



Penguin Patch

Learn all about penguins to earn your Persevering Penguins Patch.  
Daisies and Brownies complete 3 activities. Juniors and up complete 4.

**Meet a Penguin:** Travel virtually to the San Diego and get the inside story on African penguins. Join Girl Scouts of Alaska over Zoom on Saturday, October 16th. Visit [www.girlscoutsalaska.org/events](http://www.girlscoutsalaska.org/events) to register.

**Penguin Cam:** Watch the Macaroni and Gentoo Penguins of the Pittsburgh Zoo. <https://www.pittsburghzoo.org/penguin-webcam/>. Use the Q&A section to learn 3 new fun facts and teach them to a friend or family member. You can also use the New England Aquarium Penguin guide for more information about penguins: <https://tinyurl.com/neapenguinuide>

**Penguin Perseverance:** Every year emperor penguins travel up to 70 miles from sea to their breeding grounds and make the trip multiple times to feed their young. They encounter uneven ice with sharp edges and many other challenges along the way, yet they keep going. They might have to find another route, but they don't give up. Find something you are passionate about and make a plan to keep working on it even when it gets hard. You may decide to set a goal for the Girl Scout Fall Product Program, work on learning a new skill like knitting, or try something out of your comfort zone like hiking or camping. When it gets hard, remember to persevere like a penguin.

**Painting Penguins:** Painting is one way that zoo keepers provide enrichment for their penguins. Learn more about why penguins paint here: <https://www.youtube.com/watch?v=HNk1JGY6Fxi> Then try your hand at painting a penguin using one of the tutorials below or your own creative design!

Recommended for Daisies and Brownies: <https://www.youtube.com/watch?v=5-2qJX64384>

Recommended for Juniors and up: <https://www.youtube.com/watch?v=ww0AlruijX0>

**Penguin Diversity:** There are 17 different penguin species. They range in size from the 12 inch tall little blue penguin to the 44 inch tall emperor penguin. Many have unique features like the macaroni penguin or yellow-eyed penguin. Choose one penguin type to learn more about. Then make a drawing, poster, webpage, or other visual to share your new knowledge with others.

**Penguin Careers:** Have you ever thought about working with animals like penguins for a career? Check out some of these videos to learn more about careers where you might work with penguins.



Georgia Aquarium Veterinarian— <https://www.youtube.com/watch?v=JCy-pFzUMBo>

Penguin Keeper— <https://www.youtube.com/watch?v=HFqIRrCIBu8>

Antarctic Researcher— <https://www.youtube.com/watch?v=VPUetsnURVk>

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# Penguin Patch



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Daisies and Brownies complete 3 activities. Juniors and up complete 4.

**Penguin Curiosity:** When the Shedd Aquarium closed to visitors, the penguins began to adventure. Watch them explore and see their curiosity as they visit sea otters, amazon animals, and more! <https://tinyurl.com/penguinseaotter> and <https://tinyurl.com/penguinamazon>. Use your curiosity to explore a place new to you. Bonus: Spend some time walking like a penguin as you explore!

**Penguin Snacks:** Humans can taste sweet, sour, bitter, salty and umami. Penguins can only taste sour and salty. Read more about it here: <https://tinyurl.com/penguintaste>. Fish is their primary food source, but some species also eat krill, squid, or other sea creatures. Try one of the following:

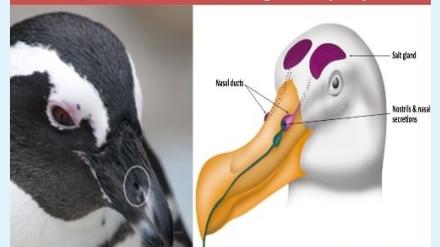
- Try a new sour or salty snack that a penguin would be able to taste
- Go fishing!
- Experiment with a new fish or seafood recipe
- Make a penguin inspired snack like these penguin crackers or try your own recipe <https://tinyurl.com/penguinsnack>

**Penguin Feathers:** Penguins can spend up to 75% of their time in the water. Have you ever spent too long in a bathtub or pool and come out wrinkly? How do penguins avoid the wrinkles and stay dry? Their feathers are covered in wax. To see how it works, color in the penguin coloring page with wax crayons. You want to get a nice thick coat with no blank spots just like a penguin. Now comes the experiment. Take some water and drip some carefully onto your penguin. What happens?

