land, labor, and capital. Land can be a large piece of land or a tiny workshop but it can also be natural resources. Labor is the people who work for pay. Capital is the tools, factories, and offices used to make the goods and services. Money is not a factor, but it is the means by which companies pay for production.

Famous Women in Economics: Susan Athey, Edith Abbot, Alice Rivlin, Anna Schwartz, Deirdre McCloskey, Carmen Reinhart, Harriet Martineau, Joan Robinson, Janet Yellen, Mary Paley Marshall, Christina Romer, Rosa Luxemburg, Elinor Ostrom, Millicent Fawcett



S.T.E.A.M. Explorers

June

Economics

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S.T.E.A.M. Explorers

June

Economics

Take Action

Complete four of the following:

1. With permission from a parent or guardian, open a savings account at your local bank. Try to set a goal for how much money you would like to deposit monthly and eventually how much you would like to save up in total.
2. Visit your local grocery store with a set budget. Plan out what you need to purchase and what you would like to purchase. Compare different brands pricing as well as the cost savings for buying in bulk.
3. Write down what you consume for a week. This includes not only the food you eat, but also the clothes you wear, the things you use throughout the day, if you travel anywhere the gas that is used, and anything else you touch. Try to be conscientious about the things you consume. Discuss with your family about the different things you wrote down and where they came from and how they may have been made.
4. Look around your house for a variety of things. Look up where they were produced, grown, or manufactured. Find the locations on a map and figure out which of your items travelled the furthest. Research how what people consume influences the economy and environment.
5. Learn about the Stock Market. Pick 3 companies and pretend to invest money into them by buying stock. After 3 weeks, check on your companies to see if you made money or lost money. Use the link on the resources page for online versions.
6. Design your own Save, Spend, and Donate jars. These will help you learn how to budget money and how to decide what to use your money towards.
7. With your family, friends, or troop members, play a game of Monopoly. Discuss with them why the game was created and what it teaches you when you play.
8. Watch this video about economics: <https://youtu.be/> What was something new that you learned? Do you have a better understanding of what economics is? How can you continue to use what you've learned in your day-to-day life?



S.T.E.A.M. Explorers

July

Astronomy

Discover

Astronomy, one of the oldest sciences in the world, is the study of all objects outside of the Earth's atmosphere. This includes the Sun, Moon, stars, planets, and galaxies. People who study astronomy are called astronomers and have studied these objects for thousands of years.

Galaxies contain most of the universe's objects, like stars, gasses, dust, and planets. Our planet, Earth, is located in the Milky Way Galaxy. In our galaxy, the Earth and other planets revolve around the Sun, which is our biggest star, while satellites or moons revolve around the planets. All of those bodies together make up our solar system.

Thousands of years ago, there were no calendars or clocks so people kept track of time by watching the Sun and the stars. It was important for them to know the time in order to plant and harvest their crops. These people were the first astronomers. An ancient astronomer developed the idea that Earth occupies the center of the universe and other objects revolve around it, but that theory was later challenged in 1543 by Copernicus who developed the theory that has proven to be true today, that the planets revolve around the Sun.

Famous Women in Astronomy: Caroline Herschel, Cecilia Payne-Gaposchkin, Katherine Freese, Sara Seager, Vera Rubin, Henrietta Swan Leavitt, Annie Jump Cannon, Nancy Roman, Andrea M. Ghez, Maria Mitchell, Barbara A. Williams, Beth A. Brown, Ye Shuhua, Sultana N. Nahar, Caroline Shoemaker, Carolyn Porco



S.T.E.A.M. Explorers

July

Astronomy

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Any famous quotes? _____



S.T.E.A.M. Explorers

July

Astronomy

Take Action

Complete four of the following:

