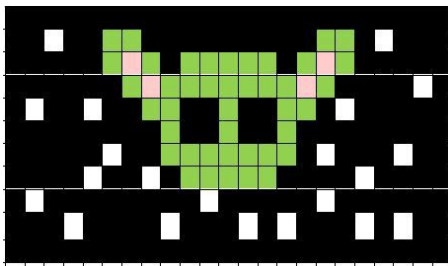


Overview



Did you know that all images that you see on computer screens are made up of tiny squares called pixels? In this activity you will use a pencil, a ruler and some colouring pens to create your own pixel art.

What you'll need

- Paper
- Pencil
- Ruler
- Felt tips, colouring pencils, felt tips.

Alternatively, you can print out these PDF grids or create your own 10 x 10 grid in Word.

Suitable for:

Age 5 and up – with younger children, you will need to make or print the grid for them.

Duration:

About 10 minutes

Safety notes

You know your children better than anyone, and you should judge whether they're ready for this activity.

[More STEM at Home](#)

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Games designer

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What to do

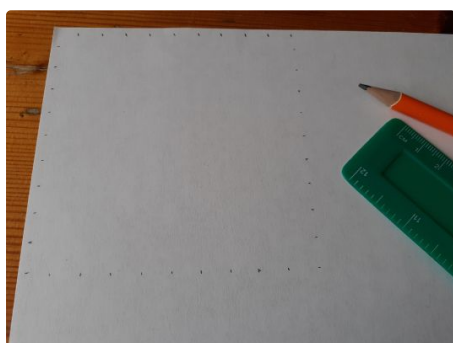
Step 1



First you need a grid. You can print one out using this link and then go to Step 5, or you can make your own.

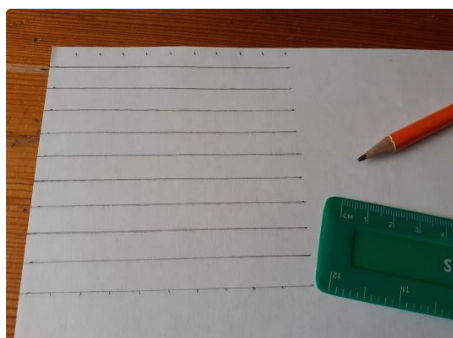
To draw your own grid, put the 0 on your ruler on the edge of your page in the top, left-hand corner. Make a mark with your pencil every centimetre. Stop when you reach 10 cm.

Step 2



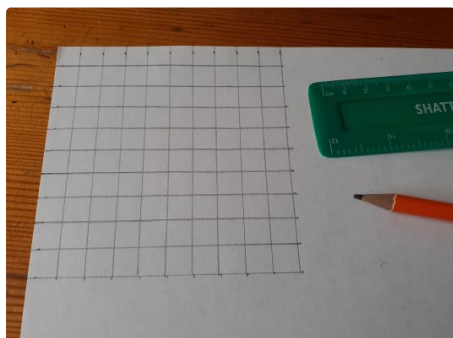
Mark off 10 centimetres down the side of your page. Next, mark off 10 across your page, starting from your bottom dot. Finally, mark off the centimetres going down the page so that the dots create the outline of a square.

Step 3



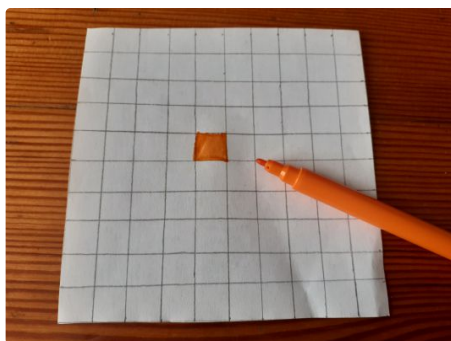
Join the dots opposite each other, with a pencil line across the square. Remember to use your ruler!

Step 4



Join the dot on the other sides using your pencil and ruler. Now you have your grid.

