



FLOSS

MANUALS

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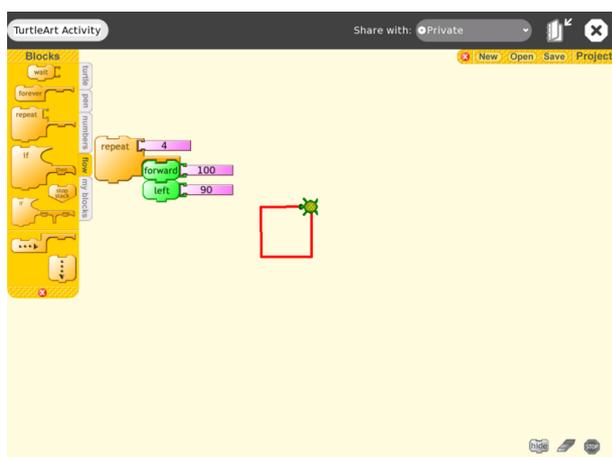
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Learning with Turtle Art



Play with Turtle Art to draw colorful art patterns using a turtle that accepts instructions for movement.

With visual programming blocks, you can snap together programs by compiling (combining) them in ways to create anything you can imagine.



What am I learning?

You are learning how to build a set of instructions for a pretend turtle to follow. With repeating instructions and conditional following of the instructions, your pretend turtle can draw shapes and lines over and over again with interesting results.

Why is this important?

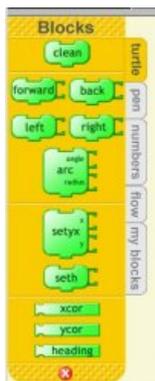
You learn to predict what each instruction will cause the turtle to create with line art. It helps you detect patterns, understand the repetition of instructions, and understand following instructions only when a certain condition is met, which is important in computer programming, mathematics, and science.

Getting Started

Turtle Art allows you to create drawings using the Logo programming language. You can see what programmers do to make programs by giving the turtle programming commands.

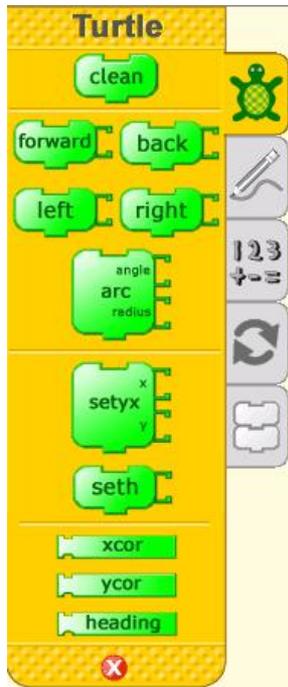


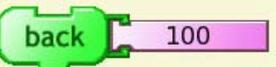
Start by clicking on the + on the Blocks menu to see the tools you use to create your drawings by moving the turtle and having him draw colored lines.

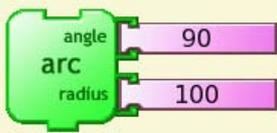
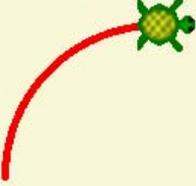


Commands for the Turtle

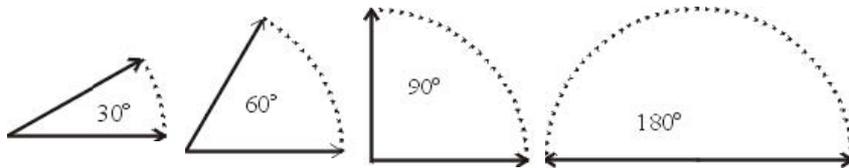
Here are the commands you can give to your turtle on the turtle tab.



