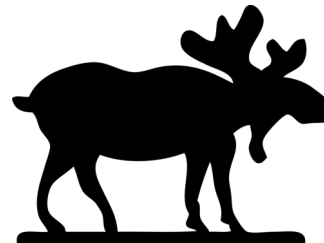


STEM/Outdoor Patches

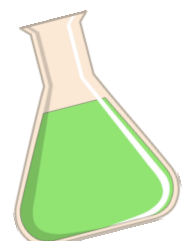
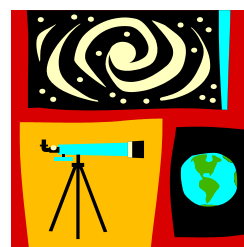
Please call the Girl Scout office at 907-248-2250 to check on patch availability and order patches. If the original patch is not available, there may be a fun patch that your troop can order instead.

1. Snow Science
2. Chemistry
3. Changing Seasons
4. Alaska Adventure
5. Eclipse
6. Food Science
7. Techno-Business
8. Physics in Motion
9. Hour of Code
10. Sound Science
11. Iditarod
12. Oceans and Waterways
13. Alaska Animals

Looking to infuse more STEM and outdoor activities into your troop's year. Take a look at these patch activities!



STEM





Snow Science

Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your Snow Science Patch!

Snow Chemistry—Become a food scientist by creating snacks from snow! Use these recipes to create your own snow ice cream or molasses candy.

<http://happyhooligans.ca/3-ingredient-delicious-vanilla-snow-ice-cream/>

<http://happyhooligans.ca/make-maple-syrup-snow-candy-3-simple-steps/>

Snow Structure—Go outside when its cold to blow bubbles and watch how crystals form as they freeze! What shape are the crystals? How are the crystals forming? Or, watch crystals grow by creating your own snowflake ornaments. Use borax, string and hot water to watch crystals grow before your eyes! Learn how to make snowflake ornaments here:

<http://chemistry.about.com/cs/howtos/ht/boraxsnowflake.htm>

Snow Physiology—Learn to take your pulse and try a snow activity such as snowshoeing, skiing, sledding or ice skating! What happens to your heart rate when you go fast? When you go slow?

Snowy Animals—Brr, its cold outside! But not for some Alaskan animals! Learn how animals stay warm in the winter and how some use the snow to stay warm. Identify animal tracks and become an Animal Detective in your own backyard! Use this guide from the Alaska Dept. of Fish and Game to help you become a better animal tracker:

https://www.adfg.alaska.gov/static/education/educators/pdfs/wild_wonders_issue2.pdf

Snow Engineering—Create snow structures to test the strength of snow. Build a snow bridge, a tall snow man or a snow castle! Use your imagination and become a snow engineer and test its strength.

Snow Experimentation—Be a snow scientist and design your own experiment involving snow or ice! Try making a hypothesis, experimenting, and analyzing your results.

*Websites are just suggested resources. You may use other sources you find.

Daisies and Brownies complete 2 activities, Juniors and up complete 3 to earn your Chemistry Fun Patch!



Chemistry in the Environment – The atoms and molecules that make up air, water, and the living things on earth are continuously interacting together. Pollution we create changes the chemistry of the air and then the rain. Discover more about acid rain and try an experiment to see how it affects the living organisms on earth. Then come up with and try out an idea to help improve the chemistry of our air and water. You can use these resources to help you out. <http://www.clean-air-kids.org.uk/acidrain.html>

<http://www.kidsecologycorps.org/kid-power/activities/create-acid-rain-in-your-own-kitchen>

Chemistry in the Kitchen – How did we come up with the perfect cookie? By experimenting! Why do we add baking soda? How does adding extra flour affect the fluffiness of cookies? Choose one variable and test out what happens if you add more or less of an ingredient. Find out what your troop's ideal cookie recipe is! Here is a great resource to get you started: <http://www.npr.org/sections/thesalt/2013/12/03/248347009/cookie-baking-chemistry-how-to-engineer-your-perfect-sweet-treat>

The Power of Chemistry – Chemical reactions are part of how power plants work, how heat is produced and how your vehicles run. Test out the chemical reaction of vinegar and baking soda, and use it to power a mini-boat. Can you figure out the best ratio of vinegar and baking soda to make your boat go the farthest? Check it out here: <http://www.kiwicrate.com/projects/Baking-Soda-Powered-Boat/2634>. For a different engineering challenge try making a rocket car by building wheels and axles for your vehicle.