Step 5



Colour in the squares on your grid to create your picture.

Step 6

You could start by making some simple designs like shapes to begin with.



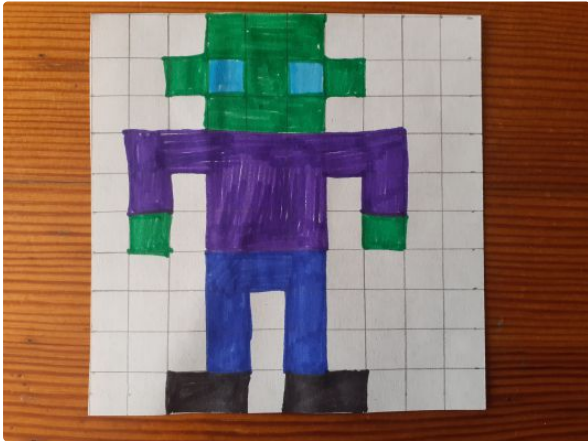
Step 7



Then try some more complicated pictures.



Step 8



Finally, think about using different colours in your design. Remember that each square can only be one colour.

THINGS TO DISCUSS

How easy is it to create the pixel design that you want using a grid?

Did you find straight lines or curves easier to make?

Do you think it would be easier or more difficult if you had a bigger grid?

HOW IT WORKS

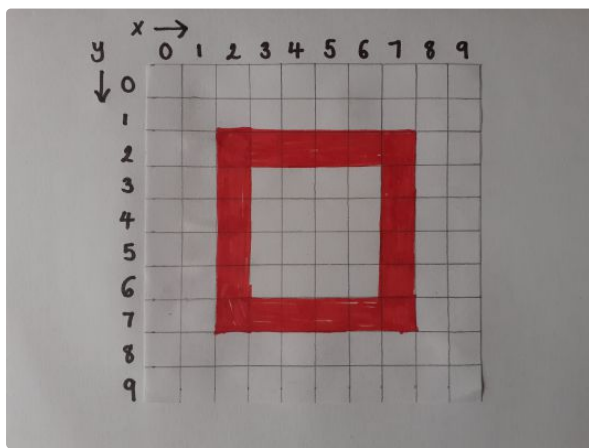
Computer screens are made up of a grid of tiny squares called pixels (picture elements). All the images you see on screen are made up of these tiny squares. Computer screens have different numbers of pixels depending on their size. This can be worked out by looking at your screen resolution. A mobile phone may have a resolution of 360 x 640. This is 230,400 pixels on screen. A laptop may have a resolution of 1920 x 1080. This is 2,073,600 pixels on the screen. The more pixels you have, the better quality your picture is.

OTHER THINGS TO TRY

Using coordinates to code pixels

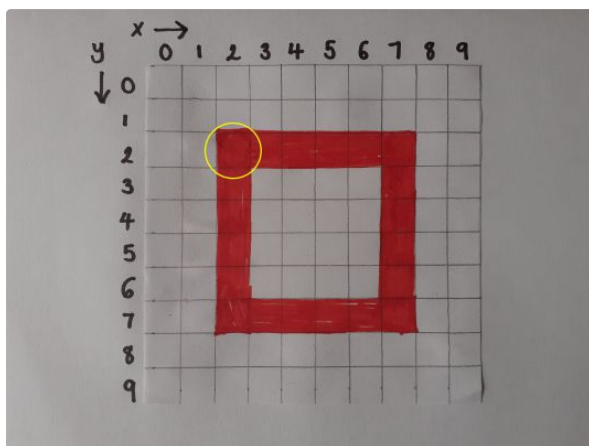
Computers represent everything using numbers. They use coordinates to represent pixels. When computers read the coordinates of pixels, they start in the top, left hand corner. When you read the coordinates of a map, you start in the bottom, left hand corner.

