

# The STEAM Challenge Patch Program



Science, Technology, Engineering, Art and Math—otherwise known as STEAM—is all around us! It is a part of everything that we do every single day. The STEAM Challenge is all about beginning to explore STEAM in a fun and new way by trying different things. This challenge is a year-long adventure where each month you will complete a new activity of your choosing, centered around a different STEAM theme. You will have the chance to explore the STEAM in your own life, and the opportunity to dig a little deeper to understand why and how some of the things around us work!

**To earn the STEAM Challenge patch, complete the following three steps:**

1. Take the STEAM Pledge.
2. Make a difference in your community through STEAM.
3. Explore STEAM each month with a new activity.

After you have completed the STEAM Challenge patch program, you will be able to identify the STEAM you use in your daily life, learn new ways to use STEAM to help others, and continue to challenge yourself to try new STEAM activities when they arise!

# Take the STEAM Pledge

A pledge is a commitment or promise that you make to yourself and your community. The STEAM Pledge is a promise to continue exploring and experimenting no matter what obstacles you may face.

Read through the STEAM Pledge below and, if you agree, print out this page and sign it.

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## I pledge to be a lifelong learner of STEAM.

I will continue to look for the Science, Technology, Engineering, Art and Math that is within all the activities I do everyday.

I pledge to stay curious, to ask questions about how things work and why.

I will learn that each failed attempt I make at something will help lead me to a successful outcome and I will continue to try without being discouraged.

Finally, I pledge to always encourage others around me to continue exploring and experimenting with STEAM.

Signed,

Name (print): \_\_\_\_\_

Signature: \_\_\_\_\_

“Failure is a part of [the] process. You just learn to pick yourself up. And the quicker and more resilient you become, the better you are.”

– Michelle Obama,  
Former First Lady of  
the United States

# Make a Difference in Your Community with STEAM

Find a cause you are passionate about and help spread awareness and make change by using STEAM! Not sure what to choose just yet? Explore the monthly themes in the STEAM Challenge until you find something you want to take action on. This project can be done at any time during the year. For example:

- Are you passionate about pets? Have lots of homeless pets in your community? Consider hosting a supply drive or making pet blankets. Talk with a veterinarian or local animal shelter about the ways you can help.
- Worried about pollinators and love to garden? Discover some pollinator-friendly plants or other things that will help attract more pollinators to your neighborhood. Then find a space where you can plant pollinator-friendly plants or place a pollinator house.
- Help reduce, reuse, and recycle in a way that helps others and the planet! Host a clothing drive for a local shelter. Share with your community the importance of recycling materials, such as clothes, and the impact it can have to others and the environment by donating them instead of throwing them away.

## STEAM for Each Month of the Year

Challenge yourself to find and explore the STEAM in your life each month with the following prompts and activities. Use your resources wisely and reach out to a parent, teacher or online resources (be sure to take the [Girl Scout Internet Safety Pledge](#) first!) for help completing the activities. Be sure and document each experiment and activity, whether that's writing in a journal, sketching out your observations, or making art to share your findings! Be creative and choose something that motivates you to continue exploring STEAM. There are multiple suggested activities for each month—choose one from the list, create your own activity that fits the theme, or have extra fun and do them all!

1. November: STEM Month
2. December: The Science of Snow
3. January: Cookie Engineering
4. February: Awesome Animals
5. March: Female Leaders in STEAM
6. April: Branching Out
7. May: Food Magic
8. June: Feeling the Heat
9. July: The Energy in Movement
10. August: An Environment Adventure
11. September: The Changing Seasons
12. October: Sugar Sweet Experiments

## November: STEM Month

November is Girl Scouts of Oregon and Southwest Washington's STEM Month! Now is the time to explore STEAM with other Girl Scouts in our council and begin exploring STEAM careers! Choose one of the options below:



- Attend STEM Day or another council-sponsored STEAM event found in the GSOSW *Program Guide*!
- STEAM is in everything we do and is a part of every career. Interview a few of the adults in your life about what they do and see if together you can uncover the STEAM in their career.
- Think about yourself right now—what do you like to do, what are you passionate about, where do you like to spend your time? Now think about your future—where are you, what are you doing? Do some research online for what types of careers might pique your interest, and use the STEM Exploration badge to help you get started. Then, make a dream board to help visualize your future in STEAM!

