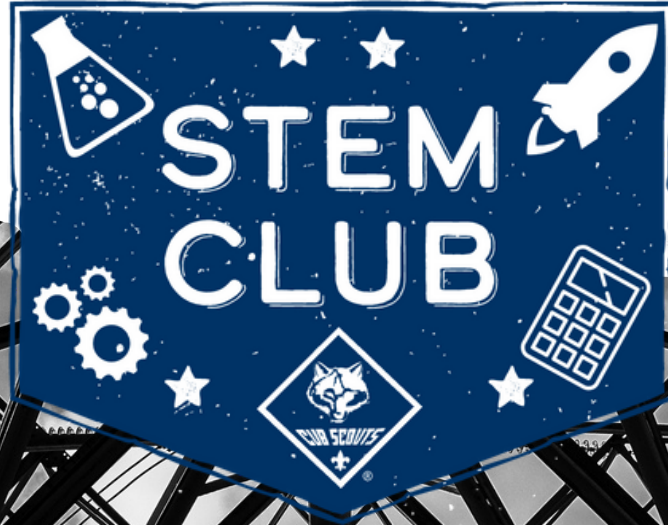


LEADER

CUB SCOUT MEETING GUIDE



WEEK 7

FEARFUL SYMMETRY

PRE-MEETING EMAIL

SEND 1 WEEK PRIOR + A REMINDER DAY OF:

Pack (enter #) Families,

Our next meeting is (enter date) at (enter time). Please log-in using this Zoom Code (enter zoom code). I, (enter name), will be the meeting host. Our meeting theme is Uncovering the Past! We will be making a Hot Dog Mummy. Please ensure scouts have the following materials ready to use during our meeting:

- Paper
- Paint (3-5 Colors)
- Paintbrush

Fearful symmetry is all about symmetry in nature. We'll look at what symmetry actually is, and we'll also look at three different types of symmetry: rotational, reflectional and translational symmetry. Our project this week will focus on reflectional symmetry in art and is a lot of fun.

See you at our meeting,

(Your Name)

ZOOM MEETING TIPS

WHEN SETTING UP YOUR MEETING:

- Prior to meeting:
 - Set up your meeting and email meeting code, only email to those in your Cub Scout Pack, set up a new meeting in Zoom for each meeting, so there is a new secure code
 - Pre-assign other adults to help as co-hosts, ask them to do specific tasks (monitor chat room, help present w/assigned slides)
 - Take a look at the slide deck and script before the meeting. Read through it once or twice and think about questions your den may ask. You know them best!
- In settings turn off:
 - Annotation (prevents Scouts from writing on screen)
- At beginning of meeting
 - Mute everyone and select "do not let participants unmute themselves"
 - Make additional adults co-hosts
 - Give scouts basic chat courtesy rules: Use it only for questions and on topic conversation. Don't type your response over and over - this makes it hard to see what your friends are saying!
 - You can keep the chat open, but likely you will want to close the chat to "host only", the Scouts tend to spam the chat

MEETING SPECIFIC RESOURCES

ART LINK FOR EXAMPLE: <https://youtu.be/EJ4sgKCnD5A>

SLIDE DECK SCRIPT

SLIDE 1

Welcome to our Cub Scout Meeting! We will start at (enter time). This week, we will be highlighting the Fearful Symmetry Cub Scout NOVA Award. NOVA Awards are something fun that Cub Scouts can earn by studying various fields of STEM. STEM stands for Science, Technology, Engineering and Math. Each week we will focus on something new.

We will not be completing the NOVA awards with these meetings, they are meant to be a fun introduction!

SLIDE 2

Fearful symmetry is all about symmetry in nature. We'll look at what symmetry actually is, and we'll also look at three different types of symmetry: rotational, reflectional and translational symmetry. We'll explore what each of those 3 types of symmetry are, and we'll look at a few real world examples as well.

Finally we will learn about the difference in symmetry between a geranium and a periwinkle flower and close our meeting with a look at bilateral symmetry.

Our project this week will focus on reflectional symmetry in art and is a lot of fun.

SLIDE 3

Symmetry is something for which most people have an intuitive feel, but many have never thought about in enough detail to give names to all that they see. We all see symmetry every single day. by the time we finish this meeting, you'll be able to find symmetry all over the place.

Symmetry is a way that a figure is like itself. Perhaps one side is a mirror image of the other (reflectional symmetry). <PLAY VIDEO>

SLIDE DECK SCRIPT

SLIDE 4

Rotational symmetry happens when you can turn an image a certain amount and get the same pattern. The recycling logo is a common example of rotational symmetry, and so are stars. With the recycling symbol, every time you rotate it 120 degrees, it makes the same pattern again. And with the star, every time you rotate it 72 degrees, it makes the same pattern again. The number of times a shape can rotate and have the same pattern is called its "order of rotation." For example, the recycling symbol has an order of rotation of 3. Meaning there are 3 amounts you can turn it to get the same shape.

A circle is exactly the same no matter how much you turn it, so it has an infinite order of rotation.

Slide 5

Translational symmetry is caused by a repeated pattern along a line, and if you move space down the pattern repeats.