Step 1



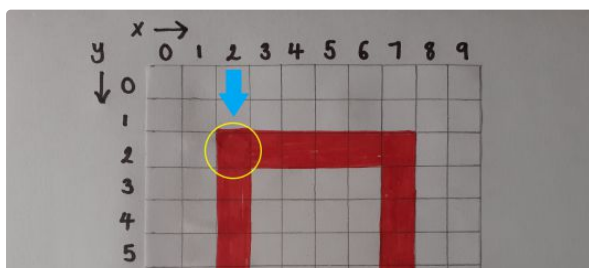
Start off with one of your simpler designs, the one with the fewest coloured squares. Label your x and y axis with number 0 to 9, as shown in the photograph.

Step 2

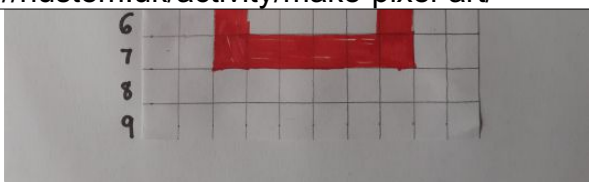


Find the pixel nearest to the top, left hand corner. The photograph shows the first pixel that the computer will read.

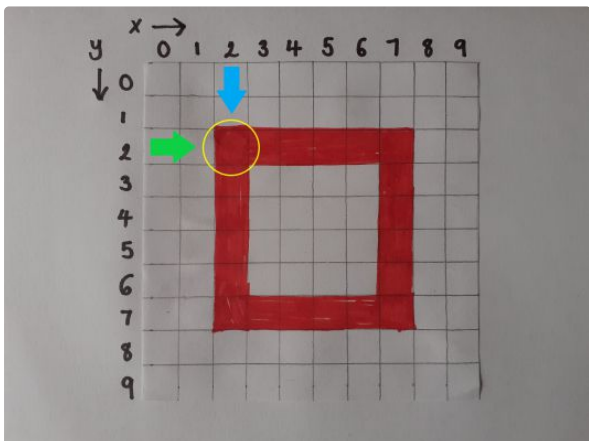
Step 3



Go along the x axis until you find the number column that your pixel is in. In the photograph you can see from the blue arrow that this is 2.



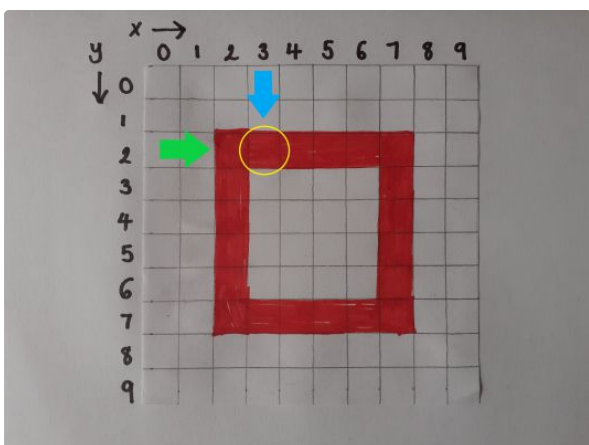
Step 4



Now go down the y axis until you find the row your pixel is in. You can see from the green arrow that this is 2 also.

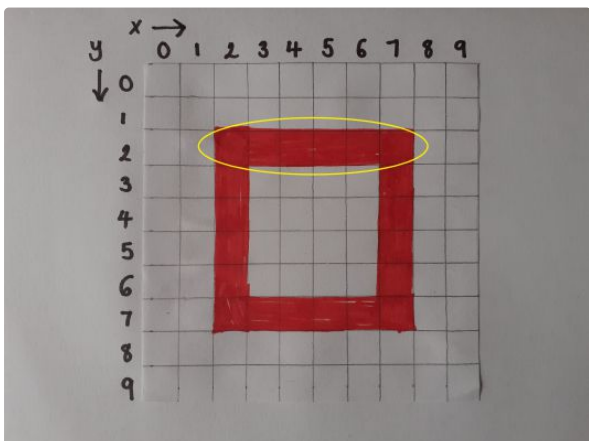
We record these coordinates like this: (2,2).