	<p>clean - Clears the screen of all drawings and send the turtle to the middle.</p>	
	<p>forward - Moves the turtle forward the number of pixels entered.</p>	
	<p>back - Moves the turtle backward the number of pixels listed.</p>	
	<p>left \hat{a} - Changes the turtle's direction to the turtle's left by the angle specified.</p>	
	<p>right \hat{a} - Changes the turtle's direction to the turtle's right by the angle specified.</p>	

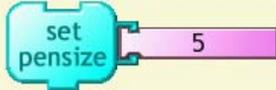
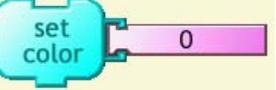
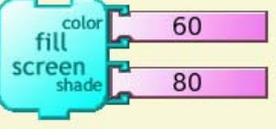
	<p>arc \hat{a} Draws part of a circle. The angle is the part of the circle the turtle draws. The radius determines the width (size) of the circle.</p>	
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Here is a sample of some angles. They can be used for the right and left commands and to draw arcs.



Commands for the turtle's pen

Click on the tab for the pen to see the following tools:

	<p>pu = pen up Picks up the pen so that the turtle does not draw.</p>
	<p>pd = pen down Puts the pen down so that the turtle can draw.</p>
	<p>Set pensize Sets the width of the pen. The larger the number the fatter the line.</p>
	<p>Set color Sets the color of the line that will be drawn. The value can be 0 to 99. See the table for colors.</p>
	<p>Set shade Sets the brightness of the color. 0 will make it blacker. 99 will make it whiter. The example shows color 0 at shade of 0, 50 and 99.</p>
	<p>Fill screen Fills the entire screen with the color and shade shown.</p>

TurtleArt Pen Colors

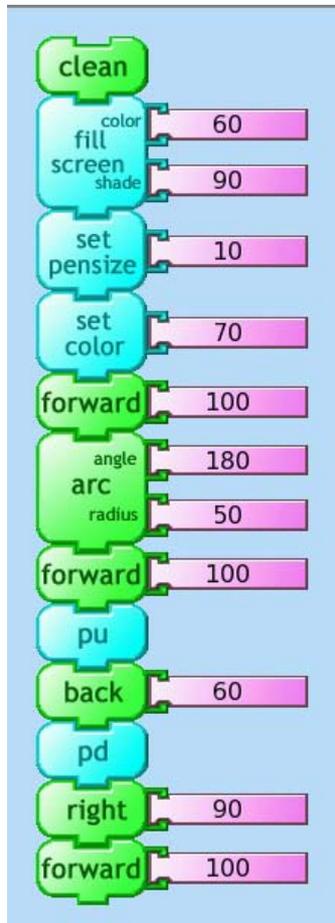
With the SetColor command, you enter a number that represents the colors shown in the table below. If you use SetColor 19, your turtle draws a bright yellow line.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

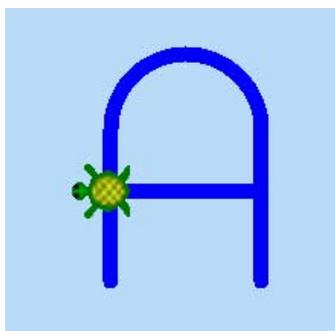
Try Turtle Art

What shape will this set of commands make? Try it and see.

Drag each puzzle piece onto the turtle's floor. Next, click on the bar next to the piece, then type numbers to enter the number values you see, such as color and shade. Once all the pieces are locked together, click the first puzzle piece to start your turtle.

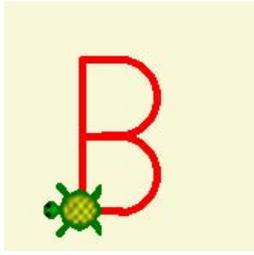


Did your turtle draw this shape?



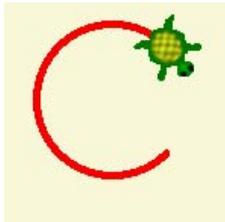
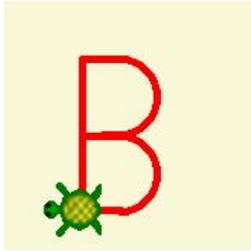
If your turtle didn't draw the shape of an uppercase A, or if the color is different, check each puzzle piece one at a time, pretending that you are the turtle trying to understand the command you gave it. When you see a number or a piece that is out of place, change it and try again.

Here are some more letters your turtle can draw.