1. Visit a local space museum or planetarium. See if you can discover something new! If they have special activities happening when you visit, participate in them.
2. Learn about the phases of the moon with Oreos! By using the stuffing as the moon we see from Earth, shape the different phases on each frosted side of the cookies that you split apart.
3. Last year we witnessed a solar eclipse. See if you can find videos online of both solar and lunar eclipses. What is the difference between the two eclipses? Do they look different from each other? Which one is more common?
4. Learn about the constellations we typically see in our sky. Go out on a clear night and find some of them in the sky! Which 5 constellations are the ones we can see all year long? From the ones you chose to learn about, which is your favorite? Read some of the stories based on the constellations and see if you can come up with your own story.
5. Work on earning your level's Space Science badge. Complete at least two steps from the badge.
6. Using flour and rocks or marbles, learn how craters are made on the moon. Discuss the science behind how they are made and why impacts on the moon are different from those on Earth.
7. Watch a video about a moon landing. Discuss with family, friends, or troop members why it was important during the time it happened and how you think it impacted the people who witnessed it for the first time. What made it special and what was the public's reaction to it?
8. Visit the NASA website for kids (linked in the resources page) and try out one of the activities they provide.



S.T.E.A.M. Explorers

August Painting

Discover

Painting is the art of creating pictures using colors, tones, shapes, lines, and textures. People of all ages can be painters by using a variety of different materials. Experienced artists may use oil or acrylic paints on canvas, young painters may use watercolors on paper, and very young children may use finger paints. Painting is for everyone and can be used as a form of entertainment or creative expression.

All paintings have a subject, whether it is something as simple as an animal or a bowl of fruit or as complex as landscapes or feelings. Painters can create portraits of people they know or even themselves, but portraits portray the human figure in some way. Still-life paintings include landscapes, ideas, or any other motion-less objects.

Humans have been making paintings for thousands of years. Paintings have been found on the walls of caves in France and Spain dating back 15,000 years. In the Middle Ages, miniature paintings were created to illustrate written texts in Europe and watercolor and ink paintings on long scrolls of paper or silk were a tradition in China and Japan. The Renaissance took place between the 1300's and the 1500's in Europe. Artists began creating more realistic pictures and introduced bold ideas. Other styles of art include Baroque, Rococo, Neoclassicism, Romanticism, Realism, Impressionism, and Modern Art.

Famous Women in Painting: Mary Cassatt, Hilma af Klint, Georgia O'Keeffe, Frida Kahlo, Mickalene Thomas, Elaine Sturtevant, Helen Frankenthaler, Élisabeth Louise Vigée Le Brun, Grandma Moses, Joan Mitchell, Artemesia Gentileschi, Elaine de Kooning, Berthe Morisot



S.T.E.A.M. Explorers

August Painting

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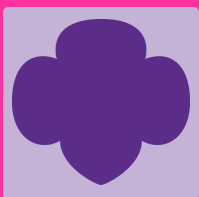
S.T.E.A.M. Explorers

August Painting

Take Action

Complete four of the following:

1. Create your own watercolor paints by adding food coloring to bubbles. Then create your own artwork by blowing those colored bubbles onto paper.
2. "Pour Painting" has become popular in recent years. This is the act of pouring various colors of acrylic paints in random patterns and letting them dry without touching them with a brush. Sometimes the paints are diluted with a solution to make them flow easier, but that isn't always necessary. Create your own pour paint art, either on canvas or a 3D object like a flower pot or vase.
3. Spin art is another fun way to create a unique piece of art. There are machines that can be used for this, but if you do not have access to a machine, you can create this art in a similar way as pour painting. Drop paint on a canvas wherever you would like and then throw it (preferably outside) like a frisbee. This secondary way is a little more chaotic and less uniform than a typical spin art machine, but it works just as well.
4. Visit a craft store and look at the variety of brushes, paints, and canvases. If an associate has time, see if you can ask them questions about the various uses for everything you found.
5. With permission from an adult, collect items around your house to use to paint any subject. You can also use items from nature like pine needles, leaves, sticks, and rocks.
6. Painting rocks is another fun activity that has become popular recently. Many people paint unique rocks and hide them in their neighborhoods for others to find and enjoy. Paint your own rocks and join in on the fun!
7. Speak with a local artist or visit a local art show or museum. If you speak with an artist, ask them what they like about creating art, how they got started, and what their favorite thing to create is.
8. Find 3 art styles that you enjoy looking at. Compare their similarities and differences. What do you like about each style? What makes them each unique? Do you think you could create something similar? Why or why not?



