

CURIOSITY AT HOME

DRAW LIKE A COMPUTER

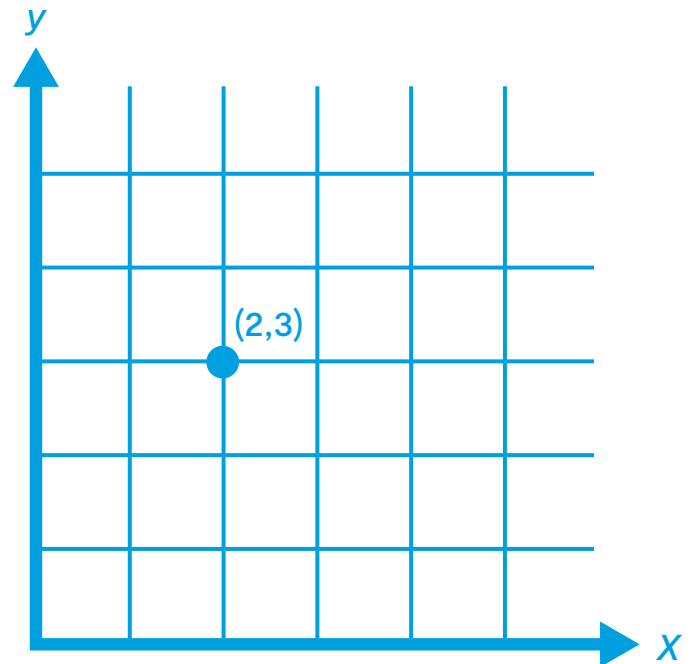
Have you ever wondered how computers make pictures appear on the screen? Computers use special codes to help them “know” how to draw a picture. Try decoding a secret image for yourself and learn to draw like a computer.

MATERIALS

- 3 sheets of graph paper or 3 copies of printout (included in this document)
- Glue or tape
- Science notebook or paper
- Something to write with

PROCEDURE

- Print the sheet of graph paper included below or copy the numbering system onto your own sheet of graph paper.
- In these instructions, points on the grid will be marked (x,y) , where x is the distance to the right of the corner $(0,0)$, and y is the distance up from $(0,0)$.
 - For example, a point labelled $(2,3)$ would be two to the right, and three up.
- Draw a picture following these instructions to decode the hidden image.
 - Draw four dots at $(0,5)$, $(5,10)$, $(10,5)$ and $(5,0)$. Draw a circle that goes through these four points.
 - Draw two large dots at $(3,6)$ and $(7,6)$
 - Draw three dots at $(2,4)$, $(5,2)$, and $(8,4)$. Draw a curve that goes through these three points.
 - Glue or tape your finished drawing into your science notebook.



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EXPLORE MORE

- Try designing your own image and encoding it for someone else to draw.
 - Print another copy of the numbered grid system, or copy the numbering system onto your own sheet of graph paper.
 - Draw a design made of simple shapes that go through points on the graph paper.
 - Write down instructions for how to draw your design by listing out points on the graph and explaining how to connect the points.
 - Give a friend another numbered sheet of graph paper and teach them how to decode messages.
 - Either give your friend the instructions you wrote, or verbally tell them how to draw the picture using points and connecting lines on the grid.
 - Look at your friend's drawing. Did they draw the same thing as you? If not, how do you need to change your instructions so they can get it right next time?
- Glue or tape the finished drawing into your science notebook, alongside any written instructions.

DID YOU KNOW?

Computers don't automatically know real-world objects, so you can't just tell a computer to "draw a flower". Computer scientists tell the computer what to draw onscreen using encoded information like you did in this activity. The computer then reads the code, interprets the message, and draws the picture on the screen in response.



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K–2 GRADE EXPLORATION

- Why do you think people use code to talk to computers?
- Try giving the same set of drawing instructions to more than one person. Did they draw the same thing? Why or why not?
- Can you break your instructions down into even smaller steps to make sure everyone gets the same end drawing?
- What are some other things you can tell a computer to do?