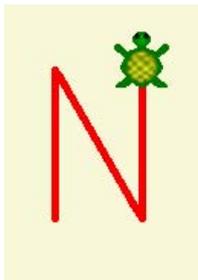


Turtle Art Letters

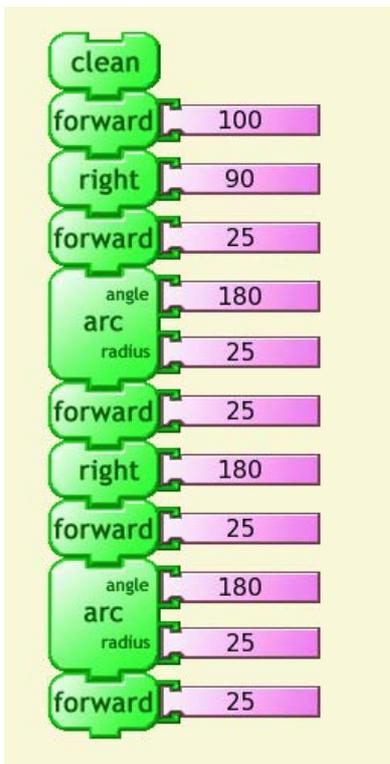
Can you make your turtle draw more letters? Try some of these with curved lines.



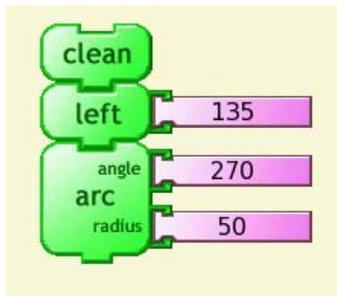
And a capital N has straight lines but drawn at an angle.



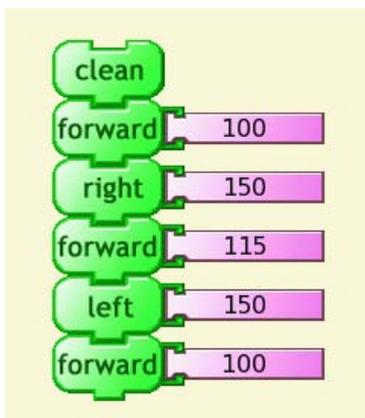
Here's the blocks you'd use to make the letter B. The arc block makes the curved lines.



Here are the blocks to make the letter C, just one turn and an arc.



Here are the blocks to make the letter N.

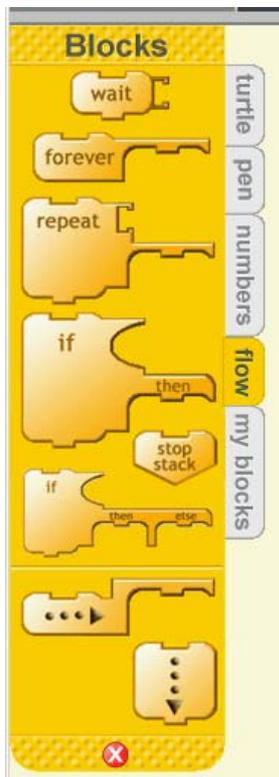


Here's my name, JENNY, spelled by the turtle.

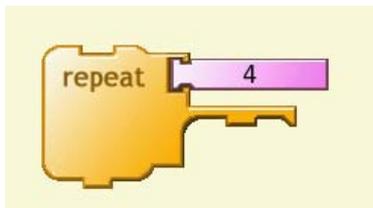


Repeating Commands

Sometimes you want to repeat a set of commands over and over to create a pattern. Use the flow menu blocks to repeat commands to the turtle.

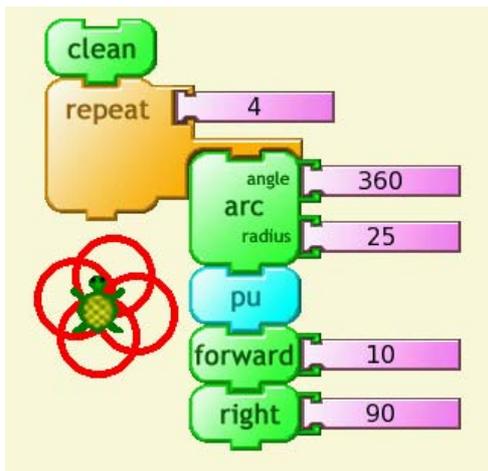


Working with one of the flow commands, repeat, makes the turtle repeatedly draw lines.



