**Koch Snowflake**

The Koch Snowflake is a famous fractal design, named after Niels Fabian Helge von Koch (Sweden, 1870-1924). The snowflake is connected and does not have any breaks or gaps in it. But it is not smooth. The snowflake is evenly *jagged* because it has an infinite number of sharp corners that are packed together more closely than pebbles on a beach.

The Koch Snowflake begins at **Stage 0** with an equilateral triangle.

Next, each side of the triangle is divided into 3 congruent parts. The middle part on each of the three sides is erased and replaced with a dashed line (shown below). Using the length of the dashed line, new equilateral triangles are constructed. These triangles lie in place of the dashed lines as shown in Stage 1 below. Notice that only two sides of the new triangles remain.



 **Stage 1**

1. Draw **Stage 2** of the Koch Snowflake.
2. Write a recursive rule for the number of sides in the Koch Snowflake at any stage.
3. Using the recursive rule, how many sides will there be in Stage 3?
4. Complete the table below.

|  |  |
| --- | --- |
| **Stage** | **Number of Sides** |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |

1. Write an explicit rule for the number of sides in the Koch Snowflake at any stage.
2. How many sides are in the Koch Snowflake at Stage 8? Explain why.