

Vector Dot-to-Dot Puzzle

Age: 9-13 years

Type: Offline (to be completed without a computer or internet)

Curriculum Links to: Maths

Computational Thinking Concepts & Approaches: Logic and algorithms

Introduction

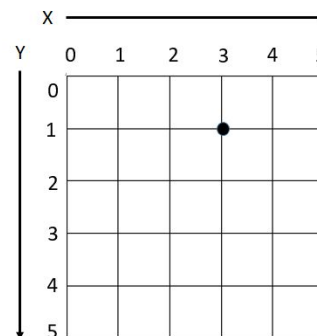
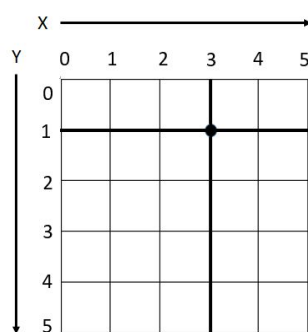
In this offline project, you will learn about vector graphics. Vector graphics is a way of drawing pictures using points, lines and shapes. It is a bit like doing a dot-to-dot puzzle and colouring it.

What you will learn

Through this project you will learn more about writing algorithms. Algorithms are a sequence of well-defined instructions that can be implemented by a computer.

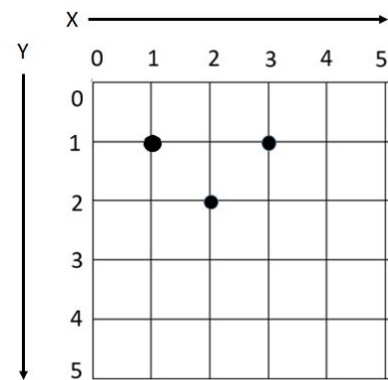
Dot-to-dot puzzle

To draw a shape using vector graphics, follow the instructions and place dots at all the points given in the instructions. For example, the instructions `red (3,1) (2,2) (1,1)` means that you would first place a dot at (3,1) which lies at the intersection of the X-axis (horizontal) marked 3 and Y-axis (vertical) marked 1.

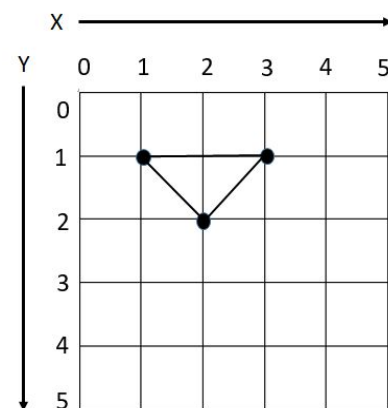


Computers represent everything, even pictures, with numbers. This means that when you design a picture for a computer, you need to turn the picture's pixels into numbers. The grid numbering starts at (0, 0) in the top left-hand corner of the grid. This is because computers use the same (x, y) coordinates as old-fashioned televisions, which display images in horizontal lines from left to right, starting at the top and moving downwards.

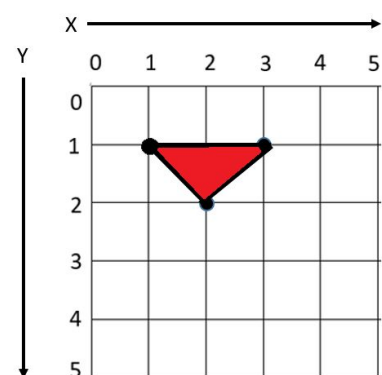
Next, place dots at (2,2) and (1,1) as given in the instruction `red (3,1) (2,2) (1,1)`



After you are done placing all the dots, join them in the exact order given in the steps finishing back at the start.



Finally colour in with the colour mentioned in the instruction `red (3,1) (2,2) (1,1)`. In this case you would colour with red!

