Sierpinski Christmas Tree

Activity Type: Crafting

Best suited for: Second Level and above/ Age 8-11, 12-15, 16+

Maths involved: 3D shapes, fractals, scaling, repeating pattern

Materials needed:

- 8 sheets of A4 green card
- our tetrahedron template
- a pencil
- a ruler
- scissors
- glue
- sticky tape
- mini pompoms (optional)

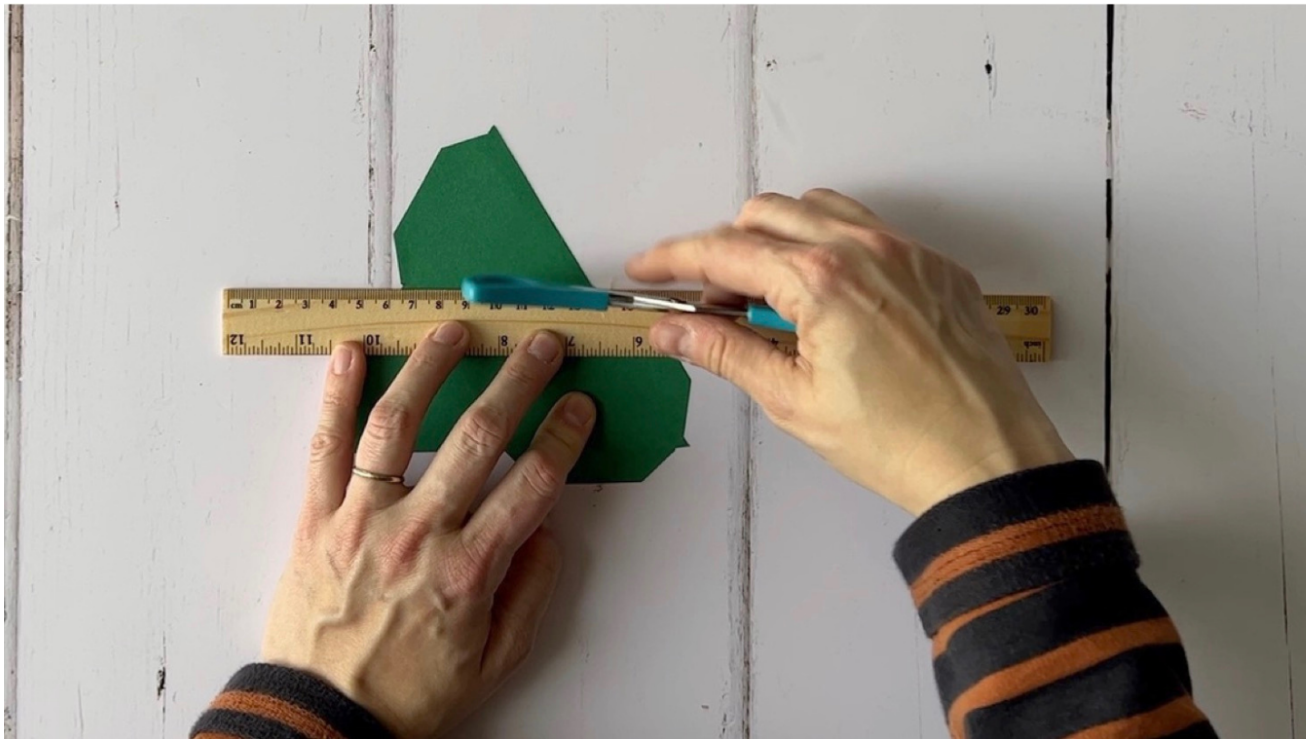
The Sierpinski triangle (named after polish mathematician Wacław Sierpiński) is a pattern of equilateral triangles that repeats again and again at different scales. This kind of pattern, where a shape is made up of smaller versions of itself, is called a 'fractal'.

Our Sierpinski Christmas tree is a large pyramid made of smaller pyramids. This particular pyramid, made up of four equilateral triangles, is called a tetrahedron. Our tutorial shows you how to make a tree with 16 tetrahedra, but since a fractal can repeat endlessly, you can keep adding layers to build a tree as large as you want!

