

# Sierpinski's Triangle

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## Concept

Sierpinski's triangle is a self-similar fractal with the repeating pattern being equilateral triangles within a large equilateral triangle. A fractal is an infinite pattern that continues repeating on different scales.

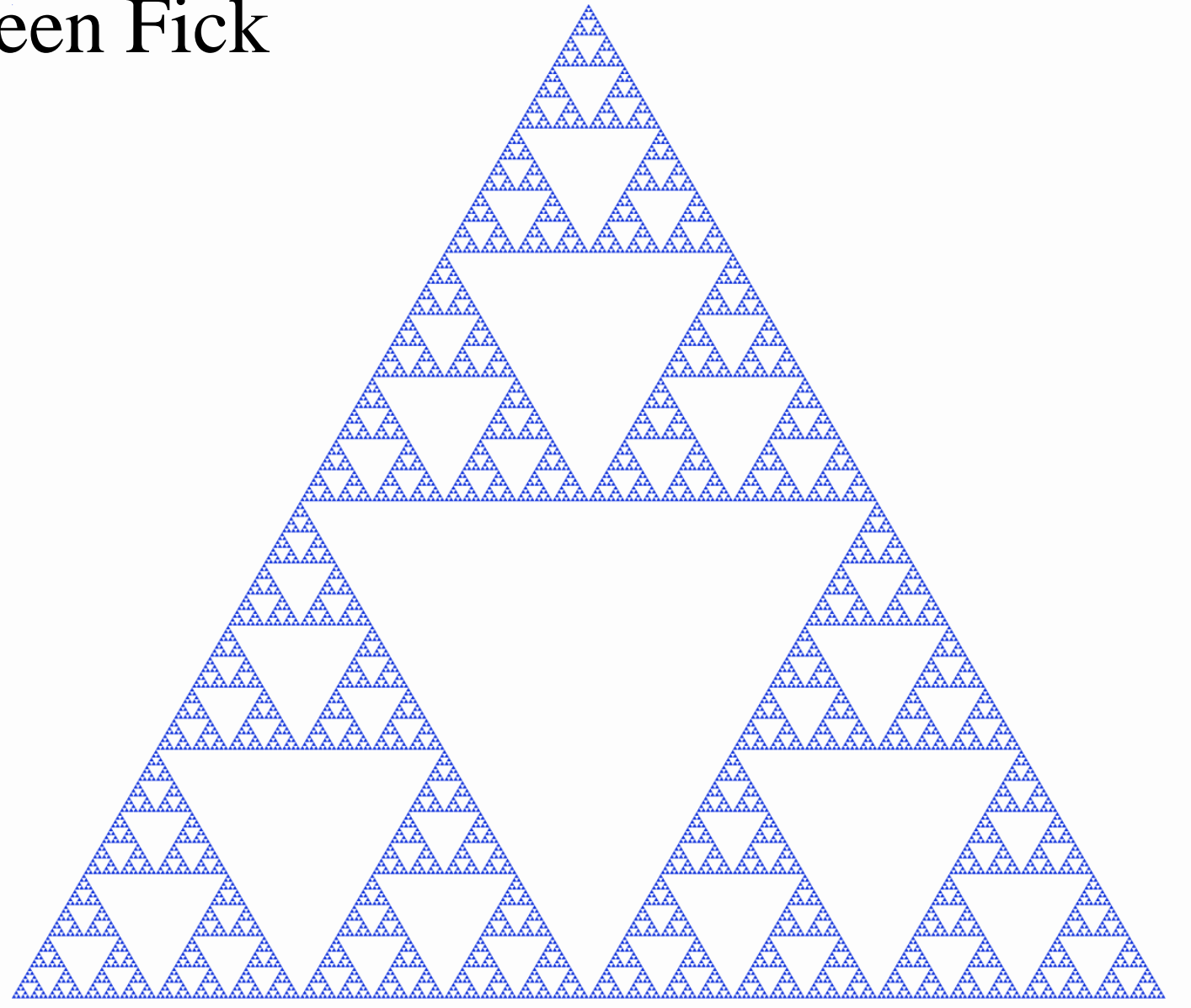


Figure 1: Sierpinski's Triangle

## Impact on Geometry

The triangle provides a physical representation of fractals. It also shows that an infinite series with a finite sum is not theoretical.