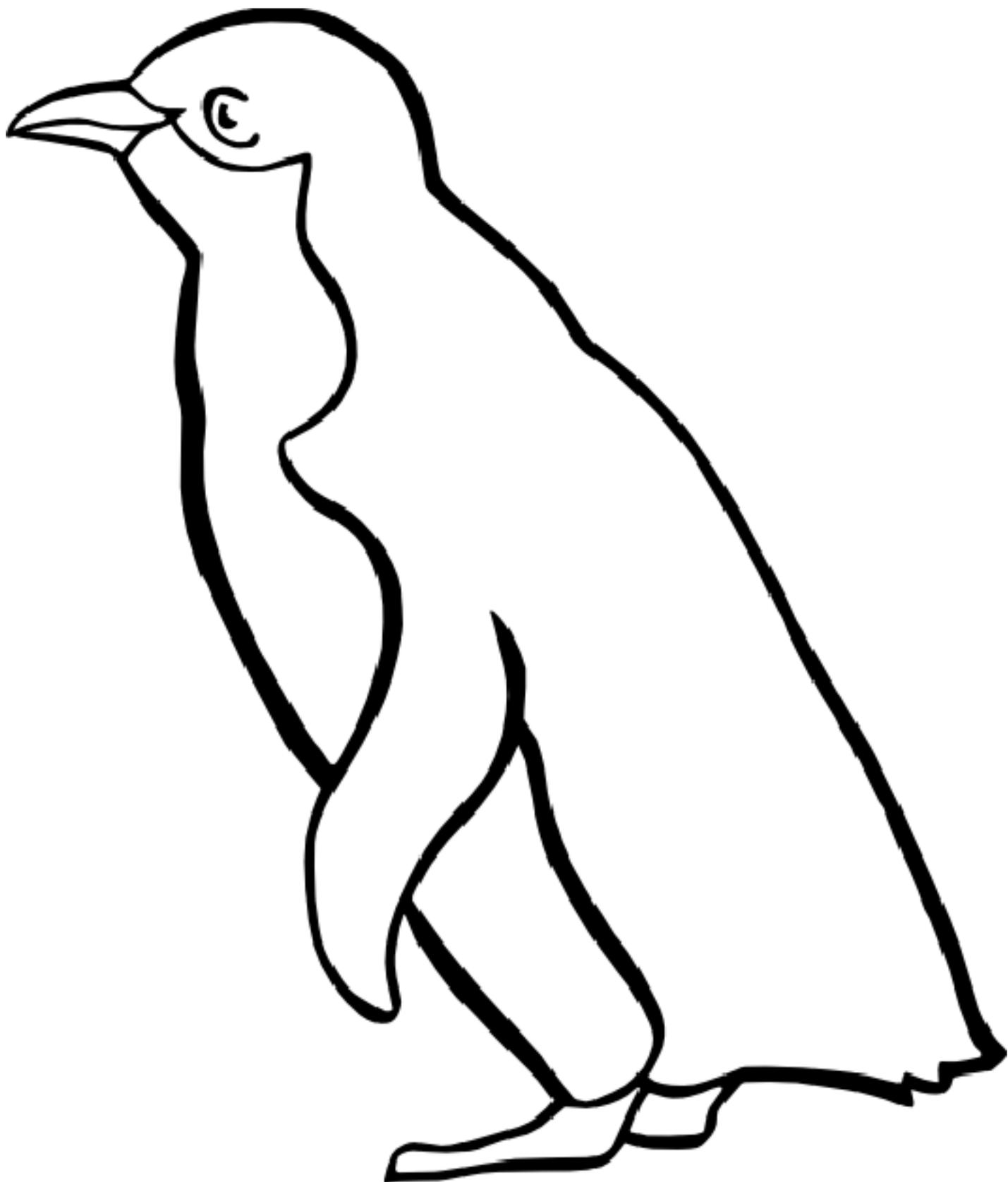
**Penguin Salt Sneezes:** Penguins can drink sea (salt) water! Don't try it yourself since you will get dehydrated, but penguins have special salt glands near their eyes to filter out salt. After they drink salt water or eat salty fish, they get the salt sneezes and shake their heads. Watch it here: <https://www.neaq.org/blog/salt-sneezes-thing/> or <https://tinyurl.com/saltsneeze>.