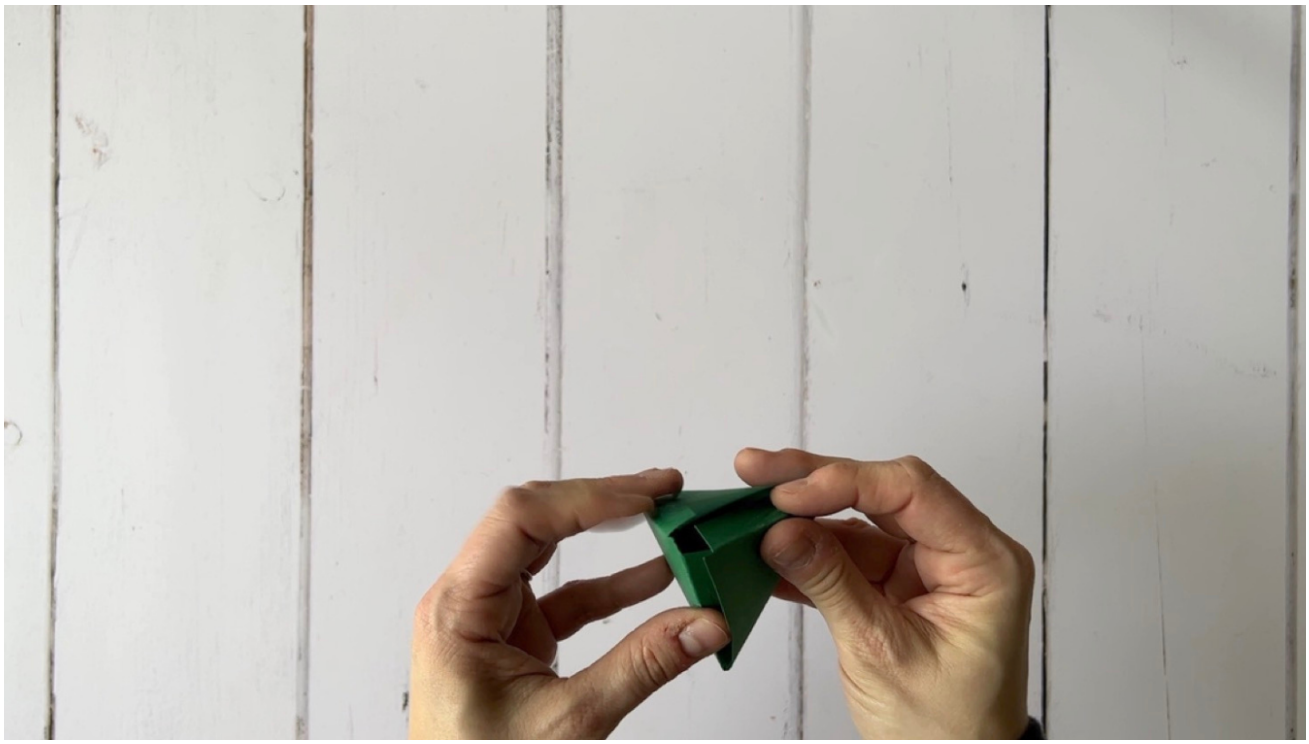
Instructions

Step 1: Use the template to draw around and count out 16 tetrahedron pieces. You should be able to cut out two pieces from each sheet of A4 card.

