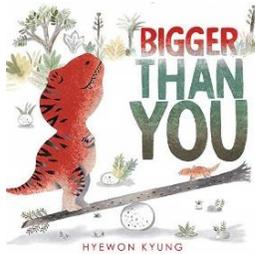


CHILDREN'S BOOKS AND RESOURCES REVIEW

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Book and Resource Review Editor

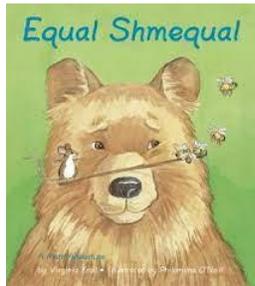
Math and Nature Connected Books and Resources

There are so many mathematical concepts to explore in nature, such as shapes, patterns, categorizing, numeracy, and one-to-one correspondence! Math is inherent in nature AND there are many ways to take mathematics outside. Children explore math through regular nature play as they play in mud kitchens, notice patterns, and find shapes in leaves. Below, find a list of math and nature related books and resources. As a caution, please verify the children's books will work for your setting, as many related books focus on more advanced concepts and ideas and some applications seem a little forced at times. I starred ones I particularly like. There is a lack of books focused on finding math in regular nature play—this is an area of opportunity for authors!



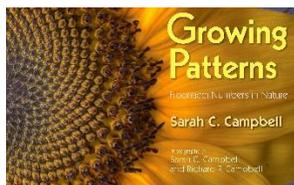
Bigger Than You by Hyewon Kyung

This comparison book shows dinosaurs engaged in nature play, creating their own seesaw with a tree and rock. Backmatter includes information on simple machines. It's a fun story and shows mathematical concepts and nature play without being overt about the principles.



Equal Shmequal by Virginia Kroll

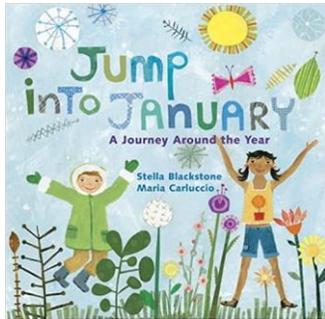
Animals watch children playing tug of war and then explore the concept of equal as they play tug of war. They divide their groups in many ways such as types of food the animals eat, whether they have fur or not, and size. They also try to balance a seesaw as they look at equal weights, with Bear and Mouse playing tug of war against the other animals. The book explores many ways to be equal, such as in math, art, law, and team sports!



Growing Patterns: Fibonacci Numbers in Nature by Sarah C. Campbell

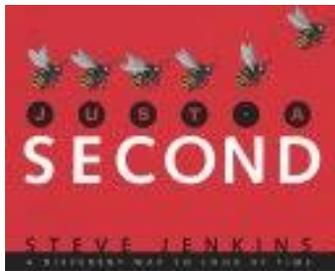
The Fibonacci pattern of 1, 1, 2, 3, 5, 8, 13 . . . is often found in nature! The beautiful natural pictures are organized for a visual representation of the sequence. The math includes patterns and simple addition. Pictures include

flowers, pinecones, pineapples, and the nautilus, as well as non-example spirals found in nature. Back matter includes more details around Fibonacci numbers and a glossary. Other books include *Mysterious Patterns: Finding Fractals in Nature*.



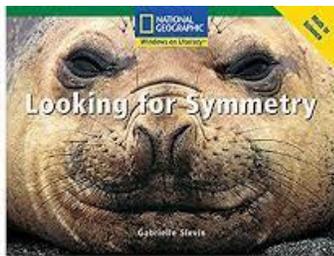
Jump into January: A Journey Around the Year by Stella Blackstone

This calendar book goes through the months of the year with time outside and a seek and find list for each month's picture, such as skating on the frozen pond in January, rain in April, gardening in May, the beach in August, and dancing leaves in November. Short rhymes accompany each two-page monthly spread. The illustrations are bright and cheery.



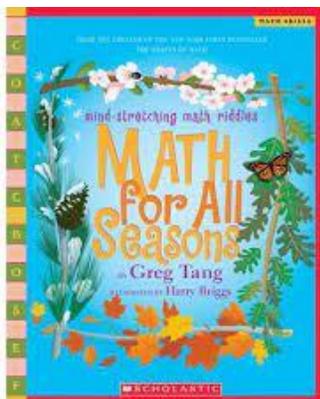
Just a Second by Steve Jenkins

This nonfiction book explores what happens in just one second, such as a flap of vulture wings, a black mamba slithering 24 feet, a bat makes 200 high pitched calls, a dragonfly flying 50 feet, and so much more! Backmatter includes a timeline of timekeeping.



Looking for Symmetry by Gabrielle Steven

A book using natural elements to explore symmetry with children. Grab a mirror to explore the lines of symmetry and then take the mirrors outside for more symmetry exploration.