## December: The Science of Snow

December is one of the chillier months here in Oregon and Southwest Washington, the perfect time to explore the snow and the cold! Choose one of the options below:



- Explore different freezing temperatures by making homemade ice cream.
- Discover the symmetry of snowflakes, do some research on the different types of symmetry and then make your own paper snowflakes.
- Take on an engineering challenge, go find some snow to play in and build some snow sculptures! Test out different ways of getting the snow to hold together and the ways you can construct a stable sculpture.

## January: Cookie Engineering

With January comes the start of Girl Scout Cookie season in Girl Scouts of Oregon and Southwest Washington! Choose one of the options below:



- Explore what sort of STEAM can be found in baking. Try experimenting with ingredients and amounts to see how they affect your end product. You could do this by taking on the Cookie Test!

### Cookie Test Instructions

- *Pick a simple recipe, like a chocolate chip cookie recipe.*
  - *Select a few of the ingredients you want to experiment with, such as baking powder vs baking soda, the consistency of butter, or the ratio of brown sugar to white sugar.*
  - *Write down the recipe that now includes the change you want to make. Do this for each change you want to make; each change will be its own recipe.*
    - *IMPORTANT: Only change one thing at a time in your recipe, and be sure to always make a “control” recipe as well—i.e. the original cookie recipe. This way, you’ll have a baseline to compare any changes to.*
  - *One recipe at a time, mix and bake your cookies. Don’t forget your control recipe!*
  - *Observe the different cookie doughs and baked cookies. Which one tasted best, had the best texture, was the most cookie-ish in color, flattened or rose most?*
  - *Look up some of the science behind each included ingredient. What do you think made each dough and cookie behave the way it did?*
- Bake your own gingerbread cookie and take on the engineering adventure of building a gingerbread house. Try out different recipes to see which one makes the best cookie for building vs eating. Don’t forget to decorate your house after it’s built!
  - Boxes, boxes and more boxes! Once Girl Scout Cookie season is over, what do you do with all those empty cases?! Try out an engineering challenge to build something! Challenge yourself to see how tall of a stack you can make. Can you build a structure you can fit in? Or could you use the cases to design something new, like a journal or bookshelf?



## February: Awesome Animals

February is all about animals! Choose one of the options below:

- Discover more about your favorite animal's habitat. You could watch a documentary about it, visit the zoo, or even a local park, depending on what animal you choose.
- Take a walk to find the STEAM in your neighborhood. See if you can find some different animals, insects, or plants and uncover the adaptations that make them special. After you have learned about them, draw what you saw! For example, a Phasmatodea, commonly known as a stick bug, has adapted to look like its environment. This is to help protect it from predators, the things that want to eat it!
- Learn what signs different animals leave behind and how to identify them, then take a hike and see what kinds of animal signs you find.



## March: Female Leaders in STEAM

Celebrate female leaders in science! Choose one of the options below:

- Discover someone in your community that is helping make the world a better place through STEAM, and interview them about how they are doing this. If you can't interview them, do some research to learn more about them. Then share what you've learned with others.
- Research someone in history who has been a trailblazer in their STEAM field. Share about the discoveries they made with others through an art project, by drawing a picture or making a collage!
- Get hands on with history. Find a trailblazer that did something you think was really amazing, then recreate it at home! For example, Dr. Mae Jemison was the first black woman in space. To celebrate her accomplishments, build your own bottle rocket and launch it!



## April: Branching Out

April showers bring May flowers, so now is the perfect time to start growing and checking out all the cool things about plants! Choose one of the options below:

- Plant your own seeds and see what sort of changes you can make to affect their growth. Try keeping one outside, one inside, one under bright light, and one in the dark. Write down your observations as your plants grow!
- Research plants that help local animals, such as how milkweed is beneficial for butterflies. Find places in your community where you can plant these beneficial plants or educate others on how they can plant them in their own space.
- Go visit a local garden. Talk with a gardener about what is being grown, or planned to be grown. Discover some of the different needs each plant has and how the gardener will take care of them.



