FRAME 1
The following is a geometric interpretation of the geometric series. We will assume you have already seen an algebraic derivation of this result, that is, that this infinite sum is equal to the ratio a over 1 minus r.

FRAME 2
Suppose we have a right-angle triangle with base a.

FRAME 3
Let us now draw a square, with sides of length a, as shown in the diagram.

FRAME 4
The length of the red line (that lies between the intersection of the square and the hypotenuse, and the side of the black triangle) is less than a. Let this distance be a times r, where r is between 0 and 1.

FRAME 5
Now draw another square whose base lies on top of the first square, as shown in the diagram. The length of each side of the new square is a times r.

FRAME 6
Using similar triangles, it can be shown that the length of the new red line is a times r squared.

FRAME 6
It follows that the next square will have sides of length a times r squared.

FRAME 7
The next square has sides of length a times r cubed, and so on.

FRAME 8
Finally, let us ask, what is the height, h, of our right angled triangle? Well, h is equal to an infinite series, which happens to be, by construction, our geometric series. In other words, the sum of our geometric series is equal to the height of a right angled triangle with base a.

FRAME 9
Moreover, by similar triangles, comparing the black to the purple triangle, h is equal to a over 1 minus r, which is in agreement with our algebraic derivation.

FRAME 10
The conclusion of this demonstration are twofold. Firstly, we can think of the geometric series as an expression for the height of a right angled triangle with base a. Secondly, that the height of the triangle can be derived using a geometric approach that utilizes similar triangles.