



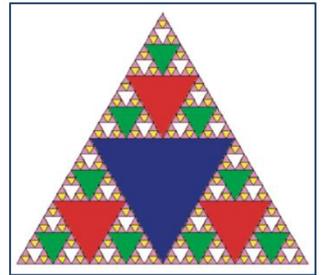
Private Secondary Schools "Klasika" Research Days - 2018 "The Mill"
Study and research area „3D Shredding or Sierpinski triangle”

Student's worksheet

Name, surname, form _____

The term "*fractal*" was first used by mathematician Benoit Mandelbrot in 1975. In *math*, a *fractal* is a never-ending pattern. *Fractals* are built by repeating something over and over again.

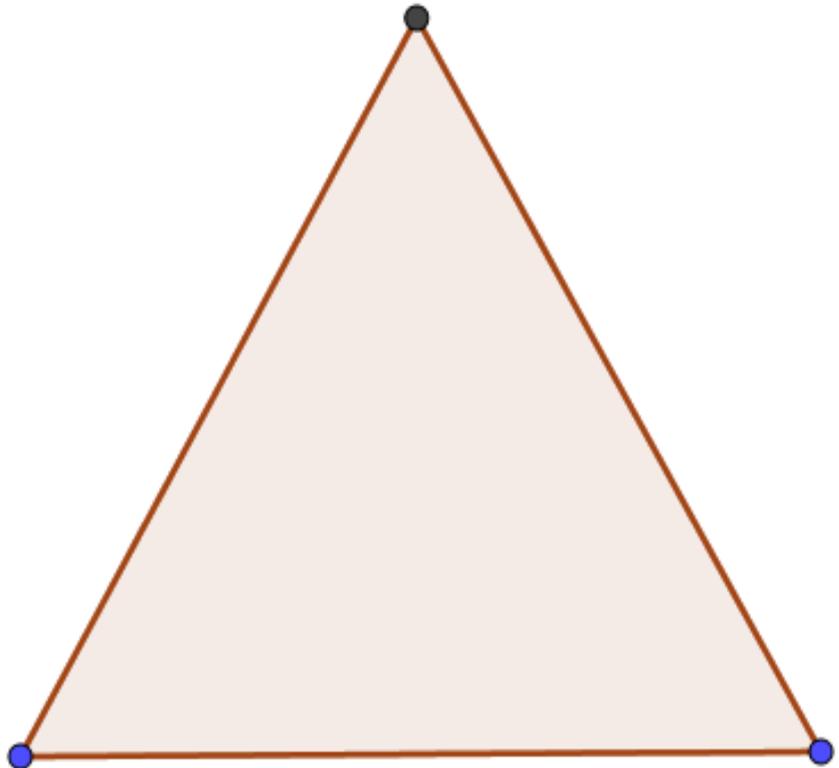
There are quite a lot of fractals named after Waclaw Sierpinski, a Polish mathematician who lived from 1882 to 1969.



Construction

The Sierpinski Triangle, also called Sierpinski Gasket and Sierpinski Sieve, can be drawn by hand as follows:

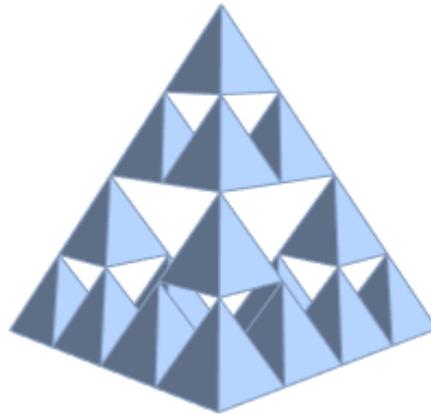
1. Start with a single triangle.
2. Inside this triangle, draw a smaller upside down triangle. Its corners should be exactly in the centers of the sides of the large triangle.
3. Now, draw 3 smaller triangles in each of the 3 triangles that are pointing upwards, again with the corners in the centers of the sides of the triangles that point upwards.
4. Now there are 9 triangles pointing upwards. In each of these 9, draw again smaller upside down triangles.
5. In the 27 triangles pointing upwards, again draw 27 triangles pointing downwards.
6. Rinse, repeat. After infinite steps, and if all triangles pointing upwards would be filled, you have the Sierpinski Sieve. Every step, more triangles have to be drawn. This is a recursive process, and it can be drawn the same way with a computer.





Co-funded by the
Erasmus+ Programme
of the European Union

Now we expand 2D to 3D case with the program TINKERCAD
and print out model with 3D printer !



Fill in the self-assessment chart !

Criteria	Yes (3 points)	No (0 points)	Partly (1-2 points)
I listened carefully, heard the instructions			
I know what fractal and Serpinski triangle are			
I succeeded in constructing the 3D Serpinski triangle using TINKERCAD			
The tasks were interesting and challenging			

THANK YOU FOR YOUR WORK!