

# 2019-2020 STEM Patches

To order any 2018-2019 STEM/Outdoor Patches go to:

<http://bit.ly/gsakpatchorder>

\*Availability of these past patches is not guaranteed. Please contact the council at [shop@girlscoutsalaska.org](mailto:shop@girlscoutsalaska.org) or 907-248-2250 to inquire about availability.



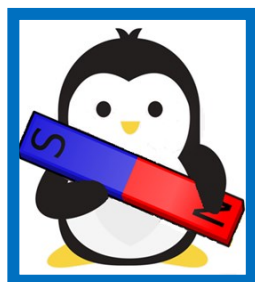
Endangered and Extinct  
Animals



Water Wonders



Communication and  
Codes



Polar Patch



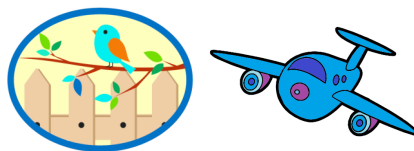
Math Mania



The Buzz About Bees



Pandemic Prepared



Backyard STEM and Beyond



Summer Solstice



Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your Endangered and Extinct Animals patch!

**Extinct Animals**— Extinct Animals are no longer found on earth. Some animals, like dinosaurs went extinct millions of years ago. Other animals were alive much more recently, some going extinct due to human impacts. Check out some of the more recently extinct animals like the Dodo here: <https://www.natgeokids.com/uk/discover/animals/general-animals/extinct-animals/> and here: <https://www.thoughtco.com/recently-extinct-animals-1092157>. After finding out facts about some extinct animals try playing Extinct Animal Charades or Pictionary.

**Endangered Animals**—Learn more about an endangered animal by trying out one of the World Wildlife Fund's Lessons or activities. <https://www.worldwildlife.org/teaching-resources/>

**Animal Stories**—There is hope! Many animals have gone from endangered or threatened to thriving, or at least on their way. Bald Eagles, Manatees, Gray wolves and more have made comebacks. Read about a few success stories here: <https://www.npca.org/articles/880-9-wildlife-success-stories>. Then envision a success story for a currently threatened or endangered animal. What is causing the species to struggle? What happens that creates a change? Could you be part of that change? Write or tell your story to others to spread hope for the future! You can use <https://www.nationalgeographic.org/projects/photo-ark/> to see amazing photos of over 9000 different species.

**Animals In Your Backyard**—One of the best ways to help animals across the world is to become familiar with the ones in your backyard. Take sometime to go on an animal scavenger hunt and see how many different animals you can find in your yard, a park, or a trail near your house. Don't forget about the little ones, insects and bugs are animals too! When you find a new animal, see if you can figure out what it is using a guidebook or another source. Then take some time to observe it's behavior. What do you notice. You could even create a field notebook to document what you find. Next go beyond your backyard and make some observations as you watch Live Cam Feed of animals (some are endangered or threatened) from the San Diego Zoo. <https://zoo.sandiegozoo.org/live-cams>

**White Rhinos**—This year's Girl Scout Fall Product Program mascot is the Northern White Rhino which represents the strength Girl Scouts have. Najin and Fatu, a mother/daughter pair, are the last two Northern White Rhinos left in the world. Participate in this year's Fall Product Program. Get started here: <https://www.girlscoutsalaska.org/en/cookies/fall-product-sale.html>. You can also test your Rhino (or other animal) IQ with some trivia here: <https://www.worldwildlife.org/pages/animal-trivia-games>

**Celebrate and Take Action**—World Animal Day is October 4th and has been celebrated since 1931. Celebrate by showing how much you care for animals. find out what is causing the decline of one of your favorite species and take action to help it. Most animals go extinct because of habitat loss, an introduced species, pollutions, population growth, or overconsumption. Endangered animals are a big issue, but remember the small things you do can make a big difference.