## History

- ❑ Early versions of the triangle can be seen in tiled flooring of early Roman churches
- ❑ Although this cannot be confirmed, historians believe the triangle was recognized around the same time as the Apollonian Gasket (3rd century BC)
- ❑ 1915 first described by Polish mathematician Waclaw Sierpinski



Figure 2: Church tiles with Sierpinski's triangle



Figure 3. A still from Guardians of the Galaxy Vol. 2 where fractal technology was implemented.

## Real World Applications

Sierpinski's triangle became the basis for fractal-generating software. This computer program is heavily used in special effects departments on major motion pictures.

## Apollonian Gasket

- ❑ In layman's terms, it is the circular counterpart to Sierpinski's Triangle
- ❑ It is a self-similar fractal with an infinite number of circles within one large circle

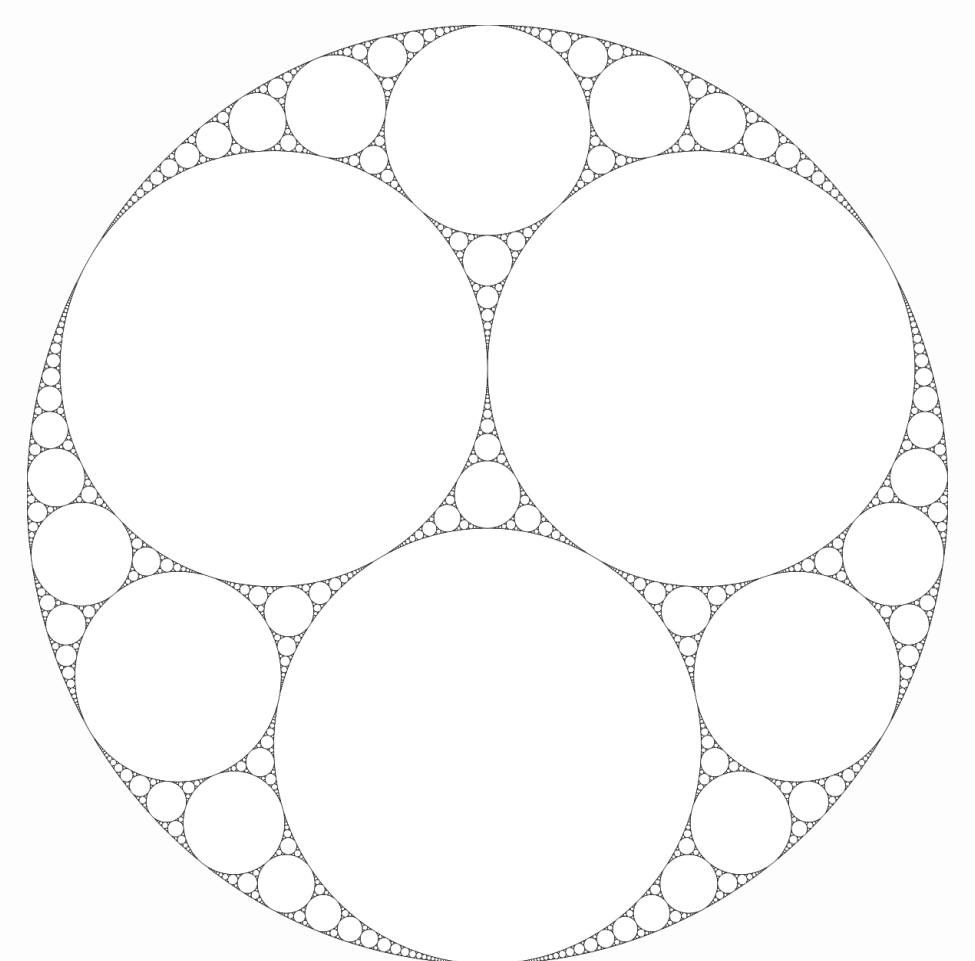


Figure 4. The Apollonian Gasket

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**Figure 1.** *Sierpinski triangle.svg*. (2007). Wikipedia. photograph. Retrieved March 24, 2022, from [https://commons.wikimedia.org/wiki/File:Sierpinski\\_triangle.svg](https://commons.wikimedia.org/wiki/File:Sierpinski_triangle.svg).

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**Figure 4.** Time3000. (2008). *Apollonian Gasket*. Wikipedia. photograph. Retrieved March 25, 2022, from [https://en.wikipedia.org/wiki/File:Apollonian\\_gasket.svg](https://en.wikipedia.org/wiki/File:Apollonian_gasket.svg).