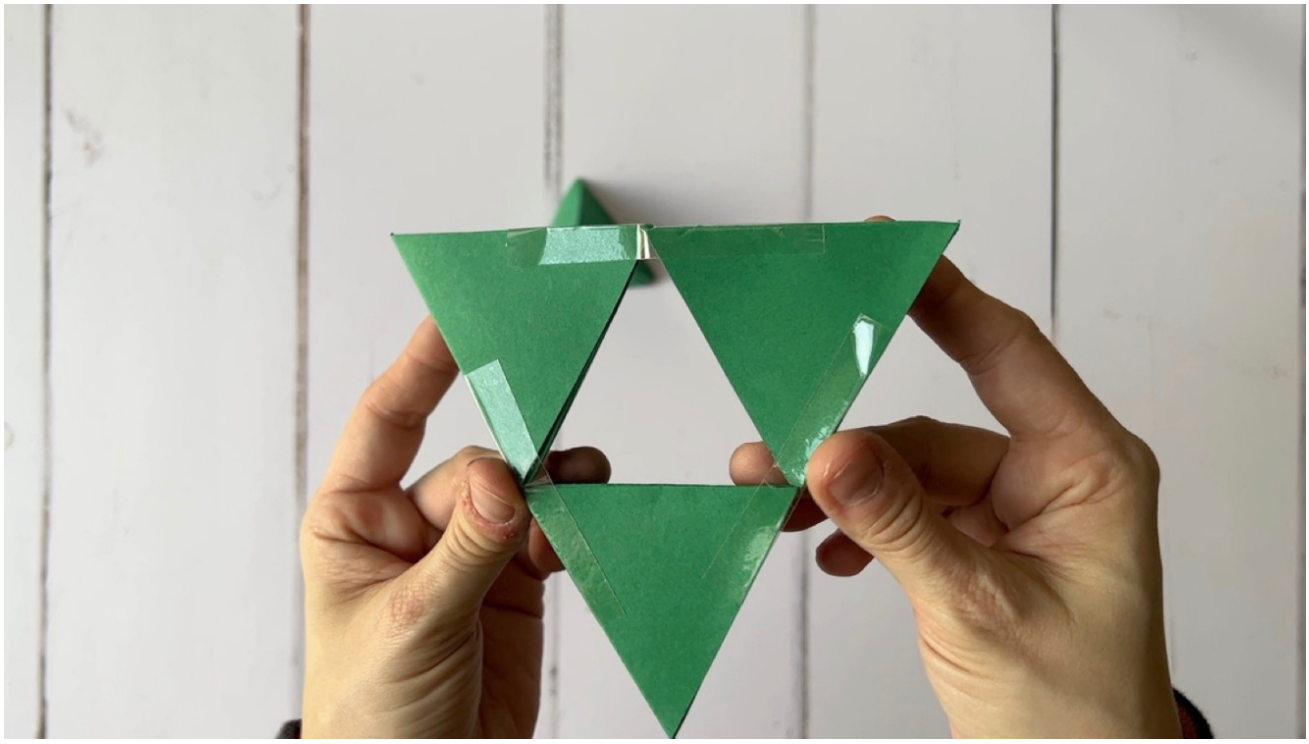
Step 2: Use scissors and a ruler to lightly score along the folding lines. This will make it easier to fold.



Step 3: Fold each piece in to a 3D shape, add glue to the flaps, tuck them in and hold for the glue to dry.

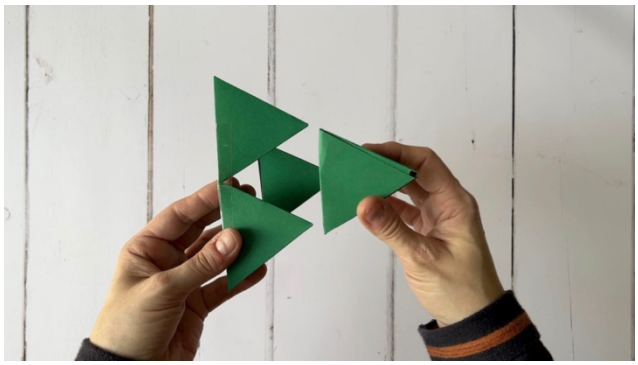


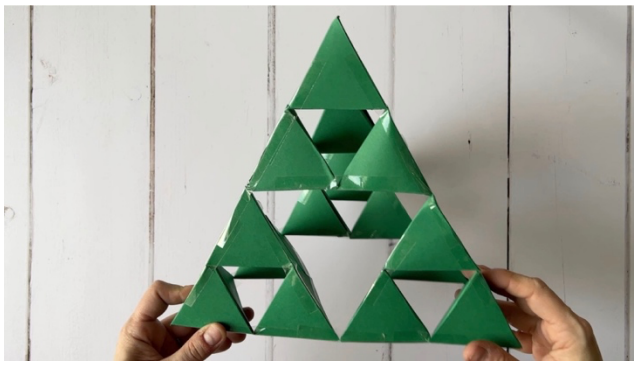
Step 4: Now tape four of the tetrahedra you just made together, to form one larger tetrahedra. Start with three and tape them together along their edges to form a base, then tape the fourth one on top.



Repeat this process three more times with the remaining twelve tetrahedra.

Step 5: Now tape those four larger tetrahedra together in the same way, to create one giant tetrahedra. Again, three pieces will form the base and the fourth will sit on top.





And that's your tree done! Feel free to decorate it e.g. with some pompoms.