

30 Days Wild

30 Days Wild is an annual challenge run by the UK Wildlife Trusts during the month of June, to encourage people to spend more time outside and engage with nature. We love taking our maths outdoors, so we've come up with 30 fun ideas to get you active in nature and incorporate some maths along the way. And don't worry, there's plenty of suggestions too for those who live in very urban settings.

1. Stick Sorting

Here's an easy activity to get you started. Go for a walk in a nearby park, or head for your garden if you have one, and collect 5-10 sticks. Now sort the sticks in order of length.

2. Obstacle Walk

Design an obstacle course outdoors using existing markers such as tree trunks or park benches, or set up markers using natural materials like sticks or rocks. Take it in turns with one person being blind folded, and the other using directional language such as forwards, backwards, turn left, turn right, quarter turn etc. to navigate the blind folded person through the course.

3. Shape Hunt

Whether you live in a rural or an urban area, head outside for a walk around your local neighbourhood to see what shapes you can discover. Some will be easier to spot than others. In the countryside, look out for leaves or petals of plants, details of buildings or fences, and way markers. If you live in the city, you can find a lot of different shapes hidden among traffic and street signs, road markings, or architectural features.

4. Geocaching

Navigate your way to one of the many geocaches hidden worldwide using GPS. Geocaching is a location-based activity, where seekers use coordinates to find the hidden caches. A cache is typically a waterproof container with some kind of logbook inside, which you sign once you've found the cache. Some larger caches also contain items for trading, such as little trinkets. Go to www.geocaching.com/play and choose a geocache near you, then let the search begin! The Geocaching mobile app can help you along the way too.

5. Stick Maze

Collect sticks of different lengths and lay them out into a maze. Get a friend to navigate the maze using a pebble or other nature object as a marker. Or you could build a life size maze out of lots of sticks, for your friend to walk through!

6. Measuring Challenge

For this activity, you'll need a ruler. A pencil and paper, and maybe a clipboard to lean on, can also be helpful if you want to record your findings. Grab your ruler and head outside for some measuring fun!

Find something smaller than 1 inch, and something bigger than 10 inches.
Measure a blade of grass, a flower stem, or the length and width of a leaf.

If you are going out in a group, compare your findings to see who measured the smallest or biggest, longest or widest.

7. Making Potions

Making potions is a fun activity involving counting and measuring. Children can use containers, measuring cups or weighing scales to measure the weight and volume of 'ingredients' such as petals, leaves, pebbles, seeds etc. Mix them together with some water to create a 'potion'. Can they follow a recipe? Can they create their own recipe?

8. Pattern Hunt

If you've tried our Shape Hunt (Day 3), why not try a Pattern Hunt next! What kinds of patterns can you spot in your garden or neighbourhood? Look for different tree barks, arrangements of flower petals, or insect markings such as spots on a ladybird or symmetrical patterns on butterfly wings. If you live in a more urban area, you can find patterns outdoors in things like paving stones, brick walls, or window and door arrangements.

9. Make a Sundial

Reading a clock to tell the time is one of the maths skills children learn at primary school. But before there were modern clocks, people used other methods to tell the time, such as sun dials. In simple terms, a fixed object on a sunny day will cast a shadow and as the sun moves across the sky that shadow will change position. Make a sundial together, then head outside to put it in to action. The BBC Sky at Night website has a good paper sundial tutorial:

<https://www.skyatnightmagazine.com/advice/diy/how-to-make-a-paper-sundial>

10. Mini Beast Survey

Head out to look for mini beasts together, such as earthworms, slugs and snails, slaters, beetles, spiders or caterpillars. Keep a tally of how many of each you spot. This is an great exercise to introduce children to collecting and sorting data, and counting in blocks of five. You can also use the opportunity to talk about probability, and estimate what kind of mini beasts and how many you will find depending on the time of year and weather (hot or cold, wet or dry).

11. Noughts & Crosses

Play a game of noughts & crosses outdoors using different natural materials such as leaves and pebbles as the markers. Use one kind of material to represent the noughts, and one for the crosses. You'll need five markers each. Make the grid out of sticks, or take along a piece of chalk to draw a grid on the ground.

12. Maths Photography

Grab a camera and head outdoors to take some wild maths inspired photographs - what will you find?

