Learning objective: we are learning to use variables in programs.

Context

Turtlestitch is a free, easy-to-use platform found at www.turtlestitch.org. Using block-based code similar to Scratch and Snap!, it is designed for writing programs to control embroidery machines, but you don't need an embroidery machine in school to get a lot of fun learning from it. It is particularly useful for cross-curricular learning in computing and maths. Using WMG's free maths resources, year 5 and 6 children can apply their understanding in topics such as measure, geometry, division, and position and direction to create patterns onscreen.

Preparation

This lesson is designed to be taught after the missing angles and properties of shapes lessons. There is also an optional year 6 lesson using the highest common factor of two numbers. In the plans for the missing angles lesson, you will find some introductory videos for teachers.

Familiarise yourself with variables using this video. There is also a less detailed instruction card.

Timing	Teaching & learning	Resources
5-10 minutes	**Maths re-cap** Re-cap finding what the children learnt in the missing angles lesson. You could use the first side of the card to do so.	Whiteboard Missing angles card
20 minutes	**Using variables to makes spirals** Show the children how to create a spiral with a variable (as shown in the video you have watched before the lesson). 1. The children should try making spirals based on different shapes, e.g. hexagon, by changing the angle turned in the spiral. 2. Instead of starting from the inside and making the spiral bigger, can they start from the outside and make the spiral smaller?	Variable video
20-30 minutes	**Exploration** Can the children use variables in other ways to create their own patterns? 1. Instead of changing the number of steps moved, could they change the angle turned? What else can they make a variable? 2. Can they combine variables with other blocks. See this example video.	Star spiral video
5 minutes	**Showcase** The children show each other their patterns.	