Find out how much salt is in the seawater by doing an experiment. First collect a sample of ocean water with the supervision of an adult. Cover a baking sheet with black construction paper. Pour your ocean water into the tray so it covers the paper completely. Leave it to sit somewhere relatively warm. Record your observations over the next few days.

Penguins, and other marine birds, have a supraorbital gland that filters salt from their bloodstream, allowing them to ingest salt water when catching their prey.



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



# The Night Sky



Learn all about auroras, stars, and the moon as you to earn your Night Sky Patch. Daisies and Brownies complete 3 activities. Juniors and up complete 4.

**Aurora Virtual Event:** Join Museum of the North Aurora Educators on November 18th 2021, to learn about Aurora and complete a fun aurora craft together! Visit [www.girlscoutsalaska.org/events](http://www.girlscoutsalaska.org/events) for more information and to register. Can't watch live? Watch the Museum of the North's short video "Discover the Northern Lights and try one of their activities. <https://tinyurl.com/DiscoverNorthernLights>

**Aurora Stories:** People living in northern regions (Alaska, Canada, Norway and more) have been watching the aurora for thousands of years. Just like people told stories of the constellations in the stars, people told and passed down stories of the aurora. Some Inuit groups saw the lights as the spirits of the animals they had hunted, namely beluga whales, seals, salmon and deer. Read a story about the aurora borealis and then tell your own story. Below are a couple of options or visit the library and find one you like.

[Aurora: A tale of the Northern Lights](#) by Mindy Dwyer

[Sky Sisters](#) by Jan Bourdeau Waboose

**Colors of the Aurora:** Learn about the colors of the aurora and try your hand at an aurora ice painting with this activity from the Museum of the North. <https://tinyurl.com/paintaurora>

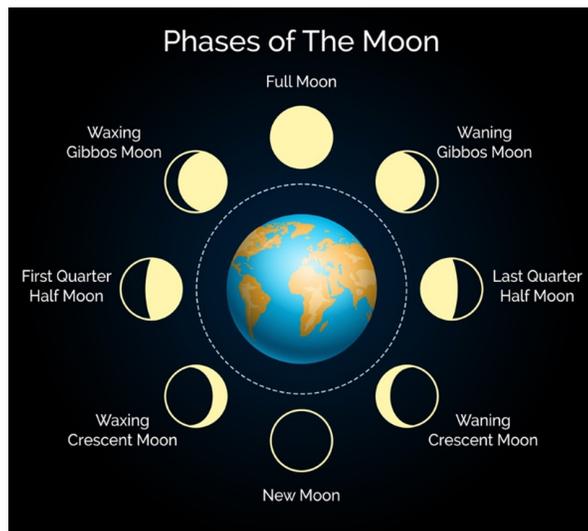
**Aurora Facts:** Print out your own aurora borealis booklet from Beyond Polar Bears and Penguins with fun facts about the aurora. <https://tinyurl.com/aurorabooklet>. Then share your book with a friend or family member. Find one fact that is new to both of you and share something that surprised you.



**Forecasting Aurora:** Use the University of Alaska Fairbanks Geophysical Institute to answer some of these questions about Aurora. Share what you learned with a family member or friend.

- Can you predict the aurora?
- When is the aurora most visible?
- What are KP numbers?
- When is the next time seeing the aurora will be likely in your area?

# The Night Sky



Order your patches online here:

<https://www.cognitofirms.com/Girlscoutsalaska/GSAKPatchOrderForm>

**Virtual Navigation Event:** Join Bishop Museum educators November 4th 2021, from Hawaii for this virtual program exploring traditional Polynesian navigation and traditional wayfinding. Visit [www.girlscoutsalaska.org/events](http://www.girlscoutsalaska.org/events) for more information and to register.