**Endangered Species Art**—Exercise your creativity and get started on an entry for the 2020 Saving Endangered Species Youth Art Contest. Read all of the requirements here: <https://www.endangered.org/campaigns/endangered-species-day/saving-endangered-species-youth-art-contest/>

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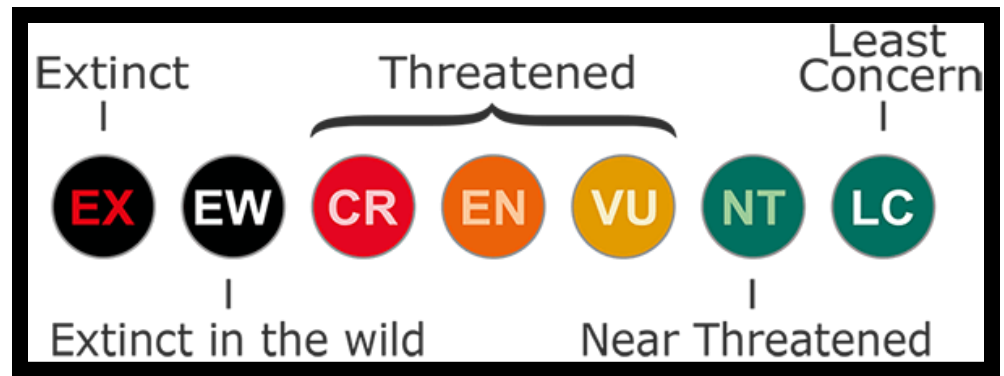


## IUCN Red Data Book : Threatened Species classification

Threatened species are any species which are vulnerable to extinction in the near future.

International Union for Conservation of Nature treats threatened species not as a single category, but as a group of three categories: vulnerable, endangered, and critically

endangered, depending on the degree to which they are threatened.



### Critically Endangered Species

Critically Endangered (Cr) is the highest risk category assigned by the IUCN for wild species. Critically endangered species means a species numbers have decreased, or will decrease by 80% within three generations. It is therefore considered to be facing an extremely high risk of extinction in the wild.

### Endangered (EN) species

Endangered (EN) species is a population of organisms which is at risk of becoming extinct because it is either few in numbers, or threatened by changing environmental or predation parameters. Also it could mean that due to deforestation there may be a lack of food and/or water. It is therefore considered to be facing a very high risk of extinction in the wild.

### Vulnerable (VU) species

Vulnerable (VU) species is a species which has been categorised by the IUCN as likely to become endangered unless the circumstances threatening its survival and reproduction improve. It is therefore considered to be facing a high risk of extinction in the wild.

### Other divisions: Extinct, Functionally Extinct and Extinct in the Wild

A species becomes extinct when the last existing member of that species dies. Extinction therefore becomes a certainty when there are no surviving individuals that are able to reproduce and create a new generation. A species may become functionally extinct when only a handful of individuals survive, which are unable to reproduce due to poor health, age, sparse distribution over a large range, a lack of individuals of both sexes (in sexually reproducing species), or other reasons.

An important aspect of extinction at the present time is human attempts to preserve critically endangered species, which is reflected by the creation of the conservation status "Extinct in the Wild" (EW). Species listed under this status by IUCN are not known to have any living specimens in the wild, and are maintained only in zoos or other artificial environments. Some of these species are functionally extinct; as they are no longer part of their natural habitat and it is unlikely the species will ever be restored to the wild



# Water Wonders

Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your Water Wonders patch!

**Water and Curiosity**— November 8th is National STEM/STEAM Day. To celebrate (its okay if it is another day) ask a question and design an experiment or do some research to find your answers. Have you ever wondered if objects float better in salt water or fresh water? How about how glaciers form a fiord? What about how many drops of water fit on a penny. Practice your curiosity and learn something new!

**Water and Gratitude**— Having readily available clean water to drink is something many people take for granted. Water shortages can exist due to droughts in areas, pollution can cause water to be unsafe, or maybe you are out backpacking and need to filter water to drink. Choose to find out more about one reason someone may not have clean drinking water and find out more about what you can do about it. Then drink a large glass of water and practice sharing gratitude.

**Water and Zest**— Zest is approaching life with energy, enthusiasm, and positive outlook. Water can be super fun and help you practice and build zest. Try playing in the snow, visiting a pool, water color painting, or experimenting with water. Afterwards, share your favorite part with a family member or friend.

**Water Cycle**— Learn how water moves through the world through evaporation, condensation, precipitation and more here: <https://www.usgs.gov/special-topic/water-science-school/science/water-cycle-schools>. To see the water cycle in action try out one of the following activities. Make your own terrarium [https://www.fairchildgarden.org/portals/0/docs/education/downloadable\\_teaching\\_modules/school%20gardens/terrariums%20and%20the%20water%20cycle.pdf](https://www.fairchildgarden.org/portals/0/docs/education/downloadable_teaching_modules/school%20gardens/terrariums%20and%20the%20water%20cycle.pdf) or create a cloud in a jar <https://inspirationlaboratories.com/science-at-home-make-a-cloud-in-a-jar/>.