Secret Codes with Chemistry – Try creating your own invisible ink and writing fun messages to your friends. Acidic solutions like lemon juice will react with heat from a light bulb to reveal your message. Find out more here: <https://www.scientificamerican.com/article/bring-science-home-invisible-ink/>

Chemistry in Art – Chemistry is an important part of many visual arts. From making paints from natural pigments to creating plastic buttons and many more. Try out an art project that uses chemistry. Some options include exploring the chemistry behind polymers and plastic by creating them from milk: <https://www.scientificamerican.com/article/bring-science-home-milk-plastic/>, making marbled milk paper: <http://babbledabbledo.com/science-art-for-kids-marbled-milk-paper/>, tie-dye using sharpies and rubbing alcohol: <http://www.sciencebuddies.org/hands-on-activities/tie-dye-markers?from=Blog>, or come up





Changing Seasons

Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your Changing Seasons Patch!

Seasonal Goals! Create some seasonal outdoor goals you would like to accomplish for the next year. What new outdoor skills do you want to learn in the spring? Summer? Fall and winter? Come up with a list of activities and learn new things!

Create a Seasons Travel Guide: Learn when other countries experience different seasons. How are they different from Alaska? Where are they located on the globe? Learn more by doing this cool activity to see how the Earth's tilt affects seasons in different countries! <http://serc.carleton.edu/introgeo/demonstrations/examples/seasons.html>

Animals and the Seasons: How do animals prepare for the changing seasons? Explore and research different animals and their adaptations to the seasons. Which animals hibernate? Do they change their diet or migrate? When do they have their young?

Signs of Spring Bingo: As the weather warms and the sun stays out longer, look for nature's signs of spring! Can you find new plant shoots or buds growing on trees? Do you notice new birds flying in the sky? Follow this link for a fun signs of spring bingo sheet: <https://www-static.bouldercolorado.gov/docs/spring-bingo-sheet-1-201305221032.pdf>

Seed Needs: Watch how seeds germinate by placing a bean seed in a warm wet paper towel. Find more information here: <http://www.science-sparks.com/2012/04/30/bean-in-a-jar/> Feeling inspired? Start your own garden with flowers and vegetables of your choice!

Transpiration Celebration! How do plants restore water lost through evaporation? Through transpiration! See flowers transpire in action by placing white flowers in dyed water and watching how their petals change color. Create your own unique flower combination for a celebration of spring! <http://www.science-sparks.com/2011/09/26/changing-colour-flowers-with-transpiration/>


Take Action! Design your own experiment, try a different activity or start a take action project. Make your community a better place with all the new science you've learned so far!






Alaska Adventure


Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your Alaska Adventure Patch!

Alaska Invaders – Learn to identify at least 1 invasive species and take action to help remove or stop the spread of the species. 


Alaska Waters – Visit an Alaskan stream, lake, ocean or other body of water. Find out what sorts of organisms indicate a healthy ecosystem and see if you can find some of them.

Alaskan Geology & Glaciology – Take a hike near mountains or a glacier and learn how they formed. Many park visitor centers will have great information for you. 

Alaska Meteorology – Learn about the different types of clouds then head outside for some cloud watching. What fun shapes can you find?

Alaska History – Alaska has a rich cultural history including old mining sites, Russian Orthodox Churches, abandoned gold rush towns and beautiful forests filled with native totem poles. Find a historical site near you and learn about its place in Alaskan history. 

Alaska Adventure – Take some time to enjoy the world around you and help organize a camping, backpacking or hiking trip with your family or troop. Be sure to take a look at the Safety Checkpoints before you go!

