

MATHS TREATS

BY LUCIANA
THE POSSUM



BRIGHT: WINTER ON THE BIG FELLA

Mount Bogong is often translated as bigfella in the local Aboriginal language. It is the tallest mountain in Victoria and reaches 1,986 m above sea level. Despite its height, Mount Bogong only has snow for a few months a year, from mid-winter to spring.

SNOWFLAKES



Whilst it is unlikely to be able to find two identical snowflakes, snow crystals can typically be categorised into seven different patterns which comprise 35 different shapes.

ACTIVITY

Get together with some friends to make a collection of paper snowflakes using the instructions at www.instructables.com/id/How-to-Make-6-Pointed-Paper-Snowflakes/. Whilst you may all start out by folding the paper the same way, how many different snowflakes can you make? Can the snowflakes be categorised into groups by shape? What proportion of the snowflakes were identical?

REFERENCES AND FURTHER READING

SNOWFLAKES

Mount Bogong https://en.wikipedia.org/wiki/Mount_Bogong

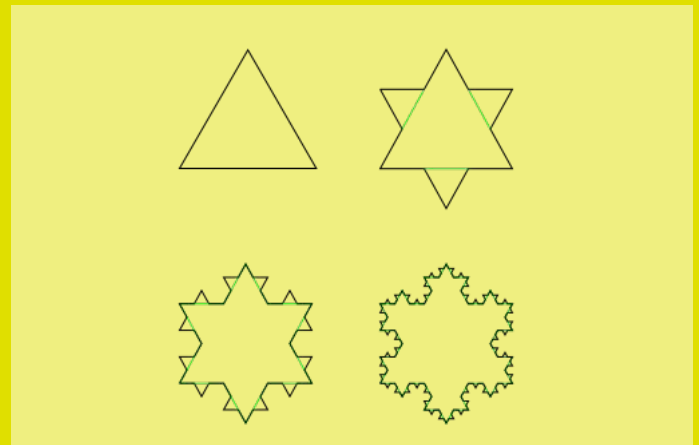
Why are all snowflakes different? <https://wonderopolis.org/wonder/why-are-all-snowflakes-different>

Snowflakes all fall in one of 35 different shapes www.smithsonianmag.com/smart-news/snowflakes-all-fall-one-35-different-shapes-180953760/

The shapes of snowflakes www.compoundchem.com/2014/12/10/snowflakes/

Close-up snowflake photos www.huffingtonpost.com/2013/12/03/alexey-kljatov_n_4373888.html

FRACTALS AND THE KOCH SNOWFLAKE



A fractal is a geometrical shape (or process over time) which is iterative, has zoom symmetry, is often infinitely self-similar and has fractional dimensions. The term was coined by Benoit Mandelbrot in 1975. One of the earliest fractal curves to be described was the Koch snowflake in 1905. A Koch snowflake is formed on an equilateral triangle base by repeating the following steps in a recursive process: (1) divide each side (line segment) into thirds, (2) create equilateral triangles on the middle thirds from Step 1, and (3) remove the bases of the new triangles from Step 2.

ACTIVITY

Create a Koch snowflake using an interactive graphing package or coding your own algorithm. How many sides will the curve have after each iteration? What do you think will happen to the enclosed area as the number of iterations increase? What do you think will happen to the perimeter?

FRACTALS

What are fractals? <https://theconversation.com/explainer-what-are-fractals-10865>

Fractals <https://en.wikipedia.org/wiki/Fractal>

Koch snowflake https://en.wikipedia.org/wiki/Koch_snowflake

WINTER MATHS

Winter maths www.educationworld.com/a_curr/mathchat/mathchat015.shtml

IMAGES

Leadbeater possum - Steve Kuitert

Snowflake - Pixabay

Koch snowflake - Wikimedia Commons