**Water in Nature**— Get out and explore the water around you. Visit a lake, river, waterfall, glacier, or a snowy area. While you are there, make some observations. What role does the water play in the environment. Does it affect the plants, the animals, the earth?

**Water Power**— About 7% of the electricity generated in the United States is Hydropower (power from water). As gravity pulls water downstream, that movement can be transformed or stored as other energy forms. Create your own hydropower generator with simple supplies and instructions here: <https://www.education.com/science-fair/article/water-produce-energy/>

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# Communication and Codes

**Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your Communications and Codes patch!**



**Morse Code**— Learn to send a message in Morse Code. Try tapping out a message to a friend. Can you decode the message on the patch design?

**Learn a language**— There are over 6,500 spoken languages in the world today. Try learning some colors, numbers, or simple phrases in another language. You could even learn some American Sign Language. If you can, connect with someone who speaks the language you are learning. The best way to learn a language is to speak with someone who is fluent.

**Plants and Fungi**— Find out how plants communicate with each other using a network of fungi. Read article from BBC Earth here: <http://www.bbc.com/earth/story/20141111-plants-have-a-hidden-internet> or watch the video here: <https://www.youtube.com/watch?v=dibKZHhij6k>. Share what you learned with someone who didn't already know this information.

**Hour of Code**— Learn about computer coding. From block coding to javascript, there are many different ways programmers tell computers what they want them to do. Try your hand at coding by participating in the hour of code. There are coding options for kids brand new to coding up through experts. <https://hourofcode.com/us/learn>

**Create your own Code**— Using pictures, symbols, letters, or actions, create your own code. Teach your code or give a key to your friends, family, or troop members so you can send messages to each other.

**A Picture is Worth a Thousand Words**— Pictures and images are used in many ways today to share information. Think about the signs you see everyday. From road signs to emojis, there are many messages you get without words :). There are even entire books that tell a story with no words. Test out your artistic side, and create a sign, picture, or story that communicates a message with no words.

**Origami Coding**— Origami is full of algorithms and sequences. Essentially you are reading code when making origami. When it doesn't go right you have to do some debugging. Use these instructions to learn about coding through origami! <https://teachyourkidscode.com/origami-unplugged-coding-activity/>

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**Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your Polar Patch!**

**Polar Animals**— From penguins in Antarctica to puffins in the Arctic, there are so many amazing creatures that live in polar climates. With your friends, brainstorm a list of animals that live in each region. Start by sorting these out, then add more: penguin, polar bear, caribou, walrus, orca, seals, narwhal, beluga, snowy owl, albatross. Do any of these animals live in both polar environments? Choose one polar animal to find out a cool fact about and share your new knowledge with a friend. You could also create a story or art piece starring your polar animal!

**Magnetic Poles**— Did you know earth has a magnetic field? Use magnets and a compass to map the magnetic fields and identify the north and south poles of magnets. Instructions are available here: [https://nationalmaglab.org/images/education/magnet\\_academy/searchable\\_docs/activities/draw\\_field\\_lines.pdf](https://nationalmaglab.org/images/education/magnet_academy/searchable_docs/activities/draw_field_lines.pdf)

**Polar History**— Like the rings of tree trunks record a history of a tree's experience, an ice core can tell researchers a lot about what that area of a glacier experienced. In a year with more snow, the ice layer will be thicker. Some layers may have dust or debris indicating forest fires, volcanic eruption or other events. Troop leaders or parents can use this resource to create an ice core that can be studied by girls. <https://byrd.osu.edu/sites/default/files/recordinghistoryv10.pdf> If you have a chance to visit the edge of a glacier you may be able to see the lines indicating the different year's growth. If you do visit a glacier, make sure you take safety precautions as glaciers can calve and break off.