Take Action! – Take action in your community and organize a clean-up, restoration project, or earn your Girl Scout Ranger badge by volunteering at a National Park near you. Learn more here: www.nps.gov/subjects/youthprograms/girlscoutranger.htm 



Eclipse Patch



A solar eclipse will be occurring on August 21st, 2017. While a total eclipse can be viewed in the lower 48, a partial eclipse will be visible in Alaska. Learn about eclipses with activities from NASA and earn your special edition eclipse patch!

Turn in your this form by **September 15th** to ensure patch availability!

Patch Requirements

1. Find out what time the partial eclipse will be visible in your area and make a plan with your troop, family or friends to view the eclipse.

<https://www.timeanddate.com/eclipse/in/usa>

2. Learn how to safely view a solar eclipse.

<https://eclipse2017.nasa.gov/safety>

3. Learn what an eclipse is. What is the difference between a solar eclipse and a lunar eclipse. Build a model of an eclipse.

<http://www.unawe.org/activity/eu-unawe1302/>

4. Try out 2 different activities developed by NASA to learn about and celebrate eclipses.

<https://eclipse2017.nasa.gov/>





Food Science



Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your Food Science Patch!

Map Your Pantry— Most of the foods we have in our kitchens travel for miles and miles until they reach their final destination, our plates! But, where did all this food come from? On average, most U.S ingredients travel more than 1,500 miles before they end up on your plate. Learn where your food comes from by creating a map of where your food comes from. On the map mark where you live and then put a dot on each state or country named on the labels. Go to eatlowcarbon.org to calculate the amount of potential greenhouse gases emitted by various foods. How can you reduce the energy consumption of your food?

Create a Compost Bin— Composting is nature's way of breaking down biodegradable materials into nutrient rich soil. Anything that was once living will decompose. You can create your own compost bin to reduce waste going to the landfill. Check out this website to learn how to make your own compost bin:

www.gardeningknowhow.com/special/children/composting-ideas-for-kids.htm

Subsistence Living— Subsistence in Alaska is a way of life. We all depend on the land whether its fishing, hunting, berry picking and even gathering fire wood. Learn about wild edibles in your area and make a delicious treat! Be sure to use only plants that will not make you sick. Or, try a food such as salmon, halibut, caribou, moose or another food that was gathered within Alaska. Learn about where its from and its journey to your kitchen.

That Rocks!— Create your own rock candy! Learn how sugar crystals form by creating a cool and delicious treat. <http://discoverykids.com/activities/rock-candy/>

Locally Grown Meal— Create a meal on Alaskan fueled foods! Visit the grocery store and look for foods that are grown in Alaska, visit a U pick it farm, or your own garden and create a delicious meal.

Become a Food Scientist— Be a food scientist and design your own experiment involving food! Try making a hypothesis, experimenting, and analyzing your results. Check out this website for more ideas: <http://www.playideas.com/25-edible-science-experiments-for-kids/>

*Websites are just suggested resources. You may use other sources you find.

Techno-Business

Daisies and Brownies complete 3 activities, Juniors and up complete 4 activities to earn your Techno-Business Patch!

Technology is changing how businesses run. Online shopping is becoming the norm and girls now have the option to take this on by creating their own online store! This patch is designed to work with the Fall Product Sale; however, girls are not required to sell any products to earn the patch.

These forms are due by November 15th.



Online Safety - Read and sign the online safety pledge at <http://www.girlscouts.org/en/help/help/internet-safety-pledge.html> . Ask an adult if you have questions about what online activities are safe.

Create your own Avatar - Log in to the product sale webpage and create your own Avatar. Use the controls to design the avatar to look like you or just be creative!

Make it Visual - Practice your photo or video editing skills and post a picture to your online storefront to encourage visitors.

Logo Design - Use a computer program to design your own digital business logo. Create one for your product sale storefront or a logo for a future business you dream up.

Goal Setting - Set your own SMART goal. Whether you are a scientist or business guru, goal setting is key to becoming your best. Try your best and work hard to achieve your goal!