**Observe the Moon:** Learn about the moon phases with this video and moon journal from the NASA Jet Propulsion Laboratory. <https://www.jpl.nasa.gov/edu/learn/project/look-at-the-moon/>

**Meteor Shower:** The Taurid Meteor shower is predicted to peak around November 4-5th, 2021 but can be visible from October to December. Pack a hot drink, some warm blankets, and find a dark place to view the sky looking for meteors. Find out more about meteors and how to best see them on the "In the Sky" website here: [https://in-the-sky.org/news.php?id=2021112\\_10\\_100](https://in-the-sky.org/news.php?id=2021112_10_100)

**Astronomer Action:** Constellations have stories and myths behind them, but they also have science applications. They help scientists identify particular stars and observe their motion. Make your own star chart and use it while star gazing. Notice you have to set it to the correct time. What happens to the stars throughout the night? <https://tinyurl.com/AKstarwheel> You can also use your technology resources and try out the Sky View app.

**Light Pollution:** Light pollution affects many things from the mating of frogs to sleep patterns in humans to astronomer's ability to study galaxies. Learn more about light pollution from National Geographic here: <https://www.nationalgeographic.org/article/light-pollution/3rd-grade/>. What does the earth look like at night from space? View Google Earth at Night to see. How does your home location compare to other parts of the world? <https://tinyurl.com/googleearthatnight>. Next try it at home. Use a piece of black construction paper and poke a few holes in it. Tape your paper over a flashlight and shine it at the ceiling of a dark room. You should see small dots of "stars." Slowly add light by opening a curtain or turning on a lamp or flashlight. How does the light affect your ability to see the stars? For more directions visit: <https://tinyurl.com/lightpollutionactivity>

# Koalas



Learn all about koalas as you earn your Keen Koala Patch.  
Daisies and Brownies complete 3 activities. Juniors to Ambassadors complete 4.

**Koala Virtual Event (Jan 19, 2022):** Come on a live virtual tour looking for koalas in the wild of Australia with a local guide, environmental scientist and koala whisper. She will take you via zoom to wild koala habitat and will search for wild koalas. On the way she will discuss their biology, habitat and their threats. Visit [www.girlscoutsalaska.org/events](http://www.girlscoutsalaska.org/events) for more information and to register.

**Koalas 101:** Visit the National Geographic website to learn about their 6 “thumbs,” sleep habits, and quickly disappearing habitat. <https://www.nationalgeographic.com/animals/mammals/facts/koala>

**Kiana the Koala:** Meet the 2022 cookie mascot, Kiana the Koala. Visit the Little Brownie Baker page to learn koala facts, test your knowledge with a koala quiz, and print a koala coloring page. <https://tinyurl.com/KianaKoala>. To learn more about the Girl Scout Cookie Program, visit <https://tinyurl.com/GSAKcookies> or e-mail [customercare@girlscoutsalaska.org](mailto:customercare@girlscoutsalaska.org) and we will help you get started.

**Koala Craft:** Practice your sewing skills, by making your own felt koala plushie with these simple step by step instructions: <https://tinyurl.com/koalacraft>. Once you earn your Koala patch you can sew that to your uniform too!

**Koala Thumbs:** Touch your thumbs to each finger on the same hand. Did you know many animals can't do this? They don't have opposable thumbs. Koalas not only have opposable thumbs, they have two on each hand! This allows them to grip onto trees better. What do your thumbs do for you? Try taping you thumbs to your hand so you can't use them and then try an everyday task like getting dressed, eating a meal, or completing one of the other koala patch activities. What did you learn about the importance of thumbs?



# Koalas



Order your patches online here:

<https://www.cognitofrms.com/Girlscoutsalaska/GSAKPatchOrderForm>

**Koala Sleep:** Koalas sleep about 18 hours per day. How much do you sleep? What about other animals? Do some research and find out how many hours per day at least 5 different animals sleep. Make a bar graph to show your findings. Were you surprised at all?

**Koala Bears?** Koalas are not really bears at all but they are marsupials. Find out more about marsupials by going to the library and reading a book or doing some research online. “Don’t call me Bear!” by Aaron Blabey is a great book to start with.

**Help the Koalas:** Koalas are currently listed as vulnerable, but there is research suggesting they should be listed as endangered as their populations decline mostly due to habitat loss. Learn more about the issues facing koalas in Australia and some ways you can help by visiting the Australian Koala Foundation website:

<https://www.savethekoala.com/>

**Climb like Koalas:** Go on a hike and climb to the top of a hill, try climbing at a rock gym, or climb your own mountain by setting a goal and working hard toward it. Make sure to check out the Safety Activity Checkpoints for hiking and climbing. <https://www.girlscoutsalaska.org/en/for-volunteers/VolunteerEssentials/Safety.html>



# The Summer of SUDOKU Challenge

## Patch Series

Learn the fun game of Sudoku while trying new science, technology, engineering, or math (STEM) activities, exploring the outdoors and nature, and pushing yourself to grow in new ways. Solve the Sudoku puzzle to figure out how many times you must complete each activity. Share photos of yourself doing one of the activities with

#GSAKsummerSUDOKUchallenge and tag Girl Scouts of Alaska.

