

FANTASTIC FRACTALS

How a Sierpinski Tetrahedron is Built

Stage 0



The smallest tetrahedron is made from 6 balloons, each 25 centimetres

Double the length
We call this scaling by a factor of 2.

What is the area scaling?
What is the volume scaling?

Stage 1



The next tetrahedron is made from 4 of the small tetrahedra. We call it the

Then 4 of these bigger tetrahedra are used to make the next one and 4 of those to make the next one and so on, and so on.
Imagine this going on for ever.

At each stage of the construction, 4 tetrahedra are used to make a bigger tetrahedron and the lengths of the edges are doubled each time.

Stage 3



How long are the edges of the stage 3 tetrahedron?
How many 50 cm tetrahedra make up the stage 3 tetrahedron?

Hint: The picture of the Stage 2, 1 metre tetrahedron is not shown.

Stage 4



How long are the edges of the stage 4 tetrahedron?
How many 2 metre tetrahedra make up the stage 4 tetrahedron?

If none of the balloons burst, how many 25 cm balloons will be used at each stage?
Starting with a 25 centimetre tetrahedron, how many stages would you need before you reached the moon – from one tip (vertex) touching Earth to the other tip (vertex) touching the moon?

The moon is approximately 385,000,000 (385 million) metres away.