13. Find the Fractals

A fractal is a pattern that repeats itself over and over again at different scales, with any small part similar, though not always identical, to the whole. The repetition that occurs in a fractal is called “self-similarity”. Another way to think of this is that when you zoom in on a small part of a fractal pattern, it looks similar to the whole thing. There are lots of examples of fractals in nature, a prime example being trees - from the trunk, to the branches, to the smallest twigs and even the veins on the leaves, the branching pattern repeats itself. Take some time outside to let children observe this.

Other examples of fractals you may find include fern fronds, rock formations and clouds, or cauliflower and broccoli at your local greengrocers. Depending on where you live, you can also observe fractals in river deltas, coastlines, or mountain formations.

14. Morse Code

Head out after sunset for an evening walk and bring along a set of torches. Try to go somewhere with not too many streetlights, such as a local park, but make sure you stay safe! Use the torches to communicate with each other via Morse Code - a short flash of light represents the dots, while a long flash represents the dashes. The CBBC website has a copy of the Morse Code alphabet for reference, plus a wee quiz to test your Morse Code knowledge: <https://www.bbc.co.uk/cbbc/quizzes/bp-morse-code-adventure>

15. How many legs?

This activity is similar to the mini beast hunt from Day 10, but this time we're on the lookout for all kinds of creatures, big and small! How many creatures can you spot with 2 legs, 4 legs, 6 legs, or 8 legs? Can you find any with more than 8 legs? Or no legs at all? Keep a tally of how many creatures you spot for each number of legs, then work out how many legs you've spotted in total. This is a great activity for counting (how many of each), multiplication (e.g. 5 creatures with 4 legs each = 20 legs), and addition (adding everything together at the end). You could do this activity as a team, or see who can spot the most legs.

16. Egg Race

This activity requires several people to play. For each player, you will need ten plastic eggs (or something similar, such as pompoms, ping pong balls or even pinecones), a spoon, and a bowl. The players place their eggs (or egg alternatives) on their spoon, and race them one at a time to the finish line, where they drop them in their bowl. If they drop an egg along the way, that egg is lost and they go back to the starting point for a new egg. Once all eggs have been transported, players count how many eggs they successfully took across the finish line and deduct that number from 10. The player with the lowest score wins.

17. Nature Walk

Whether you live in an urban or rural area, a nature walk is a perfect activity to teach children about directional language such as clockwise, anticlockwise, right turn, left turn, quarter turn etc. Discuss the route you will take before heading out, and while you are on your walk ask children to describe where you are going. If you can, take along a map to practice reading grid co-ordinates, e.g. “What’s the name of the street at C5 on the map?” or “What are the co-ordinates of our school?”

18. Angle Hunt

Let’s have some fun outside with angles! Give children a square piece of card, with one corner marked as 90° (right angle) – this is their ‘angle hunter’. They can use this to identify things that have right angles, things with angles greater than 90° (obtuse angles) or less than 90° (acute angles), e.g. angles of branches, the offshoots of plants, or manmade things such as parts of buildings. For a more advanced activity, children can use protractors to measure different angles outdoors more precisely. What’s the smallest angle they can find? And the largest?

19. How Much is 100?

This activity is all about understanding that the size of an object doesn’t affect the value of the object. Depending on what natural resources you have available to you – such as sticks, pebbles, leaves, blades of grass, acorns, pinecones etc. – pick 3 to 4 different items, and get children to collect 100 of each item and lay them out in sets. Since 100 is a very big number, it helps to break it down in to groups of 10 items at a time, until you get to 100.

This activity covers different aspects: counting, grouping by 10, and comparing different sets of 100. How can the sets all be the same (100 items) but also different (some take up more space, some less)?

20. Build a Birdhouse

Building a birdhouse or nest box together is great activity to practice your knowledge of angles, shapes and measuring. The RSPB have a step-by-step guide for how to make a bird box:

<https://www.rspb.org.uk/helping-nature/what-you-can-do/activities/build-a-birdbox>

This will require help from an adult.

21. Repeating Patterns

Collect some nature items, such as leaves, pebbles, small pinecones, acorns, shells or feathers, and arrange them in a repeating pattern. See if children can copy or continue the pattern, then challenge them to create patterns of their own. You could also use different types of leaves to make patterns based on leaf shape, which requires some closer observation skills, e.g. leaves that are a similar shape and size but have smooth versus serrated edges.