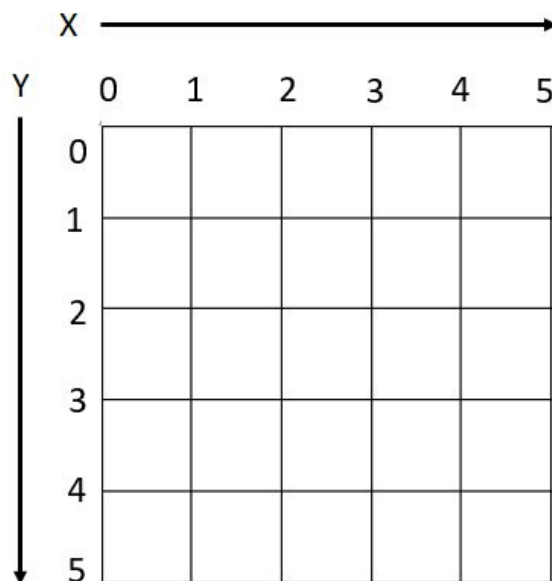


Solve

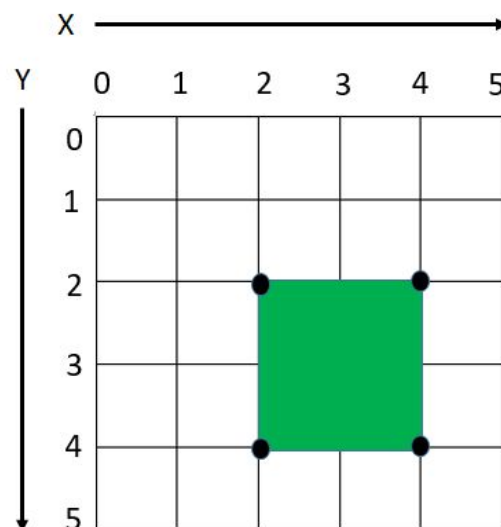
Now draw a picture using the instructions given below. Remember to follow instructions in the order in which they are given. Remember to also join the dots in the exact order given in the steps finishing back at the start.

Let's try with a simple one first!

Green (2,2) (4,2) (4,4) (2,4)

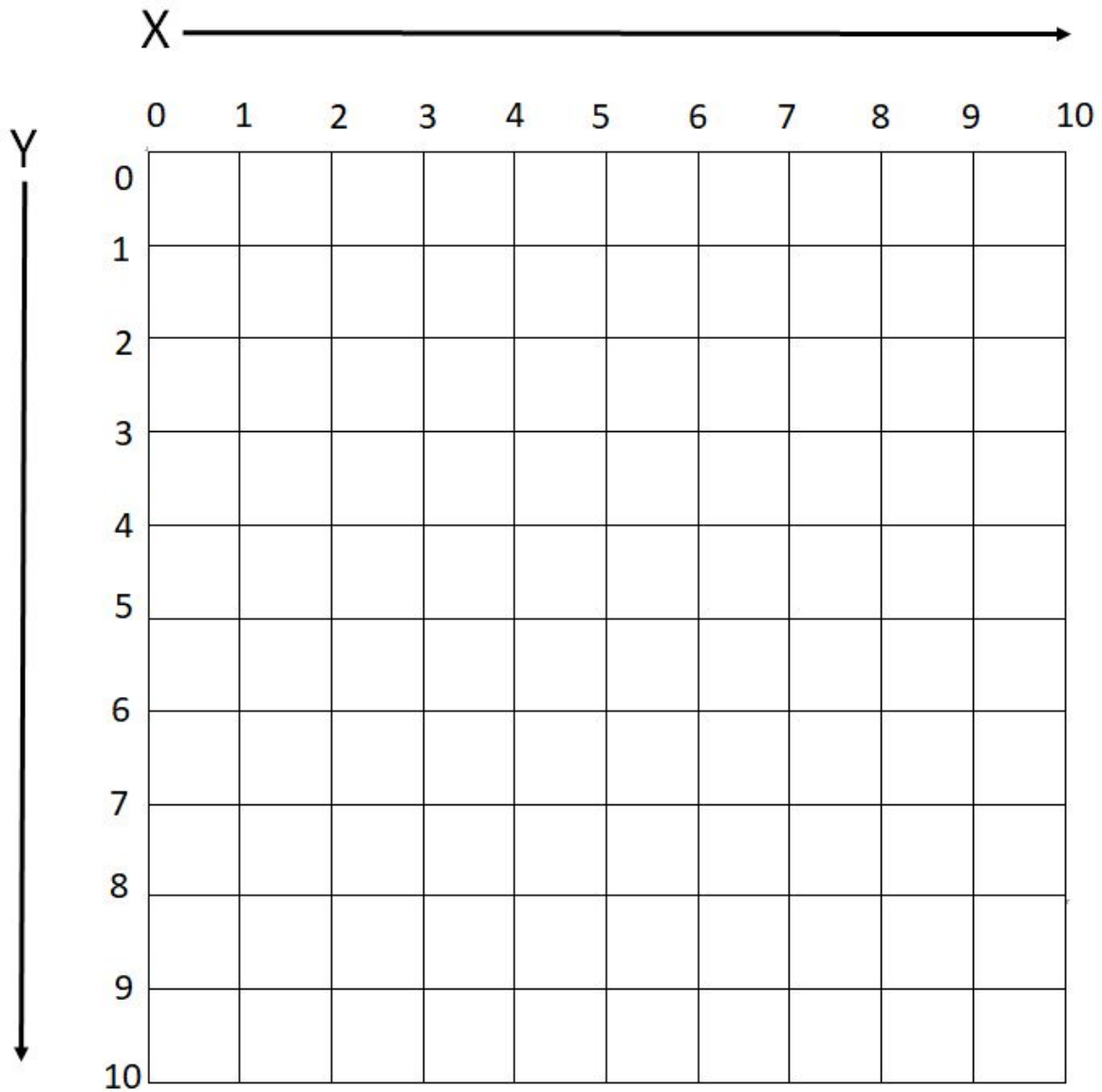


Here is the solution for the above puzzle!