S.T.E.A.M. Explorers

Resources

September Take Action:

1. <https://lessons4littleones.com/2015/04/15/water-cycle-rain-cycle-science-experiments/>
2. <https://theaverageteacher.com/weather-journals-for-students/>
3. <https://www.science-sparks.com/edible-rocks-rock-investigation/>
4. <https://www.generationgenius.com/activities/water-quality-and-distribution-activity-for-kids/>
5. <https://www.kids-earth-science.com/cool-science-experiments>
6. <https://www.makelifelovely.com/diy-dinosaur-fossils-with-salt-dough/>
7. <https://raisinglifelonglearners.com/sediment-jar/>
8. <https://cherish365.com/how-we-are-preparing-for-disasters/>

October Take Action:

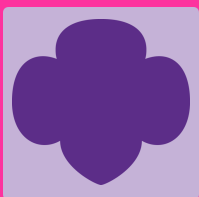
1. <https://www.getyourgirlpower.org/InternetSafetyPledge.pdf>
2. For a more “kid-based” video, watch these: <https://youtu.be/> and <https://youtu.be/>
3. <https://www.do2learn.com/organizationtools/SocialSkillsToolbox/RelationshipTarget.htm>
4. <https://www.mamalatinatips.com/2019/02/a-safer-internet-for-families.html>
6. <https://www.cisa.gov/ai>
8. <https://drive.google.com/drive/folders/>

November Take Action:

1. <https://teachersareterrific.com/2023/12/tips-for-building-bridges-in-stem.html>
2. Brooklyn bridge: <https://www.iloveny360.com/panorama/brooklyn-bridge> , Golden Gate Bridge: <https://youtu.be/>, London Bridge: <https://www.londonbridgetour.com/virtual-tours/>
3. <https://everydaychaosandcalm.com/best-paper-airplane-design/>
4. <https://stemeducationguide.com/simple-machine-projects/>
5. Marble Run: <https://frugalfun4kids.com/best-marble-runs-for-kids-to-build/> Rube Goldberg machine: <https://tinkerlab.com/engineering-kids-rube-goldberg-machine/>
6. <https://buggyandbuddy.com/stem-kids-egg-drop-project/>
7. <https://www.learnwithplayathome.com/mini-marshmallow-and-toothpick-building>

December Take Action:

1. <https://www.redtedart.com/basic-hand-stitches-beginners/>
2. <https://cherish365.com/vision-boards-for-kids-help-children-follow-dreams/>
3. <https://krokotak.com/2017/05/fashion-design-craft-project/>
5. <https://thefoldline.com/2018/12/08/the-sewing-pattern-tutorials-9-measuring-yourself/>
6. <https://livinghappydays.com/create-barbie-doll-clothes/>



S.T.E.A.M. Explorers

Resources

January Take Action:

1. <https://byjus.com/maths/tangram/>
2. <https://www.steampoweredfamily.com/3d-nets-geometry/>
4. <https://mightykidsacademy.com/outdoor-scamenger-hunt-for-kids-recognize-shapes/>
5. <https://teachbesideme.com/geometric-math-art-circles/>
6. <https://drive.google.com/drive/folders/1qtwlmF4J0rVl-PxcggX4EnDC2kdpLYI7?usp=sharing>
7. <https://www.mathsisfun.com/geometry/prisms.html> and <https://buggyandbuddy.com/rainbow-science-for-kids-exploring-prisms/>
8. <https://aperiodical.com/2021/12/the-mathematics-of-spirograph/>