Complete 8 activities from each Sudoku board to earn both halves in this special patch series.



Order your patch here:

<https://www.cognitofrms.com/Girlscoutsalaska/GSAKPatchOrderForm>

## What is SUDOKU?

# History

The history of Sudoku begins in 1783 when the incredibly influential mathematician Leonhard Euler devised 'Latin Squares'. This was a pattern for organizing numbers in a grid so that every number or symbol appeared once in each row or column. This was the core concept that would influence Howard Garns, a freelance puzzle inventor from Connersville, Indiana, USA to develop the modern game of Sudoku in 1979 under the name of "Number Place".

However, the game was not initially successful. It wasn't until 1984 when the number game debuted in Japan that it gained critical acclaim. The game was renamed "Sudoku," short for "Sūji wa dokushin ni kagiru". This phrase translates in English as, "Numbers are limited to singles" where "dokushin" means an "unmarried person". But why was Sudoku so popular in Japan but not in the United States? One possible reason is that the Japanese language doesn't work very well with crossword puzzles – so a number puzzle was much more accessible.

Sudoku's immense popularity would eventually spread back to the United States in the 2000's. *The Conway Daily Sun* in New Hampshire began producing Sudoku puzzles in their weekly newspapers in 2004, and in doing so began the rapid rise of Sudoku from relative obscurity.

Today, Sudoku is a global sensation with numerous variations for any skill level. However, present research shows that solving sudoku isn't just fun but also great exercise for the brain. A study by Dr. Nicola Ferreira in 2015 supports that the routine solving of such number puzzles correlates with improved brain function in aging populations. It has even been suggested consistent practice of Sudoku can slow the progression of conditions such as Alzheimer's.

Smith, David (May 15, 2005). "So you thought Sudoku came from the Land of the Rising Sun ..." *The Observer*.

Ksander, Y. (2007, May).

Hoosier Puzzlemaster I. Indiana Public Media. Retrieved from <https://indianapublicmedia.org/momentofindianahistory/hoosier-puzzlemaster-i/>

Ferreira, Nicola; Owen, Adrian; Mohan, Anita; Corbett, Anne; Ballard, Clive (2015). Associations between cognitively stimulating leisure activities, cognitive function and age-related cognitive decline. *International Journal of Geriatric Psychiatry*, 30(4), 422–430. doi:10.1002/gps.4155

## How to play

A Sudoku puzzle is traditionally a 9x9 grid, however the rules are essentially the same for the 6x6 grids we will be solving in this activity.

The main rule to remember is that each number (1-6) can only appear once in each row, column, or outlined rectangle (sometimes called a block). Therefore, upon completion...

1. Each row should contain only the digits from 1 to 6, no repeats.
2. Each column should contain only the digits from 1 to 6, no repeats.
3. Each block should contain only the digits from 1 to 6, no repeats.

You can use this fact to reason which numbers belong in the blank spaces of the puzzle.

## Tips and Tricks

- To start with a sudoku game, search for rows, columns or block with only a few digits missing.
- Start with the digit that is already often filled in the puzzle.
- If you manage to fill a certain digit, try to look whether you can fill that digit somewhere else.

## Example

Here is an example of a 6x6-grid. Can you replace the “?” with a digit?

3	4	5	1		
6		?		5	4
			4	3	5
5	3	4	2	6	
1					2
	5	2	6	1	3

Sudoku rule 3 states that you cannot use any digit twice in a block. Since you already have 3,4,5, and 6, the “?” can be either the digits 1 or 2. Sudoku rule 2 states that you cannot use any digit twice in a column. However, you can see digit 2 at the bottom of the column. It means that in the box with “?” can be used only digit 1.