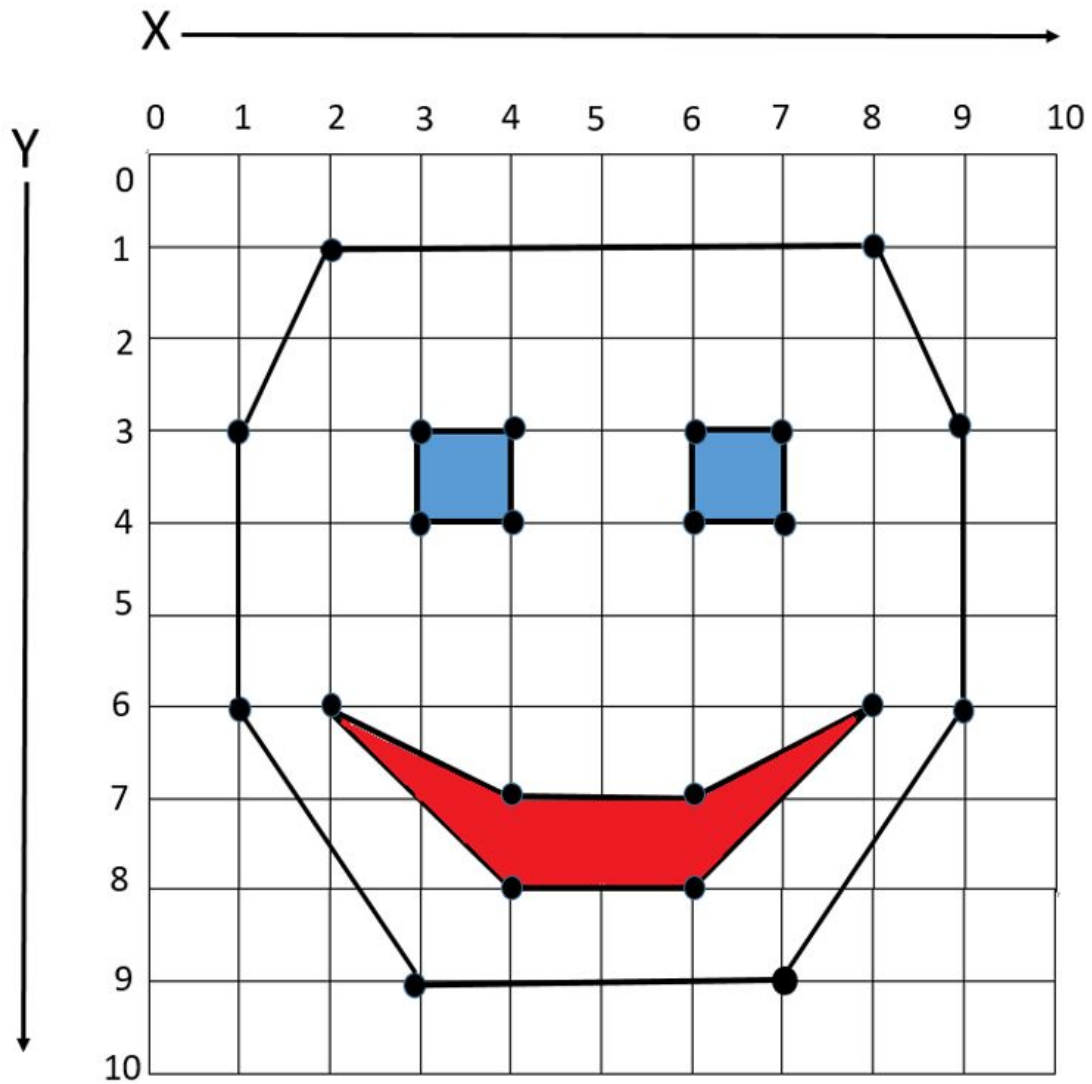


Let's take it one step further and try to draw a picture with more than one instruction.
Remember to follow instructions in the order in which they are given!

white	(2,1)	(1,3)	(1,6)	(3,9)	(7,9)	(9,6)	(9,3)	(8,1)
blue	(6,3)	(6,4)	(7,4)	(7,3)				
blue	(3,3)	(3,4)	(4,4)	(4,3)				
red	(2,6)	(4,8)	(6,8)	(8,6)	(6,7)	(4,7)		



Solution



This activity was originally created by Barefoot Computing -
<https://www.barefootcomputing.org/>