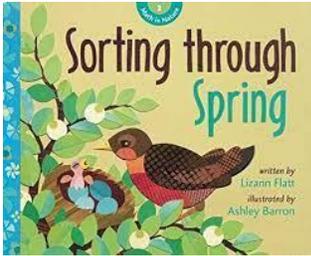
Math for All Seasons by Greg Tang

Intended for children aged 5-8, this problem-solving book encourages an open mind, thinking with strategy, using time saving methods, and simplifying problems. Rhyming phrases and coordinated illustrations ask the reader to solve age-appropriate math problems with a natural and holiday theme.



Pitter Pattern by Joyce Hesselberth

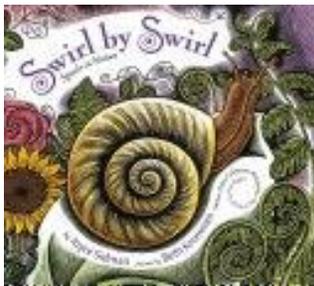
With a blend of fiction and nonfiction, the author helps children explore patterns in puddles, nature, soccer practice, and snacks. Backmatter includes ways to explore patterns in one list.



Sorting through Spring by Lizann Flatt

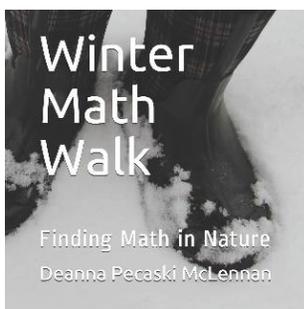
Questions rule in this book, asking the reader to make connections between nature and math. The interactive concepts include patterns, shapes, ratios, comparisons, graphing, and probability. The cut paper illustrations add to the patterns and mathematical opportunities. Some math concepts are more geared for K-2 students. The backmatter includes information on the many animals found throughout the book.

Other books include **Counting on Fall* (Number Sense and Numeration), *Sizing up Winter* (Measurement), and **Shaping up Summer* (Geometry and Spatial Sense).



Swirl by Swirl: Spirals in Nature by Joyce Sidman

Simple poetry and beautiful illustrations of spirals in nature help readers understand spirals in the natural world around them. Backmatter shares different purposes and functions of spirals with examples and details of how spirals are found in nature. Board book available as well.



Winter Math Walk: Finding Math in Nature by Deanna Pecaski McLennan

Simple black and white winter pictures combine with general written observations of a walk during winter. Concepts explored include shapes, area and perimeter, size comparison, measurement, etc. The back matter includes an author's note sharing how to have a mathematical lens outside and how adults can support math investigations. Additionally, there is a page for each picture with the various math concepts, natural information, and scientific concepts. Other books by the author include

Playground Math, Puddle Math, Autumn Math Walk, Halloween Math, Summer Math Walk, and Spring Math Walk.

Additional Resources

Early Math Counts (<https://earlymathcounts.org/>, College of Education, University of Illinois Chicago) While not outdoor specific, there are free professional trainings around math for educators working with children ages 0-5. Many blogposts and other resources on the website include an outdoor focus.

Maths Play with Loose Parts (<https://www.communityplaythings.co.uk/Learning-Library/Articles/Maths-play-with-loose-parts>, article by Dorie Ranheim)

This blogpost explores loose parts and math in nature with a good list of activities, such as sorting, making patterns, shapes, etc.

Math Learning - and a Touch of Science - in the Outdoor World

(<https://www.naeyc.org/resources/pubs/tyc/apr2017/math-learning-outdoors>, by Deanna Pecaski McLennan)

In this NAEYC blogpost, Deanna Pecaski McLennan encourages taking math tools outdoors, noticing patterns, and exploring and sorting collections.

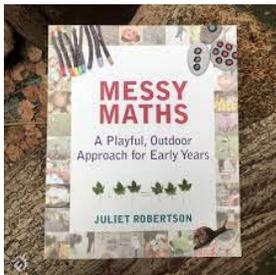
Math and Loose Parts in Nature (by Carla Gull, Loose Parts Nature Play)

In this blogpost and podcast episode, I explore concepts and ideas to recognize math in nature play, along with tips to enhance math, loose parts, and nature play.

Blogpost with pictures: <http://insideoutsidemichiana.blogspot.com/2020/09/math-and-loose-parts-in-nature.html>

Podcast episode on Loose Parts Nature Play: <https://loosepartsnatureplay.libsyn.com/math-and-loose-parts-in-nature>

Messy Maths by Juliet Robertson



Brilliant book on taking math outdoors with a variety of pictures, ideas, and resources. These low-cost approaches to mathematical concepts are easy to implement. Nature play and hands-on approaches are key with recognizing the math in everyday life. Juliet's blog is also a FANTASTIC resource with over 90 blogposts on math and the outdoors:

<https://creativestarning.co.uk/maths-outdoors/>

Nature + Exploration = Boundless Mathematical Explorations (<https://natureexplore.org/nature-exploration-boundless-mathematics-learning-2/> by Nature Explore)

This blogpost shares various stories of how math concepts have been explored in outdoor classrooms.

If you have ideas or would like to contribute book or resource reviews, please contact Dr. Gull at Carla.Gull@phoenix.edu.