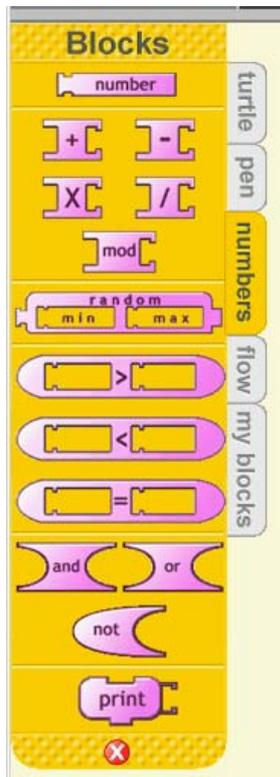
Any commands that are attached to the repeat will be repeated the number of times specified by the number on the top.

This example draws a circle then picks up the pen, moves forward 10 spaces then turns right 90 degrees. This command repeats 4 times.



Numbers Commands

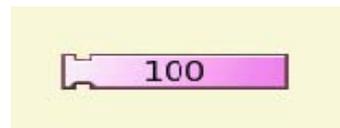
The numbers commands allows you to perform math in your commands.



Number \hat{a} specify the number you want to use in the operation.

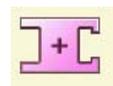
+ - performs addition \hat{a} $5 + 3 = 8$

- - performs subtraction \hat{a} $5 \hat{a}$ $3 = 2$

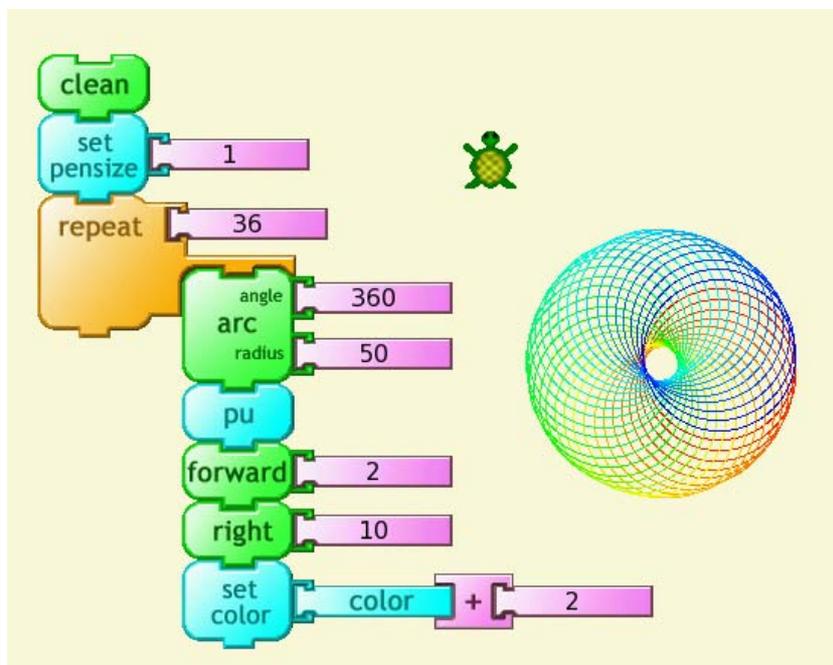


X \hat{a} performs multiplication - $5 \times 3 = 15$

/ - performs division \hat{a} $5 / 3 = 1.67$



mod \hat{a} gets the remainder after division \hat{a} $5 \text{ mod } 3 = 2$ ($5 / 3 = 1 \text{ r. } 2$)

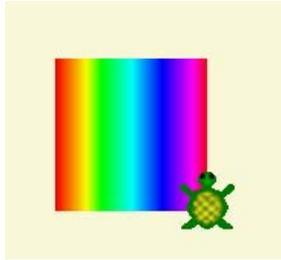


This is similar to the example for the repeat, but in this case we are changing the color each time it repeats. We take the current value of color (which is 0 the first time through) and add 2 to it, giving us 2 for the color on the second loop, 4 for the third and so on.

