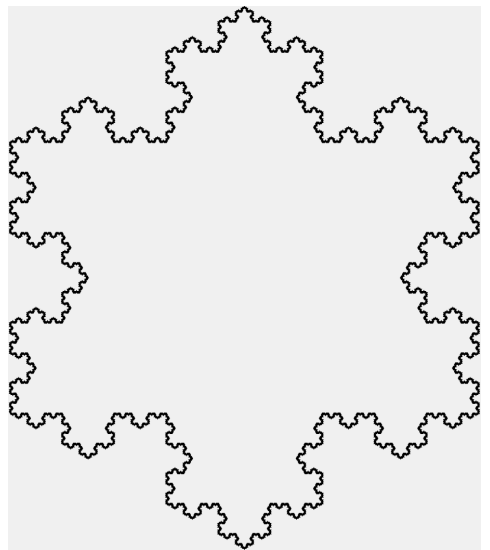
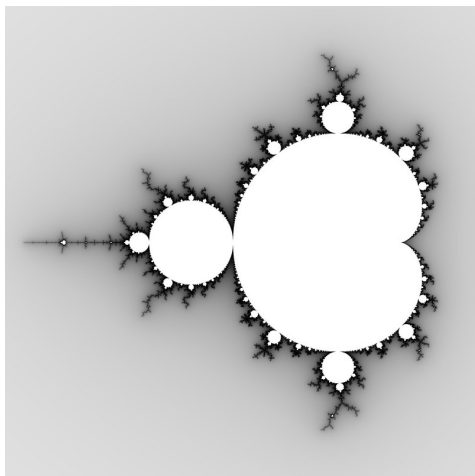
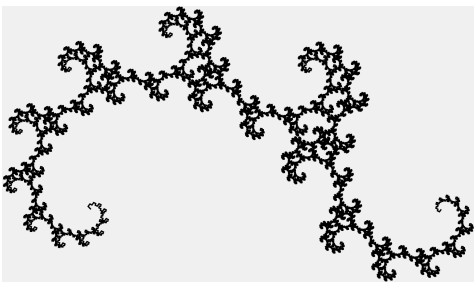




Introduction

Fractals are a type of mathematical pattern. If you zoom in on one part, the pattern looks similar to the original pattern (“self-similarity”). With math, we can imagine infinitely complex fractals. In nature, many patterns are fractal-like, from coastlines to romanesco cauliflower to clouds. Both mathematical and natural fractal structures can be beautiful. On the back of this page, you can start to create a classic fractal: the Sierpiński triangle.





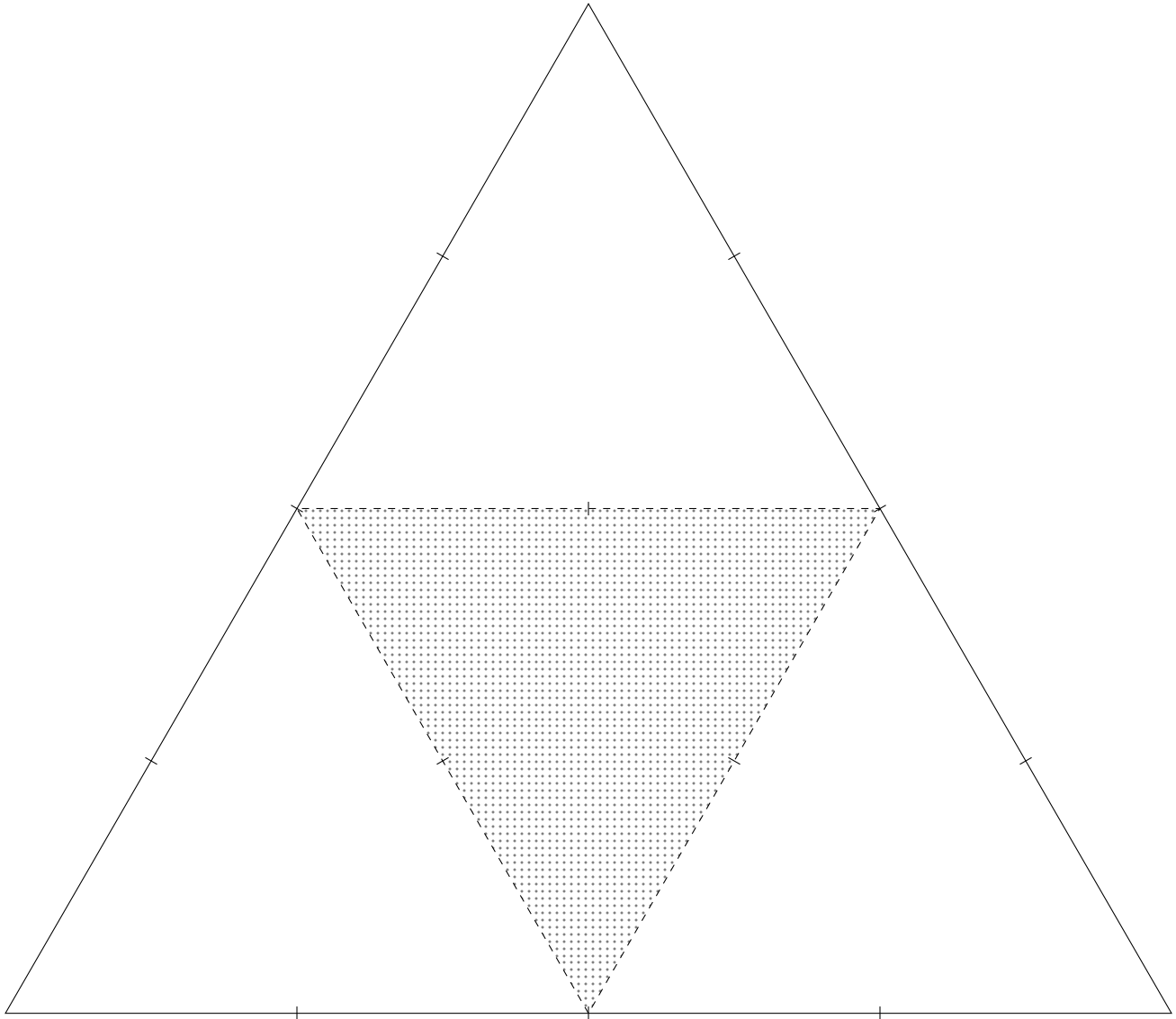
Enjoy :) and check out Fairview Math Club for more!



Email me = Dave Kaplan kaplandm@missouri.edu or Mr. Allee tallee@cpsk12.org for information
 Visit <https://kaplandm.github.io/FVE/> for the full fractals worksheet from Math Club (and more)



Sierpiński triangle

Instructions: each round (or “iteration,” or “stage”), shade the middle of each  to make it look like  and then keep repeating. Hint: as in the template, mark the halfway point along each side, then connect the three points to make the upside-down triangle, and remember to shade it in.



- M1. After one iteration, when it looks like  , how many unshaded triangles \triangle are there?
- M2. After two iterations, how many unshaded triangles \triangle are there?
- M3. If there were N unshaded triangles in the last (previous) stage, then how many unshaded triangles will there be in this stage?
- F1. After one iteration, when it looks like  , what fraction of the original triangle is shaded?
- F2. After two iterations, what fraction of the original triangle is shaded?
- F3. After three? Four? If you keep going forever, will the triangle ever get completely shaded?