Thanks a Lot - Learn about coding as you use computer code to make a unique thank you card to send out to all of your customers. Visit <https://app.vidcode.io/hourofcode/gs/1> to find out how!

Physics in Motion



Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your Physics in Motion patch!

Inertia Tower— Learn about Newton's First Law by creating an Inertia Tower! In this activity girls will learn how objects at rest will stay at rest and objects moving at a constant velocity will continue to move at a constant velocity. Create a tower of blocks and notecards, try to move the notecards at a high enough velocity to keep the blocks in place! Learn more about the activity here:

www.perkinselearning.org/accessible-science/activities/inertia-tower

Slipping and Sliding— Friction is a force that opposes movement between to objects. Try sliding on different types of floors with socks, bare feet or other materials. Try sliding on a frozen puddle! Slide on the snow with skis, a sled or a snowboard. Which made you go the fastest? The slowest? Which materials created the most friction? Less friction? Have fun and be safe during this motion activity!

Want to learn more about friction? Check out these activities here: www.sciencefriday.com/educational-resources/slippy-soles-lesson-friction/

Save the Egg!— Gravity is a force of attraction. Objects with mass exert a force that keeps nearby objects near or around itself. For example, the earth has a mass of 5.972×10^{24} kg which creates a force strong enough to keep our feet on the ground! It even has an effect on the moon. When things fall, some move faster than others. This is because of air resistance. Create a parachute for an egg to slow down its decent so the egg doesn't crack! Learn more here:

www.science-sparks.com/2011/09/08/gravity-and-air-resistance/

Make Your Own Buzz Toy— Learn about torque and inertia by making your own buzz toy. Buzz toys are thousands of years old and are easy to make. All you need is string, scissors and a piece of paper.

What makes the circle go faster? Slower? What happens when you make the circle larger or smaller? Check out this website to learn more: www.sciencefriday.com/educational-resources/measure-the-rotational-speed-of-a-toy/?_sft_subject=physical-science

Become a Rocket Scientist!— Create a balloon rocket and transport cargo in this fun activity. For an object to move, a force must act upon it. Rockets use thrust to get them to fly up into space. In this activity, a balloon will move from the pressure being exerted upon it. Learn more about this activity here:

www.sciencefriday.com/educational-resources/balloon-rockets/?_sft_subject=physical-science

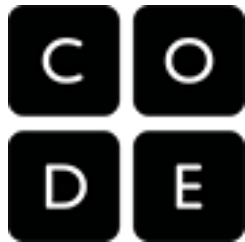
Build a Roller Coaster— Design and create your own roller coaster using materials found around your home. Which materials work best? Cardboard, plastic or other materials? Can you create a loop-de-loop? How fast does your cart go? Want to learn more? Check out this website on potential and kinetic energy:

www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p037/physics/roller-coaster-marbles-converting-potential-energy-to-kinetic-energy#background

No Experience Needed



Hour of Code



New Patch, New Activities

Letter	Binary	Letter	Binary
A	01001000	N	01101100
B	01011000	O	01101111
C	01001100	P	01100100
D	01000100	Q	01011000
E	01101000	R	01011001
F	01011010	S	01100101
G	01010100	T	01101000
H	01000010	U	01010100
I	01001001	V	01011010
J	01011011	W	01101101
K	01010110	X	01100110
L	01111000	Y	01101101
M	01101101	Z	01101110

Complete at least 3 activities to earn your Hour of Code Patch.