Step 5



The computer reads the coordinates in horizontal lines, from left to right, top to bottom. The next pixel that the computer will read in this design is marked on the photograph. Read the blue arrow to find the x axis coordinate and the green arrow to find the y axis coordinate. This pixel will be recorded as (3,2).

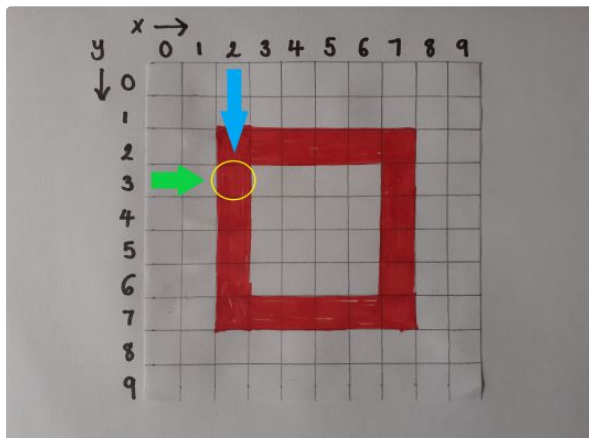
Step 6



Continue across the entire first row of pixels. The computer would read the coordinates in the photograph as:

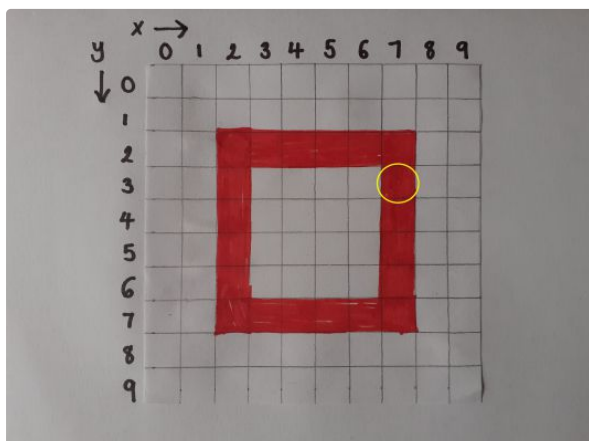
(2,2) (3,2) (4,2) (5,2) (6,2) (7,2)

Step 7



The computer reads the coordinates in horizontal lines, from left to right, top to bottom. The next pixel it will read is (2,3).

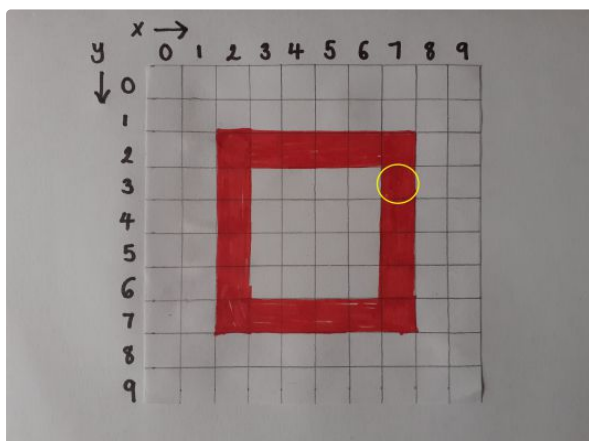
Step 8



In this design, there is a gap of no pixels to read, so we skip straight to the next pixel on that row. In this design, that coordinate is (7,3). So, the second row of the design would have the coordinates:

(2,3) (7,3).

