



# Teaching STEM in the Great Outdoors: Symmetry Scavenger Hunt

For younger students, building real-world connections to math is key to paving the way towards continued future math interests as each learner develops! So, how do you build these lifelong math connections?

The answer is simple. **Take a walk.** In nature, everywhere you look, you can find math. You just need to know how to look for it!

One of the hardest things for students in a math classroom to do is apply what they're learning to real-world situations. From proofs to Pythagorion, finding applications for math outside of the classroom is not only difficult, but it's an incredibly important step in establishing student understanding as to why math is pivotal to a well-rounded education. Which is exactly why we've developed the Symmetry Scavenger Hunt! Are you ready to get your students learning through hands-on exploration?

Let's get started!



## HANDS-ON STEM EDUCATION

For over 30 years, PCS Edventures has inspired students to develop a passion for Science, Technology, Engineering and Mathematics (STEM), focusing our efforts on making learning and discovery a fun and interactive process for grades K-12.

- Classroom
- After-School
- Home Learning

**Before heading outside for this real-world math activity, lead your learners in a quick discussion to get their geometry gears turning.**

Use these discussion questions to help stimulate conversation:

- **What is symmetry? What does it mean to be symmetrical?**  
(*“Mathematically, symmetry means that one shape becomes exactly like another when you move it in some way: turn, flip or slide. For two objects to be symmetrical, they must be the same size and shape, with one object having a different orientation from the first. There can also be symmetry in one object, such as a face. If you draw a line of symmetry down the center of your face, you can see that the left side is a mirror image of the right side”* (Beddoe).)
- **Can you find something symmetrical in the room?**
- **Are there different types of symmetry?** (Yes! Objects can be asymmetrical, have reflectional, translational, rotational and a whole bunch of other mathematical symmetries!)



**Now, pose a challenge for students.** As a group, you will all be heading outside. It’s the students’ job to find as many types of symmetry in nature as possible. Either have learners work by themselves or in groups, and devise a way for them to keep track of the types of symmetry they’ve found. (*An easy way is for each learner to record their findings in a field journal/notebook.*)

Before moving outdoors, do a quick review of the types of symmetries students should be looking for:

Types of symmetry:

**REFLECTIONAL:** where one half of an image is exactly like the other half. (Exp: butterfly.)

**ROTATIONAL:** where an object can be rotated around an axis and look the same. (Exp. starfish, daisy.)

**TRANSLATIONAL:** a type of symmetry where an object, pattern or design moves without reflecting or rotating. (Exp. Checkerboard, honeycomb, palm fronds.)

*If your students are more advanced, pose additional challenges to find more advanced symmetries like: rotary reflection, transfection, double rotation, rotary translation, rotary transfection, helical, fractal and even abstract.*

As the instructor, you will need to designate an area for the challenge. Depending on where students are looking, think about implementing rules that won't disturb the zone. If you don't want learners tearing leaves from trees or moving rocks out of landscaping, use the learning tools available and have students sketch their findings, take photos or devise a similar method for "look-but-don't-touch" recording.

**Head outside and set your learners to work.** Once everyone has found as many types of symmetry as possible, gather back together to go through the class findings. Did anyone find a particularly interesting form of symmetry? What was each student's favorite? Keep the discussion moving by adding in more real-world examples of symmetry that the class may not have found on this excursion.

June is Great Outdoors Month! Do what you can to get your learners outside and spend the month appreciating everything Mother Nature has to offer.

Are you looking for more outdoor STEM ideas? Visit our website at [edventures.com](http://edventures.com) to learn about our Survivor STEAM Enrichment, the 12-day curriculum package that teaches students everything from compass navigation to water purification!



**References:**

Beddoe, J. (n.d.). What is Symmetry in Math? - Definition & Concept. Retrieved June 2, 2018, from <https://study.com/academy/lesson/what-is-symmetry-in-math-definition-lesson-quiz.html>.



For more information, visit: <https://edventures.com/collections>  
or contact a STEM Program Specialist at (800) 429-3110

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