

Stirling University Maths Trail

Have a walk around campus and see how there is mathematics in architecture, art and nature.



1 Airthrey Castle



Airthrey Castle was built in 1791 to a design by influential architect Robert Adam, and has served as everything from a grand residence to a maternity hospital in the years since.

If you look at the building you can see it contains lots of different shapes both in the structure of the building e.g. the towers which are different shapes and the decoration. Can you spot arches, cones, cylinders, rectangles?

2 Dragon's Wing



OK, it might not be a dragon's wing but that is what I want it to be and art is in the eye of the beholder. The mathematics of this piece is all about angles. As the angles between the struts at the top of the wing get bigger the space between them gets bigger at the edge of the wing, you can see that if you look at your hand and spread your fingers out and then squash them together again.

3 Tumble #130 by Andrea Geile



This is a new sculpture which inspired this maths trail. In this piece, the artist was inspired by ivy which is a recurring theme in her work. She describes it as one of the most bio-diverse plants in Scotland, supporting animals and wildlife, ever-growing, everlasting, and 'a lovely image for life'. When she unveiled the work she said it had a prime number of leaves- although she did not reveal the number. A prime number is **a whole number greater than 1 whose only factors are 1 and itself**. A factor is a whole number that can be divided evenly into another number.

Activity:

Try the prime number activity to see how to find them!



Garden of Time

The final two trail points are in the Garden of Time, which is a beautiful haven where all are welcome to enjoy a peaceful moment surrounded by nature, history and art.

4 Labyrinth



The Labyrinth is a path of reflection. Slowly walking the path to the centre of the labyrinth and back out again gives you time to: Slow down; Still the mind; Let go of everyday concerns; Renew inner calm. What is the difference between a maze and a labyrinth? A labyrinth contains only one path, often spiralling around and folding back on itself, in ever-decreasing loops, whereas a maze contains branching paths.

Activity:

Can you solve the mazes in the activity sheet?

5 Sundial



A sundial contains a gnomon, or a thin rod, that casts a shadow onto a platform etched with different times. As the sun changes relative positions over the course of a day, the rod's shadows change as well, showing the change in time.

ACTIVITIES

Prime Numbers Activity (for Trail Point 3)

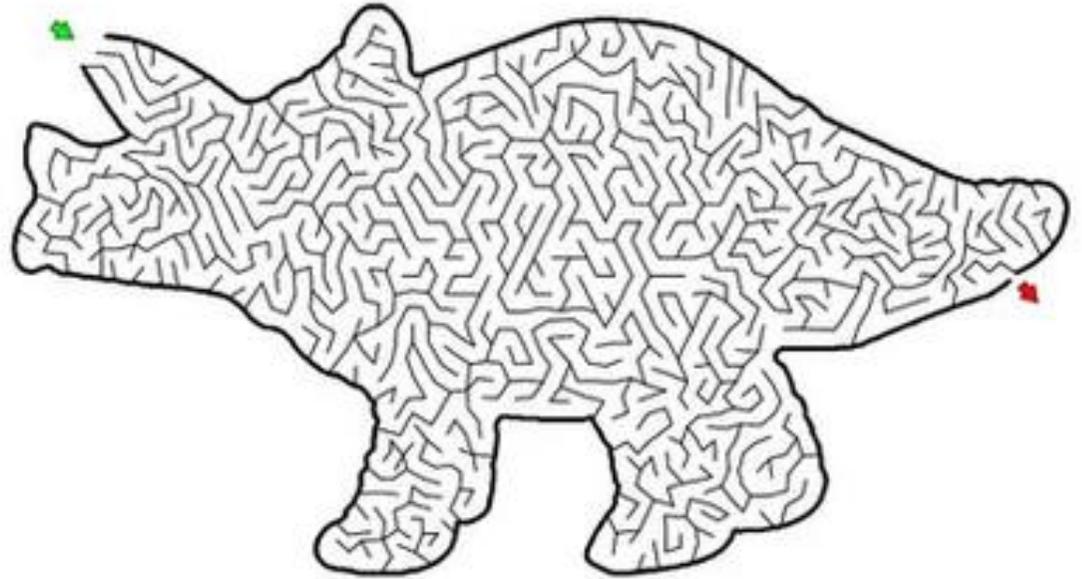
A prime number is a whole number greater than 1 (so 1 is not a prime number) whose only factors are 1 and itself. A factor is a whole number that can be divided fully into another number. To find out which numbers between 1 and 100 are prime numbers follow the rules below, this method is called **sieve of Eratosthenes**

- 2 is the smallest prime number but no multiples of 2 are prime numbers (since they can be divided by 2), so cross off every second number, ie all of the even numbers bigger than 2 (4, 6, 8, 10, 12 etc).
- The next prime number is 3 but no multiples of 3 are prime, so cross off every multiple of 3 ie every third number (6, 9, 12, 15, 18 etc).
- Look for the next number which is not crossed off (eg 5) this is the next prime number and then cross off every multiple of that number.
- Continue like this until there are no more numbers to cross off, the uncrossed numbers are the primes.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Maze Activity (for Trail Point 4)

Try to find your way through these mazes!



From: <https://www.supercoloring.com/puzzle-games/labyrinth-game-puzzle>

From: <https://krazydad.com/mazes/>

This map view shows a close-up of the Trail and the five Trail points.