Step 9



Continue recording the coordinates of your design in horizontal lines, moving from left to right, top to bottom. The final pixel the computer will read in our design is circled in the photograph. The coordinates for our entire design would be:

(2,2) (3,2) (4,2) (5,2) (6,2) (7,2)

(2,3) (7,3)

(2,4) (7,4)

(2,5) (7,5)

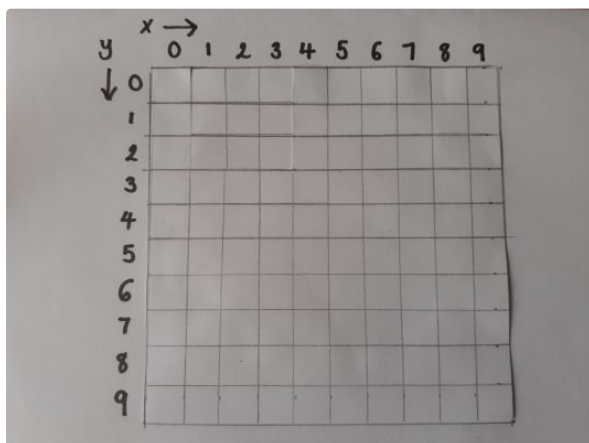
(2,6) (7,6)

(2,7) (3,7) (4,7) (5,7) (6,7) (7,7)

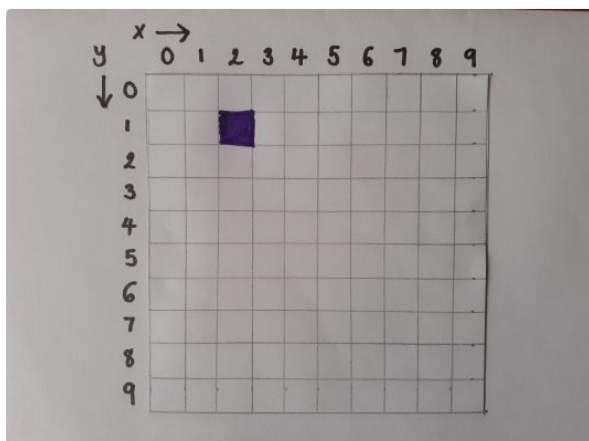
Can you record the coordinates of one of your pixel pictures? Remember to use a new line for each horizontal row of coordinates.

OTHER THINGS TO TRY

Can you plot these coordinates on a grid? You will make one of the designs already featured on this page



Make yourself a grid with the x and y axis labelled.



Plot these coordinates, remembering to plot the x then the y axis. The first one is done for you.

(2,1) (4,1) (5,1)

(2,2) (3,2) (6,2)

(2,3) (7,3)

(1,4) (8,4)

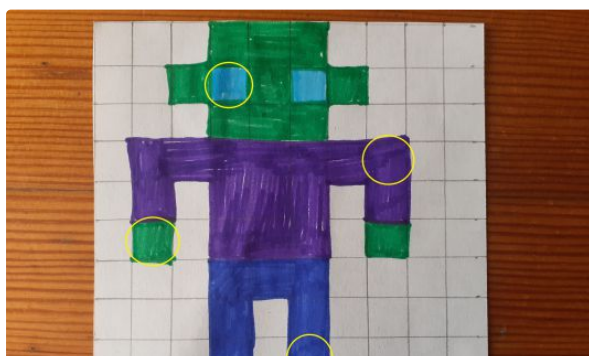
(1,5) (3,5) (5,5) (6,5) (8,5)

(1,6) (3,6) (5,6) (6,6) (8,6)

(1,7) (5,7) (6,7) (8,7)

(1,8) (2,8) (3,8) (4,8) (5,8) (6,8) (7,8) (8,8)

Other things to try: making colour pixels



You can tell the computer to make the pixels a colour by adding an instruction to the code.

In the photograph, the circled pixels would be

(3,1t) where t is turquoise

(7,3p) where p is purple

(1,5g) where g is green



(5,8b) where b is blue

(2,9bk) where bk is black