**South Pole Living**— What is it like to live for a few months at a research base on Antarctica? Find out by talking to someone who has been there; Check out our January Virtual Program. If you can't talk with someone who has been there, try watching a video like this one by where the New York Times takes you on a virtual tour of the McMurdo Station. <https://www.youtube.com/watch?v=nZr5MJuNcXU>

**Polar Lights**— The aurora borealis (northern lights) and aurora australis (southern lights) are beautiful displays not seen in the equatorial regions of the world. Learn more about what causes the northern and southern displays and why the polar regions are most likely to see their skies light up. <https://spaceplace.nasa.gov/aurora/en/> Use this site by the Geophysical Institute to find out when we are likely to see an aurora and then spend some time outside on a clear evening and see if you can spot it. <https://www.gi.alaska.edu/monitors/aurora-forecast>

**Penguin Day!**—January 20th is National Penguin Awareness Day. Celebrate penguins with one or more of the following ideas. Watch a penguin movie, create a penguin costume and make up a fun penguin skit, learn about a new kind of penguin (have you heard of a yellow-eyed penguin or a fairy penguin?), create life size drawings of different kinds of penguins (emperor penguin—48 in, Gentoo penguin—30 in, Rockhopper penguin 22 in), or come up with your own way to celebrate!

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**Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your Math Mania Patch!**

**Math and Coding**— Learn about shapes and patterns through the “Code with Anna and Elsa” Hour of Code activity. <https://hourofcode.com/frzn>. For older girls, try out the unplugged Color By Pixel activity to learn about computer graphics. <https://codehs.com/uploads/40baf83c2547910235cebc2c1f4839a4>

**Math in Games**— Math can be fun with some dice, cards or other games. Try playing Yahtzee, Farkle, Quirkle, Set or others games. These kinds of games teach pattern recognition, sequencing, logic, math facts and more. Here are some dice games to get you started: <https://icebreakerideas.com/dice-games/>.

**Cookie Math**—Are you getting ready for booth sales? Make sure you know your numbers. How much does a box of cookies cost? Do a role play with cookie boxes and fake money and practice counting change. Switch it up so girls can practice being a customer and a cookie seller. This is a great time to practice your sales pitch too!

**Math in the Kitchen**—Try out a new recipe for cookies, cake, or another fun item. As you follow the recipe, learn about fractions, measuring tools and more. Need a challenge? Try a double or triple batch and do the math to make dessert for all your friends! Bonus: Try out your budgeting skills by shopping for supplies. Add up the cost of ingredients as you go and compare the prices for different brands.

**Math in Design and Construction**—Measure twice cut once! Creativity combined with mathematics can create some amazing results. Try designing and building something—a cardboard house for your cat, a wooden birdhouse, or your own idea. You could also try your hand at redesigning your room. Measure the space, your furniture and see how you can move things around. <https://www.education.com/download-pdf/activity/50533/>

**Snow Math**—Get outside. Using snowshoes or just your boots, stamp out a pattern using shapes in the snow. Plan your design first by drawing your design and deciding how many steps each line will take. Learn some geometry along the way as you incorporate triangles, circles, parallelograms or other shapes in your design. Get some inspiration for your snow art by checking out Simon Beck’s art. It takes all day and miles of walking to create these patterns. <https://www.facebook.com/snowart8848>

**Fast Math**— Try out skiing, sledding, hiking or another activity and do some calculations. First measure the distance you will go. You could use a tape measure or meter stick for a shorter distance and for a longer distance or curvy path measure a length of yarn and then use that to measure distance. Next use a stop watch to time yourself as you sled down the hill or snowshoe on a trail. To calculate your speed, take the distance and divide it by the time it took you. For example, if it takes 10 seconds to sled 300 feet, you would take 300 feet/10 seconds and get 30ft/second. Use a calculator to help you if needed. For older girls, try converting to another unit like miles/hour. Remember to be safe and check out the Safety Activity Checkpoints for any activities you will be trying. <https://tinyurl.com/GSAKSafetyCheckpoints2019>

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# The Buzz About Bees



**Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your Buzz about Bees Patch!**

**Dance Like a Bee:** Do the Waggle Dance! Bees let other bees know where the good nectar and pollen is by dancing. Their Waggle Dance tells both direction and distance to the flowers. Try out the bee's communication style with this Waggle Dance activity: <http://sciencenetlinks.com/afterschool-resources/dances-bees/> Bees also dance to communicate danger, need for grooming, to distract or entertain the queen or to encourage others to help with gathering nectar.