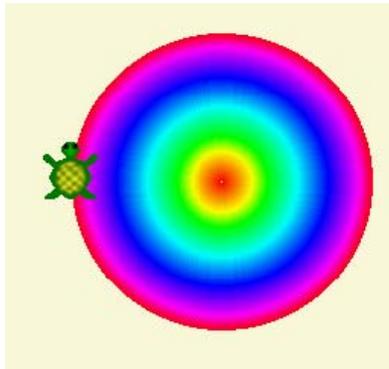
One note on the color: If I increase the color value by 5 each time then when it gets to 99 it starts over again at 0.

Shapes and Spectrums of Colors

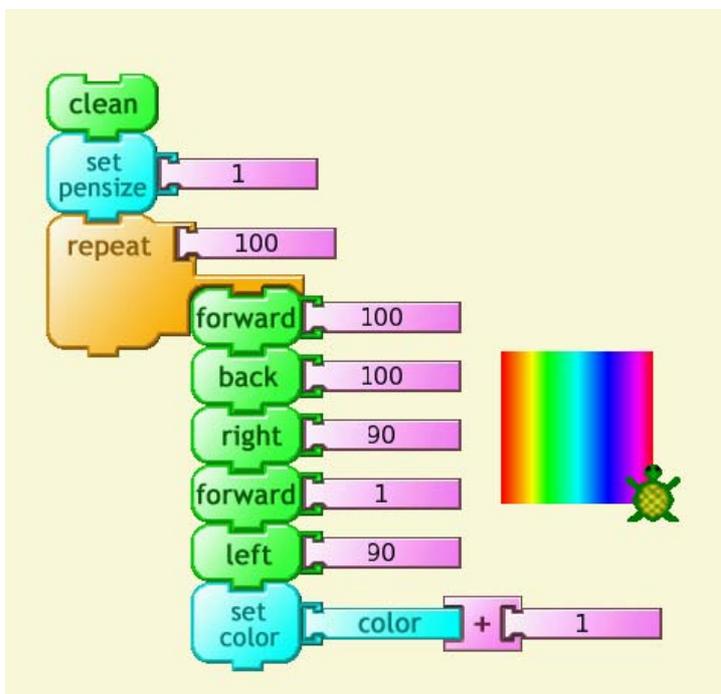
Can you create this?

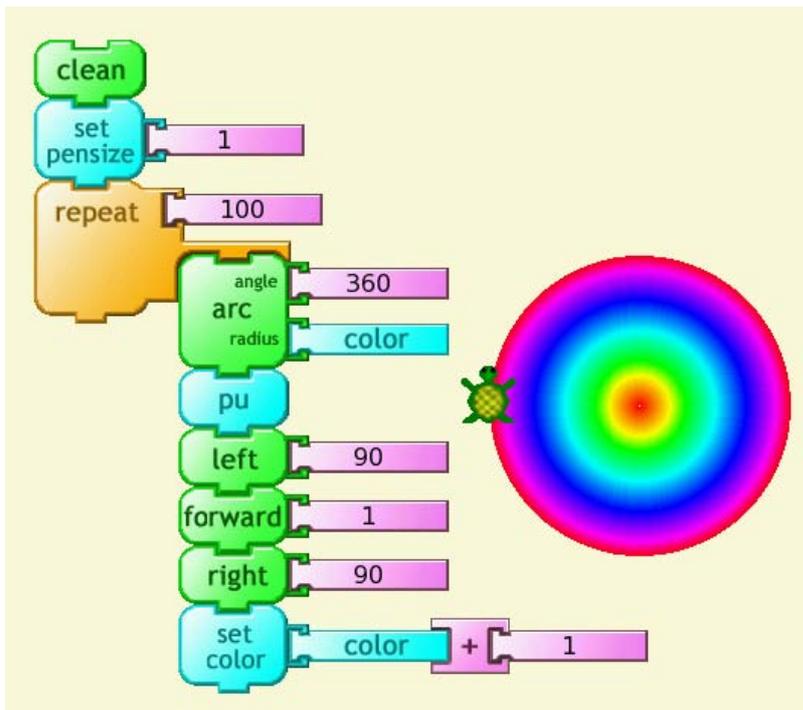


Can you create this?



Solutions





Since the value of a color is a number, you can use that value to set the radius of the circle.

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INTRODUCTION

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