1. Make Christmas ornaments with pipe cleaners and pony beads or another project where you used binary code to represent letters of the alphabet and spell a holiday word such as SNOW or SANTA. More information is available here: <https://littlebinsforlittlehands.com/christmas-coding-activity-stem-ornament-binary-alphabet/>
2. Be a programmer; try out this movement game to learn about conditional statements. Daisies through ambassadors can have fun with the different variations of this game. <https://leftbraincraftbrain.com/if-then-backyard-coding-game-for-kids/>
3. Complete 1 "Unplugged" Activity found here: <https://code.org/curriculum/unplugged>. Daisy/Brownie girls try Move It, Move It. Junior and up girls try Graph Paper Programming, or Tangrams.
4. Try out an online coding program at <https://code.org/learn>. Programs for all ages include Coding with Anna and Elsa, Make a Flappy Game, Minecraft, and more. New activities have been posted for 2017!
5. Make a spy decoder to send secret messages to your friends. Check it out here: <http://dabblesandbabbles.com/wp-content/uploads/2015/10/Secret-Decoder.pdf>





SOUND SCIENCE

Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your Sound Science patch!

Making Music— Try playing a song on drinking glasses filled with different amounts of water. How does the amount of water affect the pitch? Find out more here: <https://www.connectionsacademy.com/resources/instructographics/music-water-glasses>

Turn up the music— Explore amplification (volume) of sound by making your own set of speakers or a megaphone. Experiment to find out what shapes and materials make sounds louder. Directions for a make your own speaker: <https://www.thecrafttrain.com/diy-iphone-speaker/> Directions for making a megaphone: <http://www.monstersciences.com/sound/sound-science-experiment-sound-amplification/>

Seeing Sounds!— Sounds are waves and as they move through the air, the waves affect their surroundings. This could be your ear drum (how you hear sound) or rice on top of a bowl. Get instructions for this fun science experiment here: <http://coolscienceexperimentshq.com/how-to-see-sound/>

Nature Sounds— Try getting outside and creating a sound map. Sit quietly and write or draw the things you hear around you. Check here for more tips on sound mapping: <https://www.sharingnature.com/sound-map.html>

Blocking Sound: How are sound proof rooms designed? Why can you hear through some walls and not others? Test out materials that block sound with this experiment here: <http://www.science-sparks.com/2014/04/28/properties-materials-muffling-sound/>

Is One Ear Better than Two?— Try out this experiment. Cover one ear and close your eyes have a friend stand in the front, back, left or right of you. Can you figure out where they are? How about how close they are? Then try it with both ears. More information is available here: <https://www.scientificamerican.com/article/bring-science-home-two-ears-sound/>

Explore Sound—Come up with your own activity where you experiment with sound, hearing, or music!



NEW! Fill out your order form and pay online.

Visit: <https://girlscoutsalaska.wufoo.com/forms/s9a25h91tymse/>

Paper forms, if needed, are available [here](#).

Iditarod Patch



Patch Requirements

Daisies and Brownies choose 3 activities; Juniors and up choose 4 activities

1. Explore Iditarod math with an activity from <http://iditarod.com/edu/category/math/>
2. Try out Iditarod science with an activity from <http://iditarod.com/edu/category/science/>
3. Discover Iditarod technology with an activity from <http://iditarod.com/edu/category/technology/>
4. Check out the geography of the trail with an activity at <http://iditarod.com/edu/category/social-studies/>
5. Build Iditarod character with an activity from <http://iditarod.com/edu/category/character-education/>
6. Get outside! Try out dogsledding, snowshoeing, skiing or another winter sport.

NEW! Fill out your order form and pay online.

Visit: <https://tinyurl.com/Iditarodpatch>

Paper forms, if needed, are available [here](#).

Thank you to:





Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your Oceans & Waterways Science Patch!

Take Action! —Take action and find a ocean front or waterway (like a lake, stream, river or creek) near you and do a clean up! Even if you live far away from an ocean, rivers can carry debris that entangle fresh and marine organisms. Sometimes, they can even mistake our trash for food. Gather folks from your community to take part in making our planet a better place! Learn more here: <http://www.greenhandsusa.com/eventguide/page:260>

Reduce, Reuse, Recycle— Did you know, most items in your garbage can be recycled? Do a waste audit to learn what things we throw away that can be reused or recycled! A waste audit is a comprehensive analysis of what we throw away in garbage cans. How many things in your trash can be recycled? Your school's? Learn more about waste audits here: <https://cleanriver.com/waste-audit-in-5-easy-steps/>