**Bee Anatomy:** Learn about the parts of a bee and how they are used. Do you know how many legs a bee has? What is a proboscis used for? Find out here: <https://drive.google.com/file/d/0B-h4gnY-J6NdWHA1NWZKc0dXSjO/view>

**Buzzy Bees:** The buzz of a bee is caused by the vibration of their wings. You can make a vibrating instrument that will sound like the buzzing of a bee by using some simple supplies and the science of sound waves. <https://www.scientificamerican.com/article/buzz-like-a-bee/>

**Bee Creative:** Honey and Beeswax come from bees and are used in many different products from Lip balm and lotion to baked goods and candles. Look up a fun recipe or project using beeswax or honey and make it with your troop or family.

**Bee Entrepreneurs:** Bees are a big business. Bee keeping, honey production and creation of other products from bees are careers for many. Talk to some one in the Bee industry and find out more about what they do, what tools they use, and how they run their businesses.

**Sweet as Honey:** Honey comes in different colors and flavors and it all has to do with the kinds of flowers bees get their nectar from. Learn more about honey colors and flavors here: <https://www.honey.com/newsroom/presskit/honey-color-and-flavor> and try out different types. Farmers markets are a great place to find different honey varieties.

**Pollinators in Danger:** Pollinators move pollen from one flower to another so that the plants can reproduce. Humans need pollinators for our food to grow. Some bees and many other pollinators have been listed as endangered species. Learn more about an endangered species and share what you learn with someone else. Can you think of a way to help a pollinator? <https://www.fws.gov/endangered/>

**Help a Bee:** Bees make honey and are generally not aggressive creatures. Honey bees help plants pollinate and make honey for us (they make more than the colony needs). You can help honey bees by planting bee friendly plants and flowers in your garden. If it is not time to plant outside, you can start some flowers in a pot indoors. <https://www.honey.com/files/general/Educational-Materials-What-Do-Bees-Do-Activity-Sheet.pdf>

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**Adults:** Before starting this patch with girls take a look at the resources available to you.

Talking about viruses, illness, and pandemics can be a sensitive topic for adults and children. Everyone has been affected by COVID-19 in some way including kids. Experts have put out many resources for talking with kids and reducing the anxiety around this pandemic. For many girls learning more about the virus, how it works and what they can do to stay safe and help others can ease fears and stress and that is the goal of this patch. As you work on patch activities, please put physical and emotional safety of girls first. Girls may need a break from activities or time to talk with trusted adults about their feelings.

#### Resources for Adults:

- Read GSUSA's article "How to Talk to Your Kids About Coronavirus" for tips on how to start a conversation and learning about viruses and pandemics without spiking fear in girls: <https://www.girlscouts.org/en/raising-girls/happy-and-healthy/happy/coronavirus-and-kids.html>.
- The National Association of School Psychologists has put out this resource for parents about helping kids through this stressful time: [https://www.nasponline.org/resources-and-publications/resources-and-podcasts/school-climate-safety-and-crisis/health-crisis-resources/talking-to-children-about-covid-19-\(coronavirus\)-a-parent-resource](https://www.nasponline.org/resources-and-publications/resources-and-podcasts/school-climate-safety-and-crisis/health-crisis-resources/talking-to-children-about-covid-19-(coronavirus)-a-parent-resource)
- An article from the Child Mind Institute: <https://childmind.org/article/talking-to-kids-about-the-coronavirus/>
- CDC COVID-19 information: <https://www.cdc.gov/coronavirus/2019-ncov/index.html>
- Girl Scouts of Alaska webpage with virtual programs, digital activities, outdoor activities and more for girls compiled from many different organizations: <https://www.girlscoutsalaska.org/en/events/virtual-program.html>



# Pandemic Prepared



**Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your Pandemic Prepared Patch!**

**Build an Emergency Kit:** No matter the emergency, having some basic supplies ready to go will help your family be prepared. Learn what should be included by playing an online simulation and printing out a checklist here: <https://www.ready.gov/kids>

**Keep Calm And \_\_\_\_\_:** Staying calm and lowering stress during a disease outbreak or other disaster can be challenging. Learn a new way to cope with stress and try it out. You could try taking a break from the news, learning a new skill like baking, spend time outdoors (as long as it is safe), or do some stretching or physical activity. The CDC has some information about managing stress and anxiety here: <https://www.cdc.gov/coronavirus/2019-ncov/prepare/managing-stress-anxiety.html>