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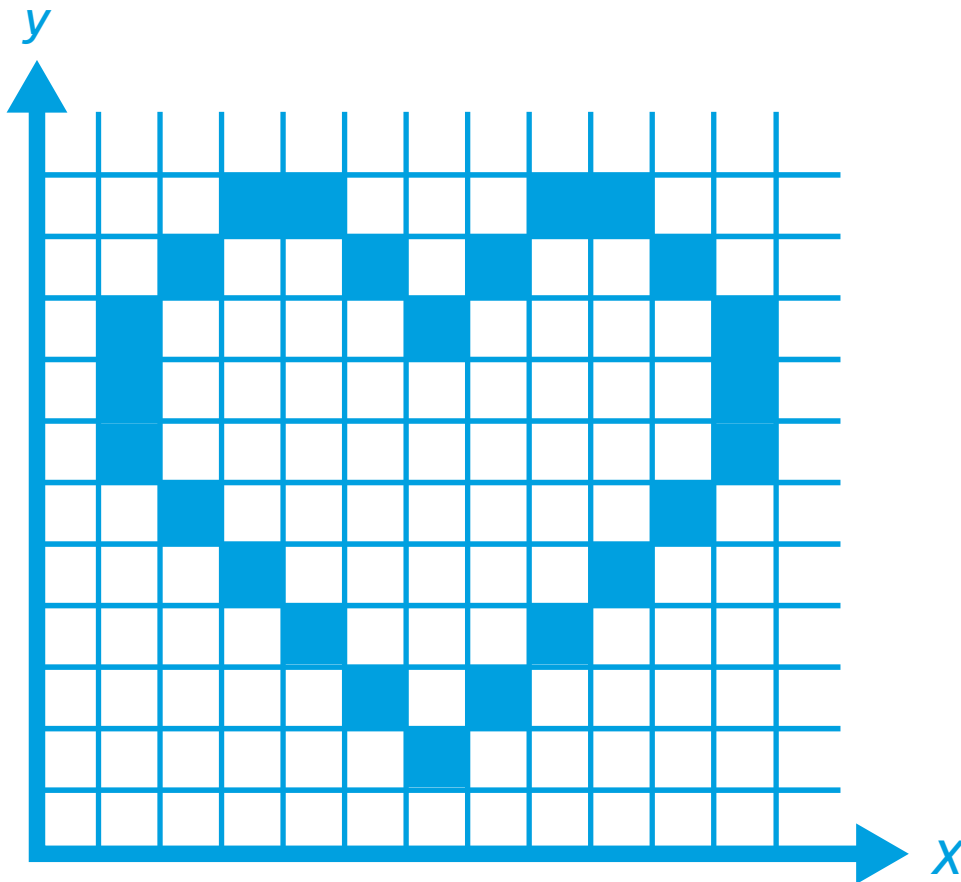


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3–5 GRADE EXPLORATION

- Try giving the same set of drawing instructions to more than one person. Did they draw the same thing? Why or why not?
- Can you break your instructions down into even smaller steps to make sure everyone gets the same end drawing?
- Computer screens display visual information with tiny points of light called pixels. Try drawing an image out of pixels by filling in individual squares on your grid. Then encode the instructions so someone else can copy your drawing.



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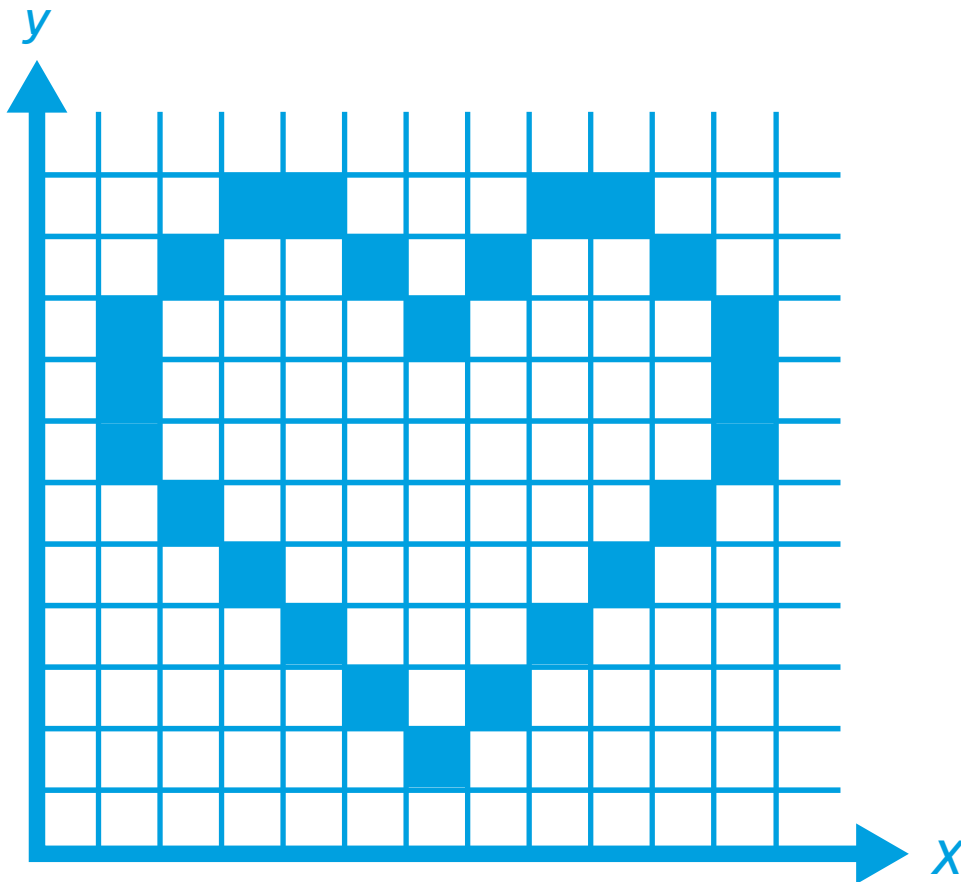


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6–8 GRADE EXPLORATION

- Try giving the same set of drawing instructions to more than one person. Did they draw the same thing? Why or why not?
- Can you break your instructions down into even smaller steps to make sure everyone gets the same end drawing?
- Computer screens display visual information with tiny points of light called pixels. Try drawing an image out of pixels by filling in individual squares on your grid. Then encode the instructions so someone else can copy your drawing.



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