22. Investigating Circles

We’ve been out measuring the length and width of nature items (Day 6), now it’s time to get to grips with investigating circles. Use a measuring tape to measure the circumference e.g. of flower pots, tree stumps, or other circular objects found outside. If you don’t have a measuring tape, you can use a

piece of string and then measure that with a ruler afterwards. What's the biggest circle you can find? And the smallest?

23. Pi Spotting

If you watched the videos from yesterday's activity (Day 22), you'll have learned all about π (pi). Pi is a mathematical constant that is the ratio of a circle's circumference to its diameter. Regardless of the circle's size the ratio will always equal pi, approximately 3.14 though its decimals are infinite. The first twenty digits of pi are 3.1415926535897932384. Use the digits as a guide for an 'eye spy' spotting game, taking it in turns to suggest something to spot next: 3 birds, 1 tree, 4 flowers, 1 river... how far along pi can you get?

24. Tower of Hanoi

The Tower of Hanoi is a fun logic puzzle, consisting of three rods and a stack of discs of decreasing size. The aim is to move the discs from the first to the last rod, according to certain rules. You can recreate this puzzle with natural materials – instead of rods, use sticks (or chalk) to mark out a grid of three squares. Then collect leaves of different sizes in place of the discs.

https://en.wikipedia.org/wiki/Tower_of_Hanoi

25. Nature Art

Working individually or as a team, use natural materials such as leaves, pinecones, acorns, pebbles, sticks or feathers to create artworks. Include a mathematical twist by incorporating repeating patterns or lines of symmetry.

26. Bird Watching

Head to a park or even your garden with binoculars. What feathered friends can you spot? Use a field guide or the RSPB website to identify as many as you can! <https://www.rspb.org.uk/birds-and-wildlife/a-z> Keep a tally of how many of each different kind of bird you spot. Just like the Mini Beast Survey (Day 10), this is a great exercise for introducing children to collecting and sorting data, and counting in blocks of five.

27. Stick Race

If you have a stream or river near you, race sticks down flowing water with a friend. Start at the same time and choose a marker for a 'finish line'. Estimate whose stick will win, based on weight and dimensions of your sticks. Experiment with different types of sticks, or see how creative you can get with a homemade boat (use only natural materials, and nothing that would pollute the environment if it got washed away).

28. Finding Fibonacci

The Fibonacci Sequence is a sequence in which each number is the sum of the two preceding numbers: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55 and so on. This pattern and its numbers are found a lot in nature. For example, many flowers have 3, 5, 8, 13, 21 or more petals. Why not put this to the test and count some petals on your next walk?

If you square each Fibonacci number (1x1, 2x2, 3x3, 5x5 and so on) and arrange them clockwise in sequential order, a spiral can be formed by connecting the corners with a curve (see example here: https://en.wikipedia.org/wiki/Fibonacci_sequence#/media/File:Fibonacci_Spiral.svg). The curves of many animal horns, claws, beaks or tusks follow this spiral. Keep a look out for this next time you visit a zoo or farm.

Other examples of the Fibonacci numbers or curve in nature include snail shells, sunflowers heads, pinecones, pineapples, Romanesque broccoli, the furred fronds of young ferns, and some aloe plants. Where can you find Fibonacci?

29. Nature Diagram

Once children have had some experience sorting and categorising objects based on one variable (size, colour, shape etc), they can progress to sorting objects with more variables that have 'overlapping' features. Venn Diagrams - represented by two or more overlapping circles - are one way of visually representing data where different sets have something in common.

Use hoops or draw circles with chalk to create the diagram. Now children can sort collected nature items based on different and shared features. Taking leaves as an example, in one circle place any leaves that are green and in the other any leaves that have a serrated edge. Any leaves that are both green AND serrated would be placed in the area where the circles overlap.

Are there other ways you could sort the leaves? What else do they have in common? You can try the same activity with other nature objects too.

30. Insect Investigation

A nice and simple activity to end 30 Days Wild on: Spot an insect and follow its path. Record your observations. What patterns does it make?

We hope you have fun with our 30 Days Wild activities. We'd love to see what you get up to, so please feel free to share photos and tag us on social media. Don't forget to use the hashtags #MathsWeekScot and #30DaysWild!