**Soap Science:** Soap is a key defense against diseases including viruses. Soap breaks down parts of the virus making it unable to harm you. Watch this short video to learn more about soap: <https://www.youtube.com/watch?v=XntinCBEC9U>. Try making your own soap. Washing hands is always more fun with soap you make! <https://www.artbarblog.com/homemade-rainbow-soap-with-kids/>. You can also design an experiment to test how well washing your hands works. Use this site for an example: <https://www.mottchildren.org/posts/camp-little-victors/dirty-hands>

**Sing and Scrub:** Learn how to properly wash your hands. A full 20 seconds is needed to do it right. Sylvia Acevedo shows her handwashing skills in her video here: <https://www.facebook.com/watch/?v=1315192678664297>. Come up with your own song that lasts 20 seconds, or choose one of your favorite songs and create a handwashing poster here: <https://washyourlyrics.com/>. Put up a reminder poster in your own bathroom to make sure you and your family members wash their hands! Share your handwashing technique with a younger sibling family member or friend. If you can't get together in person, use technology to connect!

**Viruses:** Find out how viruses like coronavirus infect the human body by watching this video: <https://www.brainpop.com/health/diseasesinjuriesandconditions/viruses/>. Viruses are so small you can't see them without a microscope, but we can make models of them to learn what they look like. Try it out here: <http://www.ellenjmchenry.com/homeschool-freedownloads/lifesciences-games/documents/Cutandassemblevirusmodels.pdf>

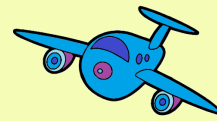
**Social Distance Math:** Social distancing means staying home and avoiding interactions with as many people as possible. This presents many challenges for families and communities. Is it worth it? Take a look at simulations of how diseases spread through communities with and without social distancing measures in place. <https://www.washingtonpost.com/graphics/2020/world/corona-simulator/>. The goal of social distancing is to "flatten the curve." Without taking these kinds of precautions, the virus would spread in an exponential way. Exponential growth means that something is growing faster and faster over time. To visualize exponential growth, find something small that you have a lot of (candies, beads, squares on graph paper). Start with one of your items. Every 30 seconds double your pile. Your pile will grow exponentially. After 30 seconds you have 2; after a minute, you have 4, 90 seconds you have 8. Keep going until you run out of items. If you can, use paper or a program like Excel to graph your exponential growth. Can you calculate how long it would take to get to 1000?

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# Backyard STEM And Beyond!

**Double Patch!** Earn the “Backyard STEM” patch by completing 3 activities of your choice. Complete another three to earn the additional “And Beyond” Patch



**Garden Engineering:** Design and build a planter box for flowers or veggies. Think about what materials you will use. Do you want to build it out of wood? How about recycling an old tire or rain boot? What do you think would make a good planter? Talk to someone who has a garden or grows plants and find out if there is anything special you should consider when building you

**Solar Cooking:** Roast a marshmallow or other treat by building a simple solar cooker and learning how to find the focal point or focus of a parabola. Start with the directions here <http://almostunschoolers.blogspot.com/2015/05/parabolic-solar-shoebox-cooker-math-you.html>. The math in the experiment can be adjusted for the level of your girls. You may want to start by learning about the parabola shape or advance to specific calculations and finding the focus point.

**Bike Rodeo:** Grab your helmet and get ready for some fun! Using chalk, cones, or other object found in your home or garage, create some bike challenges. Maybe you will weave around cones or toss a ball into a bucket while riding. What kind of challenges will you engineer? Will you use math skills to keep score? How fast can you go? Find out by calculating your speed. Take the distance you rode and divide it by the time it took. This is your speed.

**Backyard Bioblitz:** Biodiversity is a measure of how many different living things are found in an area. Backyards can be filled with life. Use a magnifying glass, a fieldguide, a camera, or just your eyes to search your yard for all the living things you can find. Record them by taking pictures or drawing in a journal. <https://www.nationalgeographic.org/activity/backyard-bioblitz/>

You could also choose one plant to watch as the buds begin to grow into leaves. Track your plant overtime to see how it grows. <https://extension.unh.edu/resource/outdoor-science-activity-buds-begin-grow-march-may-stem-activity>

