

Don't tie yourself in a knot

An activity by Johnny Ball

For Number Day, you're going to tackle creating an evenly spaced knotted piece of string. When you do, you'll be holding a piece of history in your hands.

A knotted string or rope like this would have helped builders down the ages, measure lengths and distances, make circles and arcs, as well as forming perfect right angles for square shapes like tabletops, or the square corners for buildings.

The Egyptians use knotted string to measure areas of land. The Nile flooded each year, but when the floods subsided, the land had now been naturally fertilized by the nutrients in the water. So, they would use knotted string to divide their newly fertilized farmland equally between farmers.

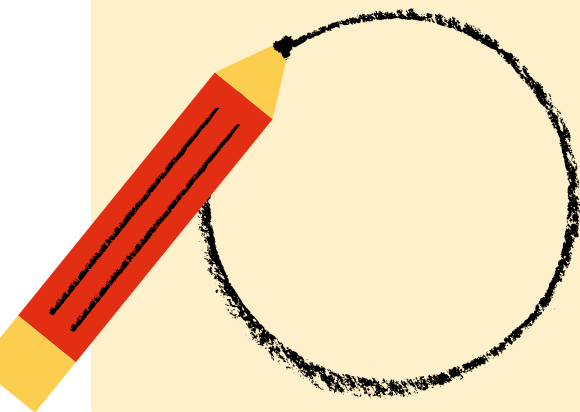
The Egyptians had learnt to use mathematics to help in everything they did.

Your teacher will take you through how to create your knotted string. Once you've created it, you could try out these activities.



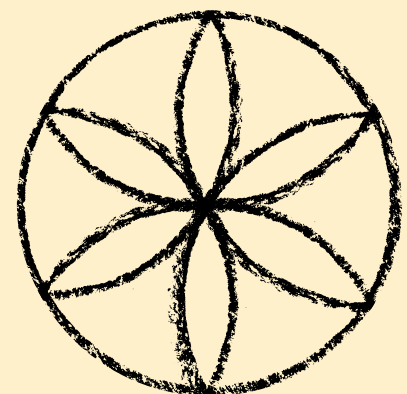
Practice making arcs:

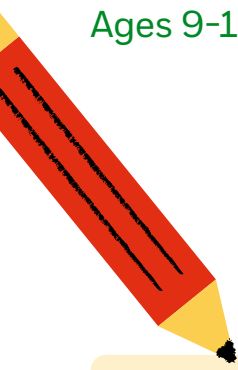
- First hold a knot on one spot.
- Now, with a pencil tip held by or even through any knot, some distance away, you can use your string as a pair of compasses to make perfect arced curves, or even complete circles.



Make some patterns:

- Using exactly the same radius every time, you can make a circle with six petals inside it.
- There are lots of other designs you can make, using your string as a pair of compasses to make circles and circular arcs.



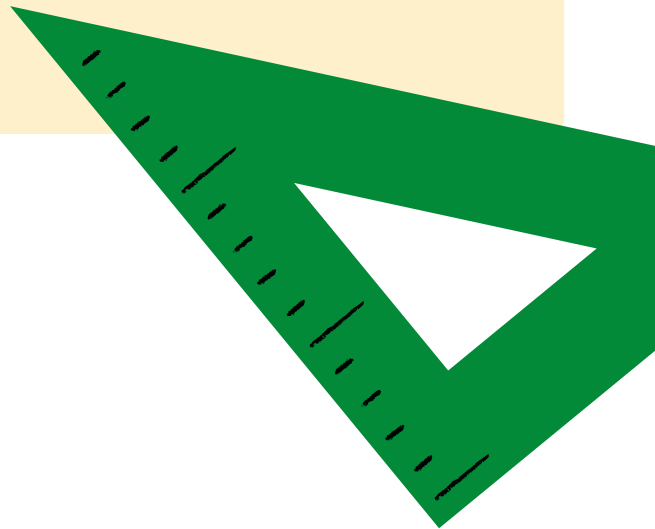


Make a 3, 4, 5 right-angled triangle:

- Find the 13th knot on your string and grip it in your fingers with the very first knot.
- From this point, stretch a four-unit length forming a straight line.
- Now stretch the string so it forms a triangle with sides of unit lengths 3, 4 and 5.
- The angle between sides 3 and 4, will be a perfect right-angled triangle.
- Making dots for the angles, and then using a ruler, you can complete your 3, 4, 5 triangle drawings.

Make chocolate bar shapes:

- Once you have a 3, 4, 5 triangle, you can construct another alongside, to produce a chocolate bar shape of three rows of four squares.
- By repeating this, you can make chocolate bar patterns as large as you like.
- You might try making an 8 x 8 chess board!



SUMMING UP

You've hopefully seen how an evenly knotted string makes a very useful tool. You can use it to create patterns, triangles, and even use it as a pair of compasses!

You could see if you can use it in your other Number Day activities.

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