

Developing Mathematical Mindsets

October 2024

Math in Nature

Fall is the perfect time to explore nature and all of the mathematical opportunities the outdoors has to offer! When exploring outside, children naturally play with math in meaningful ways. There are many patterns to be found in nature. Take a close look at a flower's petals, or a snail's shell. What do you notice? How can you sort your collection of leaves, sticks or rocks?

Stanford University's Development and Research in Early Math Education suggests ways to promote mathematical thinking during outdoor play:

- Encourage children to focus on specific features like weight, length, or colour. For example, say, "Wow, look at how those leaves vary in size!" This can spark their curiosity and lead to ideas like lining up or comparing the leaves.
- For curious explorers, pose testable questions. "Why does that stick roll down the hill but the other one doesn't?" or "How can you make your twig house fit your toy truck?" These prompts support early math concepts like shape and size.
- Foster active outdoor learning. Ask, "How far can you throw that ball? How fast can we run across the field? Which tree is farthest? Count your steps to find out!"

By using math to solve problems that arise through outdoor play, children begin to understand the importance of math in everyday life and see math as a tool to solve real-world problems.

Source:
<https://familymath.stanford.edu/for-educators/taking-math-learning-outdoors-into-nature/>

Taking Math Outside

Kindergarten to Grade 2

Sorting and Counting

Set a timer. How many objects in nature can you find in 5 minutes? Bring back your collection of sticks, leaves, rocks, pinecones and acorns. Can you sort by different attributes (colour, shape, size)? Count your piles. Which one has the most? What is the difference between the pile with the most and the pile with the least? How many more would you have to collect to get 100 items?



Grade 3 - Grade 5

Leaf Symmetry

Collect leaves of different shapes and sizes. Using paper to trace, or scissors to cut, can you find the lines of symmetry in the leaves? Cut a leaf along one line of symmetry. Can you draw the other half?



Grade 6 - Grade 8

Shapely Sticks

Collect a variety of small twigs. What shapes can you make that include a right angle? Can you make shapes with an acute angle? An obtuse angle? Is it possible to make a triangle with more than one obtuse angle? Can you make a hendecagon? How many interior angles does it have?

Source:
<https://thirdspacelearning.com/blog/autumn-maths-activities/>