## May: Food Magic

The kitchen is a great place to discover STEAM! Choose one of the options below:

- Make your own edible slime! Most slime recipes take chemicals that can be harsh on your skin and are not yummy or edible. Go online to find a slime recipe using items from your pantry like marshmallows, gelatin or corn syrup. Watch how these delicious ingredients can be transformed into fun!
- Experiment with sweet and savory foods, and how can you make a traditionally sweet treat savory or a savory dish sweet. Invite your friends or family to taste test your creation!
- Work on your engineering skills to protect an egg from a fall. Construct something to hold and transport your egg in this classic egg drop experiment. Then enjoy some delicious scrambled eggs!



## June: Feeling the Heat

As we approach fire season here in Oregon and Southwest Washington, it's important to know how to stay safe, and when and where we can build fires. Choose one of the options below:

- Uncover the science of fire and what three things a fire needs to survive. Discover multiple ways you can safely put out a fire. Then, look up when fire season is in your community, and [make a fire safety plan](#). If it's safe to do so, you can even build a fire to roast some s'mores!
- Build an edible fire to discover the different elements of a fire. Using pretzels, shredded coconut, Red Hots, Tootsie Rolls and more, create your own fiery snack to enjoy.
- Research how climate change is affecting temperatures around the world. How might this be affecting fires? Then create an art project to share what you learned with others.



## July: The Energy in Movement

It's time to take a look at the flow of energy! From how electricity moves to how potential energy is stored, take some time to uncover these exciting mysteries! Choose one of the options below:

- Follow the flow of energy by trying out the Lemon Battery Experiment. Create a circuit with a lemon, pennies, aluminum foil, and plastic-coated paper clips! Once you've gotten your lemon to work, see if there are other fruits or vegetables that might work the same. Take a few minutes to try out an orange, or a potato.
- Using popsicle sticks and other small household items, construct a catapult that can launch a marshmallow. Test out your catapult and make adjustments to help your marshmallow fly further or higher. After you have done this, take a minute to learn more about the potential and kinetic energy used to make your marshmallow fly!
- Put your hands to work with an engineering activity all about movement. Try building a cardboard marble maze or see about making a racing car with materials you have around the house.





## August: An Environmental Adventure

The summer is a great time to be outside, but while you're out there be sure to check out some of the STEAM that's around you! Choose one of the options below:



- On a nice, bright and hot day, use the sun to make yourself a snack. Discover more about radiant energy by building a solar oven!
- Explore a local body of water! Bring a net and see what little or big creatures you can find (be sure to handle them gently, and release them back where you found them). Look up and try to identify what you find. Draw a picture of your favorite thing from today.
- Build a bird feeder or bird house out of recycled materials to put up in your community. Sit quietly and observe your feeder or house over a few days to see who might come to check it out. Try to identify the types of birds that come to visit.

## September: The Changing Seasons

September is a time of change, from the leaves changing color to having to go back to school, it's time to take a deeper look at some of the changes! Choose one of the options below:



- Go for a walk and observe some of the differences you can see in the plants and animals in your community and how they have changed in the past months to now. Journal about your observations and share them with others, see if together you can come up with more. Looking for a place to observe some of these fall changes? Check out a local state park during Girl Scouts Love State Parks Weekend!
- Learn how different animals survive the changing seasons and the cold. Go online to check out the polar bear blubber experiment to discover how fat keeps animals warm.
- Make your own art with the fall colors! Try using natural materials to dye your own fabric. Things like beets, spinach, walnut husks, and turmeric are some items you might start with. You can then use your fabric to sew something, like an apron—check out the Science of Sewing patch to learn how!

## October: Sugar Sweet Experiments

What a great time to explore the STEAM of candy! Choose one of the options below:

- Do your own sugar experiment by growing your own rock candy! Once you have mastered the basic recipe try adding flavors or using different types of sugar to see what happens.
- Try out making your own caramel! Watch how heat and water can transform sugar into ooey gooey delicious caramel. Look online to find recipes in order to try out the wet method and the dry method.
- Get microscopic and recreate a plant or animal cell out of candy! After you have made all the different parts of the cell, enjoy your tasty treat.



## Congratulations!

When you've completed the following steps, you have earned your STEAM Challenge patch!

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**Ready to purchase your patch?** Visit or call your nearest GSOSW Girl Scout shop to pick one up (Note: Patch is not available for purchase online)! For Girl Scout shop hours and locations, visit [.girlscoutsosw.org/shop](https://girlscoutsosw.org/shop).