

# YEAR 6 SPIRALS PROJECT

## TASK 1 - SPIRALS IN CIRCLES (SPIRALS POWERPOINT 2)

You will be using concentric circles to help you to draw spirals.

Concentric circles divided into six sectors.

- How many degrees are there in a full turn?
- How can we find out how many degrees there are in each of the six angles at the centre of the circle?
- How many degrees are there in each of the angles at the centre of the circle?

The Powerpoint slides demonstrate how to draw a spiral. Start at the point where one of the radii crosses the outside circle. Using a coloured pencil or pen and moving clockwise, draw a line to the point where the next radius meets the second circle. Continue as shown on the slides to the centre of the circles.

Another spiral can be drawn in the same way starting at the point where another radius meets the outside circle.

Spiral patterns can be produced by drawing spirals going both clockwise and anticlockwise on the same diagram.

## TASK 2 - SPIRALS IN SQUARES (SPIRALS POWERPOINT 3)

To do this activity, we need to think about Fractions of a whole.

What fraction of the square has been shaded?

There are 6 squares on the slide which appear one at a time.

After each square appears work out how much of the square is yellow. For the first few squares you can work out how much of the square is coloured as a decimal number and as a percentage, but these become difficult numbers for the 5<sup>th</sup> and 6<sup>th</sup> squares.

Continue the sequence of numbers. How does this sequence work?

The first three terms in the sequence are given.

Draw a square with sides 16cm long (You can use a template for this which is included if you prefer).

What is the area of the square?

- What do we mean by area?
- What kind of units are used to measure area?
- How can we find the area of the square?
- What is the area of the square?

You could keep a record of the size of each successive square to enable them to see the pattern in the numbers. A table has been provided for this in the templates. This table can be continued beyond the number of squares drawn.

Mark the midpoint of each side of the square.

Ask the pupils to join the midpoints they have drawn to form a second square.

- Without measuring can you find the area of the new square?

Mark the midpoint of each side of the new square and to join these midpoints to make a third square. Continue to the centre.

Repeat with other shapes.

### **TASK 3 - DRAWING FIBONACCI SPIRALS (POWERPOINT 4)**

This slide gives the first five numbers of the Fibonacci sequence. Look at these numbers and to say what the next number in the sequence will be.

The next number in the sequence is found by adding the two previous numbers.

**Fibonacci numbers can be found in many places, for example the number of petals on a flower is often a Fibonacci number.**

**The numbers in the Fibonacci sequence can be used to form a spiral. This spiral can be found in natural things and is sometimes called the golden spiral.**

The following sequence of slides shows how to construct a Fibonacci spiral. This is easiest to produce if 1cm squared paper is used. Squared paper is provided in the templates. A page has been provided with the first two squares drawn in so that the you know where to begin to fit the spiral on the page. You may find it helpful to have a list of Fibonacci numbers available while you are working on this spiral.

0 , 1 , 1 , 2 , 3 , 5 , 8 , 13 , 21 , 34 , 55 , ...

It is not possible to draw a square with side length 0cm so the first two squares each have side length 1 cm.

Ask the pupils to continue by drawing a square with side length 2cm to the left of the two squares.