**Bubble Fun:** Try out this recipe for giant bubbles and make your own giant bubble wand. <https://happyhooligans.ca/homemade-giant-bubbles/> or use straws and pipe cleaners to make some fun shaped bubbles. Watch this video to find out more: <https://www.youtube.com/watch?v=pYxxFMUmuk4>

**3... 2... 1... Blast Off:** Build a rocket! Your rocket could be powered by a chemical reaction like this one: <https://www.youtube.com/watch?v=jjU1lAgRcOg>, powered by the force of air like this one: <https://www.youtube.com/watch?v=GQ32ShfE6k4>, or a rubber band powered rocket like this one: <https://www.instructables.com/id/Rubberband-Slingshot-Rocket/>. Once you build your rocket and launcher, test it out. Does it fly well? Think about what you could change to make it better and experiment. There are many kinds of rockets out there, so if there is a different one you want to try go for it! Make sure you get permission from your parents and stay safe. Depending on the kind of rocket you launch, safety classes may be needed.

**Get it done!** A Rube Goldberg machine takes a simple task and gets it done using a complex process. Building one is a great way to learn how different simple machines can act together. It might also be a really fun way of watering a plant or getting another chore done. Build your own Rube Goldberg machine. Start here to get some ideas: <https://www.connectionsacademy.com/support/resources/article/build-your-own-rube-goldberg-machine>





# Backyard STEM And Beyond!

**Scientific Observation:** Go for a walk in your neighborhood. Hone your observation skills with a game of I spy. See how descriptive you can be with your clues. Try things like “I spy something prickly” or “I spy something that moves very slowly.” Scientist use observation and descriptions often and they have to be very specific. Can you get your partner to guess it with only 5 clues? How about 3?

**Measure the Weather:** Try one or more of these ways to measure or record weather. Make a rain gauge to track how much rain your garden or backyard gets. You can find the instructions here: <https://nurturerstore.co.uk/how-to-make-a-rain-gauge-backyard-science>. You could also record the cloud types you see each day. To learn how to identify clouds check out this guide: <https://scied.ucar.edu/learning-zone/clouds/cloud-types> . Wind direction can be measured by holding up a flag do see which way it goes. Wind direction is always recorded by the direction that it originates from. Use a compass to find out if you have a north, south, east, or west wind. Remember if the tip of your flag is pointing east, it would be a west wind.

**Do your part:** Help you your environment and make your neighborhood cleaner with a family clean up day. Grab some trash bags and gloves and pick up trash. Want to make a bigger difference? Host a neighborhood clean-up block party. Make invitations or post signs and each of your neighbors can clean up their own yard all while keeping necessary physical distancing!

**Celebrate Birds:** May 4th is Bird Day and May 17th is International Migratory Bird Day. There are also a few bird festivals that typically happen in May such as the Kachemak Bay Shorebird Festival, Kenai Peninsula Bird Celebration, and Yakutat Tern Festival are just a few. To find out more about some of the Bird Festivals in Alaska visit: <https://ak.audubon.org/birds/bird-festivals-alaska>. Most of these festivals have an online component to them. You could also celebrate by watching the birds in your yard. You could use binoculars to spot birds further away or use your observations to contribute to the birding community through citizen science at: <https://ebird.org/home>.

**Game On:** Create your own backyard game! You may have heard of corn hole or horseshoes, or bocce ball. Take a look at what supplies you have at home and create a fun game for you and your family to play. A fun game doesn't have to be hard or complicated. Put your creativity and design brain to the test! Once you try out your game see if you can improve it. Were the rules clear? What would make it even more fun?

**Flight Science:** Test out Bernoulli's principal by holding a piece of paper near your mouth and blowing across it. Do you think the paper will stay up or fall down? Next hold two pieces of paper and blow between them. Do they move together or apart? When air moves faster it lowers the pressure. This is important for airplanes to fly. Learn more about it here: <https://www.sciencekids.co.nz/lessonplans/flight/flightintroduction.html>! Next try making your own airplane. Use your own design or get some ideas here: <https://www.foldnfly.com/#/1-1-1-1-1-1-1-2> .

**Choose Your Own Adventure:** Come up with your own experiment, look up a STEM activity online to try, or challenge a family member to your own engineering challenge with materials found at home. Your options are endless. Explore something that you are curious about. This is your opportunity to be creative!