3	4	5	1		
6	?	1		5	4
			4	3	5
5	3	4	2	6	
1					2
	5	2	6	1	3

Sudoku rule 3 states that also in each block each digit can be used only once. You can use this rule here to fill the second “?”. It is the digit 2.

# The Summer of SUDOKU



Solve the Sudoku puzzle first to fill in the blanks of each activity!

<b>Growth Mindset</b> How fast can you complete a mile or 5K run/walk? Practice ___ times and try to improve your time.	<b>Animal Action</b> Choose ___ endangered or threatened animals of your choice. Research and find out how you can help. Take action!	3	<b>Possibilities Playlist</b> Create a list of at least ___ songs that make you feel good. Play it when you get stuck on a BINGO challenge.	1	<b>Bug Hunt</b> Turn over logs, dig in the dirt, and explore in the garden to find ___ different insects or bugs.
5	6	<b>Girl Scout Camp</b> Participate in GSAK Camp at least ___ time	3	2	<b>Kindness</b> Spread kindness in your community in ___ different ways.
<b>Author/Illustrator</b> Write and illustrate ___ book. Have a book reading/signing!	5	4	2	<b>Coastal Creatures</b> Check out what lives in the intertidal zone. Make a list of at least ___ creatures you find. <i>Check with an adult to be safe near the ocean.</i>	3
2	<b>Poem Challenge</b> Write ___ poems and perform it for friends or family.	6	4	5	1
<b>Origami</b> Make a ___ origami creations. Choose something that is challenging for you or make up your own.	1	2	<b>Communication</b> Choose ___ of your favorite words to learn in a foreign language or even sign language.	4	5
<b>Left or Right</b> Learn to write your name with your nondominant hand. Keep practicing ___ times!	4	<b>Outdoor Art</b> Take your creativity outside and draw, paint, bead, or do another craft in the sunshine or shade using at least ___ different materials.	1	<b>Prepare</b> Learn and practice ___ new first aid skills. Make a poster to show the steps of each skill.	<b>Map Making</b> Go on a walk or hike. Make a map showing where you went. Include ___ important landmarks on your map.

# The Summer of SUDOKU



Solve the Sudoku puzzle first to fill in the blanks of each activity!

6	4	<b>New is Cool</b> (and sometimes hard) Try ___ things that are brand new to you!	2	<b>Minute Physics</b> Watch ___ videos from the minutephysics channel on YouTube. <a href="https://tinyurl.com/GS AKminutephysics">https://tinyurl.com/GS AKminutephysics</a>	<b>Catapult!</b> Build ___ catapult and test it out. <a href="https://tinyurl.com/GS AKcatapult22">https://tinyurl.com/GS AKcatapult22</a>
<b>STEM Challenge</b> Build something that can fly or glide for at least 5 seconds. 10 seconds or more? Try ___ different designs.	5	1	<b>Hour of Code</b> Try an hour of code activity ___ times <a href="https://hourofcode.com/us/learn">https://hourofcode.com/us/learn</a>	<b>Fast Facts</b> Choose a topic you are interested in and learn ___ new facts. Exchange facts with a friend	<b>Zoology</b> Check out your ___ favorite animals on a zoo webcam
3	6	4	<b>Watch it Grow</b> Plant ___ different seeds and record the differences as they grow.	<b>Oobleck</b> Mix equal parts water and cornstarch to make Oobleck. Record its unique properties.	2
5	<b>Budget</b> Make a budget for ___ family meal, short outing, or other activity. Follow through and stick to the budget!	<b>Earn Badges</b> Earn ___ GSUSA STEM Badges for your age level. Look for new ones in Summer 2022.	4	3	6
<b>Light up</b> Make your own circuit. Create ___ card, poster or other craft. <a href="https://tinyurl.com/gsakcircuitcard">https://tinyurl.com/gsakcircuitcard</a>	<b>Speedy Fun</b> Calculate how fast you can run, skip, or hop. Measure out a distance. Time yourself. Speed = distance ÷ time. Do this ___ times.	5	6	4	<b>Sink or Float</b> Explore density by testing ___ different objects to see if they sink or float. Then build a raft that will hold a small toy.
4	<b>STEM in Action</b> Identify ___ problems at home or in your community. Use recycled materials to build a solution to one.	6	<b>Business Boss</b> Take charge and start ___ business. You could try the classic lemonade stand or put your unique talents to work.	2	5