A good example of translational symmetry would be if I took a stamp and a piece of paper, and starting on the top corner of the paper, put a stamp, then moved over 1 inch and stamped the paper again, then moved over another inch and stamped again, and so on. The stamp would have translational symmetry across the piece of paper. Of course, some things have a combination of these.

A common example is when a pattern repeats as you move down a line and also reflects across that line. This happens with alternating leaf arrangement on a plant and is called glide reflection symmetry. There are far more patterns of symmetry than there are names for them.

Symmetry is everywhere. Minerals organize themselves in crystals, which have repeating patterns. Plants and animals have many interesting symmetries in their shapes. Most artistic traditions in the world, and many activities where people design a shape for its function, depend on some form of symmetry.

SLIDE DECK SCRIPT

Slide 6

Now, let's look at the difference between the symmetry of the flower of a geranium and the symmetry of the flower of herbaceous periwinkle. As you can see from this photo, Each petal of a geranium flower has a line of symmetry along its length. If you folded it in half at any of those points it would show that you a geranium has reflectional symmetry.

Now, take a look at the Periwinkle photo. These petals do not have reflectional symmetry because one corner is longer than the other. Consequently, the periwinkle flower has only rotational symmetries (rotate the flower so that one petal moves to where the next one was), while the geranium flower has symmetry along a line through the length of one petal and between two petals on the other side.

SLIDE 7

Ask scouts to get their supplies for the activity. Review the art lesson in the video and lead scouts in creating art pieces.

Suggested to start with simple dots before moving on to a shape like butterfly or hearts.

VIDEO EXAMPLE - <https://youtu.be/EJ4sgKCnD5A>

SLIDE DECK SCRIPT

SLIDE 8

Bilateral Symmetry is a type of reflectional symmetry, and is found in many animals. Specifically, animals that move a lot.

Bilateral symmetry means that if you were to split the animal down the middle, the two halves of the animal would look the same. Or at least very close to the same. Bilateral symmetry isn't perfect in animals, but it is close enough. For example, looking at an animal with bilateral symmetry, on the outside they would have symmetry if you split them in half. The left and right sides would look like reflections of each other. But inside, their organs would not have that symmetry. This is one way that bilateral symmetry isn't perfect in animals. These animals are still considered to have bilateral symmetry though.

SLIDE 9

Animals with bilateral symmetry generally have their mouth, eyes, and other sensory organs (like ears and noses) grouped together at one area of their body. You might have heard of something like this before. It's called a head.

Having a head means that these animals have a "front" and a "back of their body. With the head usually being at the front. For animals, this is especially helpful because, with the head at the front of the body, their nose is ahead of everything else and can smell stuff really easily, and their mouth is up front to defend themselves, or eat any food that they come across.

Having the head at the front of the body also makes it so that fish fins can be placed in a way that they are most efficient, bird wings can grow so that they are as aerodynamic as possible, and legs can grow in the best way for the animals to walk.

SLIDE DECK SCRIPT

SLIDE 9 (CONTINUED)

Having the head at the front of the body also makes it so that fish fins can be placed in a way that they are most efficient, bird wings can grow so that they are as aerodynamic as possible, and legs can grow in the best way for the animals to walk.

So, as a wrap-up, bilaterally symmetrical animals have a head with most of their sensory organs grouped on the head. They are mobile creatures, which means they move around a lot during their lives, and don't tend to stay in one place.

SLIDE 10

Now, let's look at three examples of bilateral symmetry, and why each one is important.

Sharks: Sharks are our first example of an animal with bilateral symmetry. With their head at one end of the body, the shark will always move in a way that has their head in front. This makes it so the shark can follow scents in the water easier, and when it finds food, the first thing that will get to the food is the shark's mouth. Since it moves head first its whole life, the shark's fins will get shaped in a way that will help the shark move the fastest and with the least effort possible. They will also grow in a way so that the shark can turn quickly and be as agile as possible.

Foxes: similar to a shark, with their head up front, they can put their nose down and smell for food or other animals, and with all four legs behind them, they can continue to move forward while moving their head up and down to smell and look at things around them while they are walking without worrying about falling over. The head being at the front also makes it so that the fox can poke its head out of bushes and look around without exposing its entire body.

SLIDE DECK SCRIPT

SLIDE 10 (Continued)

Humans: Humans are also an example of bilateral symmetry. Bilateral symmetry makes it so we can balance on two legs, and it makes it easier for our body to form a more complex nervous system, and better ability for directional movement. It also makes it a lot easier to make clothes and other things we wear every day that we take for granted. Imagine if we didn't have bilateral symmetry. We could have one arm where it normally is, and one coming straight out of your stomach, or you could have one eye where it normally is, and the other in the middle of your forehead. That would make getting clothing and glasses a lot more difficult. And if humans had no bilateral symmetry, then it's possible that humans would all look different, and have different body parts in different places. That would make getting clothes that fit even harder, not to mention that if we had no bilateral symmetry, one side of our body could be a lot heavier than the other, making it a lot harder to balance or walk on two legs.

SLIDE 11

Thanks for joining us for another great week of the STEM Club! On the screen now is everything we covered during the meeting for the Fearful Symmetry



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