February Take Action:

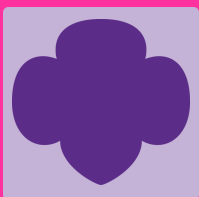
1. <https://experience.girlguides.ca/node/43006>
2. <https://lifeovercs.com/germinating-seeds-bag-science-experiment-kids/>
3. DNA: <https://littlebinsforlittlehands.com/candy-dna-model-edible-science-activitiy>
Cell: <https://www.123homeschool4me.com/jell-o-animal-cells-and-more-homeschool> 89/
4. <https://www.science-sparks.com/surface-tension-of-water/>
5. <https://leftbraincraftbrain.com/biology-of-bread/>
6. <https://www.giftofcuriosity.com/preschool-botany-lesson-part-3-dissecting-a-flower/>
7. <https://schoolingamonkey.com/rainbow-naked-eggs-experiment/>
8. <https://www.kcedventures.com/exploring-habitats-40-projects-science-activities/>

March Take Action:

1. <https://team-cartwright.com/binary-beading/>
2. <https://raisinglifelonglearners.com/make-a-paper-plate-maze-stem-challenge/>
4. <https://scratch.mit.edu/>
5. <https://team-cartwright.com/lego-coding-activities/>
6. <https://youtu.be/g1J4181W8ss?si=J06Rycf2Ra6lkdRG>
7. <https://drive.google.com/drive/folders/>
8. <https://learn.microsoft.com/en-us/dotnet/desktop/winforms/advanced/types-of-bitmaps>

April Take Action:

1. <https://blog.kaplanco.com/ii/diy-robot-hand>
3. <https://www.jpl.nasa.gov/edu/mars-rover/>
5. <https://drive.google.com/drive/folders/18q7jlbiIY1fWU8xCTYTGenWSeFtyGB1F?usp=sharing>
6. <https://www.smallstepforstem.com/robotic-art-scribble-bot/>
8. <https://researchparent.com/learn/technology-engineering/robotics/>



S.T.E.A.M. Explorers

Resources

May Take Action:

1. https://www.momjunction.com/articles/dance-games-and-activities-for-kids_00399936/
3. <https://denverphilharmonic.org/draw-what-you-hear/>
5. https://www.momjunction.com/articles/musical-instrument-crafts-kids_0074932/?ref=jo

June Take Action:

2. <https://aturtleslifeforme.com/teaching-kids-to-budget/>
5. <https://msmoney.com/investing-games-for-kids/>
6. <https://parentvault.com/how-to-make-diy-spend-save-give-jars-free-printable-labels/>
8. <https://youtu.be/9ZqkecHnFpc?si=u56AB4Az6Jrq9aaL>

July Take Action:

2. <https://www.mombrite.com/oreo-cookie-moon-phases>
3. Solar: <https://youtu.be/cxrLRbkOwKs?si=u8WkNfstUmXkJpT2> Lunar: <https://youtu.be/VW2xRR75lKE?si=r2sAZb38KwdR5buQ>
4. <https://viewsfromastepstool.com/constellations-for-kids>
5. <https://drive.google.com/drive/folders/>
6. <https://www.mombrite.com/making-moon-crater-activity/>
7. Neil Armstrong: <https://youtu.be/cwZb2mqId0A?si=LmwovLRMscJvY4XO>
8. <https://spaceplace.nasa.gov/>

August Take Action:

1. <https://craftwhack.com/kids-activities-blog-wrote-book/?crlt.pid=camp.JOiFptHDD0HC>
2. <https://stepbysteppainting.net/2020/07/24/acrylic-pouring-painting/>
3. <https://toddlerapproved.com/rainbow-spin-art-painting-activity/>
5. <https://thepinterestedparent.com/2017/01/50-painting-without-brushes-ideas/>
6. <https://www.creativegreenliving.com/2017/10/how-to-get-started-painting-rocks>