Stop Single Use Plastic— What are single use plastics? Single-use plastics, or disposable plastics, are used only once before they are thrown away or recycled. These items are things like plastic bags, straws, coffee stirrers, soda and water bottles and most food packaging. Think about how often you use single use plastics. How can you reduce usage of these plastics? Brainstorm ways to reduce single use plastic in your home, community or school! Learn more about single use plastic here: <http://www.plasticfreechallenge.org/what-is-single-use-plastic/>

The Value of Oceans & Waterways—Water is a source of life and is a powerful force that has shaped the land, rocks and even the Grand Canyon. Water can be frozen in ice cubes, or a giant glacier carving mountains! Water can be a small trickle or a raging river! What do you value about water? How does water inspire you? Create a song, poem, piece of art or story about the value of water. Be inspired here: https://www.huffingtonpost.com/wallace-j-nichols/the-true-value-of-healthy_b_9664554.html

Field Trip to a Water Source—Learn how water has shaped the land around you! Visit a glacier, river or lake to learn how that water source has changed (or is changing!) the land you live on. What animals rely on that water source? Where does the water come from? Has it always been that way? How do you use that water source? Find out and share your knowledge of that area with others!

Aquatic Food Chains—What is your favorite aquatic animal? How does it fit in the food chain under the water? What kind of watery habitat does your animal live in? Eat or be eaten in this fun activity! Design a food chain around an animal of your choosing. What foods does it eat? How does it get those foods? Draw it, build it, or act it out! Learn more about food chains here: <http://www.noaa.gov/resource-collections/aquatic-food-webs>

*Websites are just suggested resources. You may use other sources you find.



Alaskan Animals

Daisies and Brownies complete 3 activities, Juniors and up complete 4 to earn your



Alaskan Animals patch!



Animal Stories—Create a story choosing an Alaskan animal of your choice. This story can be written with pictures, a poem, drawing, a skit, or a piece of art. This story can be real or imaginary! Share it with your family, troop or community.

Life History—What is a life history? A life history is the series of changes an animal undergoes throughout its life span. What is your favorite animal's life history? Does it change shape or size? Does its diet change? Does it migrate? Create a poster, animation, comic, drawing, sculpture or flow chart on an animal of your choosing's life history. Explore and discover animals near you undergoing change. Observe bird's nests, tadpoles, or insect eggs and document their change over time.

Backyard Bioblitz—How many different species live in your backyard? You'll be surprised to know that there are a multitude of different bugs, birds, plants, fungi, and mammals that call your backyard home. Spend some time documenting the species you see in your backyard, park, or other place.

Home, Sweet Home—Everyone needs a home! Create a home for the animals that live near you. Construct a bird house, bat house, or an insect hotel to help out the animals in your back yard.

www.nwf.org/en/Garden-for-Wildlife/Cover/Build-a-Bat-House and www.naturallivingideas.com/bug-hotel/ are great resources to learn how to make bat houses and insect hotels.

Citizen Science—Contribute to real science with data you collect! Address real world issues by documenting the things that you see on a daily basis. Report bird sightings, tundra hares, bats, plants, frogs and toads, and ecological data to help scientists around the world. Here are some places you can submit data: www.nationalgeographic.org/idea/citizen-science-projects/ and www.ebird.org and www.adfg.alaska.gov/index.cfm?adfg=citizenscience.hareobservation and www.akherpsociety.org/citizenscience.htm

Traditional Values—Learn about the original peoples who live(d) on the land where you live. What is the original language? Yupik? Tlingit? Eyak? What are some of the traditional stories? Learn about a traditional story about an animal. These stories are tales of wonder and sometimes magic. They appeal to all ages and emphasize important values and traditions that are deeply important to the culture of origin.

Ecosystem Changes—Locate an ecosystem near you and document the changes that you see over three to four weeks. Observe a lake, forest, stream, field, ocean, or other ecosystem. What animals are there? What animals have left? Do the plants change? Temperature? Weather? Are any bugs hatching? Create a field guide and write down the changes you see.