**Order your patches online here:** <https://www.cognitoforms.com/Girlscoutsalaska/GSAKPatchOrderForm>

Questions? Or need a paper form? Contact the program team at [program@girlscoutsalaska.org](mailto:program@girlscoutsalaska.org)





Learn about and celebrate the longest day of the year to earn your Summer Solstice Fun Patch

The summer solstice is the longest day of the year. In the northern hemisphere this happens on Saturday, June 20th, 2020. The earth's north pole tilts towards the sun and in places north of the arctic circle, the sun never sets.

Learn more about the summer solstice by watching this short YouTube video: <https://www.youtube.com/watch?v=SVzkVsWQBR8>

## Summer Solstice Fun Facts:

- Hours of Daylight on June 20, 2020 (Look up your location here: <https://www.timeanddate.com/sun/> )
  - Juneau, AK: 18 hours, 16 minutes
  - Bethel, AK: 19 hours, 11 minutes
  - Anchorage, AK: 19 hours, 21 minutes
  - Fairbanks, AK: 21 hours, 49 minutes (watch a past Fairbanks solstice time lapse here: <https://www.youtube.com/watch?v=4jLz7xy41X8>)
  - Utqiagvik, AK: 24 hours! (watch a time lapse of the summer sun in the North Pole here: <https://www.youtube.com/watch?v=ZZcavg-meJA>)
- When it is summer solstice in the Northern Hemisphere, The Southern Hemisphere is celebrating their winter solstice.
- All planets have a summer solstice, but it is not all the same day. Uranus only has a summer solstice every 84 years!
- There are places in Alaska, Iceland, and other northern locations where you can watch the sun "not set." The sun dips down toward the horizon and then starts to rise again.



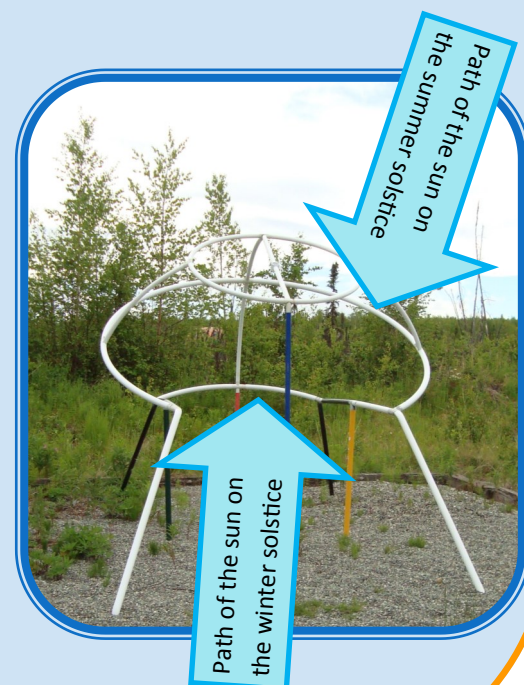
Learn about and celebrate the longest day of the year to earn your Summer Solstice Fun Patch

## Summer Solstice Activity Ideas:

- Plan a sun celebration
- Read the book [The Way to Start a Day](#) by Byrd Baylor
- Share gratitude
- Make a solar oven and cook something yummy!
- Use a compass to find out what direction the sun is at different times of the day
- Create sun inspired art. Try this Sunny Monoprint activity or come up with your own art project. <https://www.makeandtakes.com/welcome-summer-with-sunny-monoprints>
- Spread sunshine to others by doing something kind for another person
- Come up with your own idea for celebrating the summer solstice
- Check out the sun position in different parts of Alaska <https://avcams.faa.gov/>

## Learn About Pipehenge:

Pipehenge is an astronomy tool that also functions as jungle gym structure. The bars are designed for the specific location it is build for. They follow the path of the sun on the summer and winter solstices and can be used to observe the stars and moon in the night sky. GSAK Camp Togowoods in Wasilla, AK has the most northerly pipehenge in the world. You can learn more about pipehenge here: <https://thewonderofscience.com/phenomenon/2018/7/5/pipehenge-poor-mans-stonehenge> Keep an eye out for Pipehenge programming at CampTogowoods in the future!



**Order your patch online here:** <https://www.cognitofrms.com/Girlscoutsalaska/GSAKPatchOrderForm>

Questions? Or need a paper form? Contact the program team at [program@girlscoutsalaska.org](mailto:program@girlscoutsalaska.org)