

Turtle Art

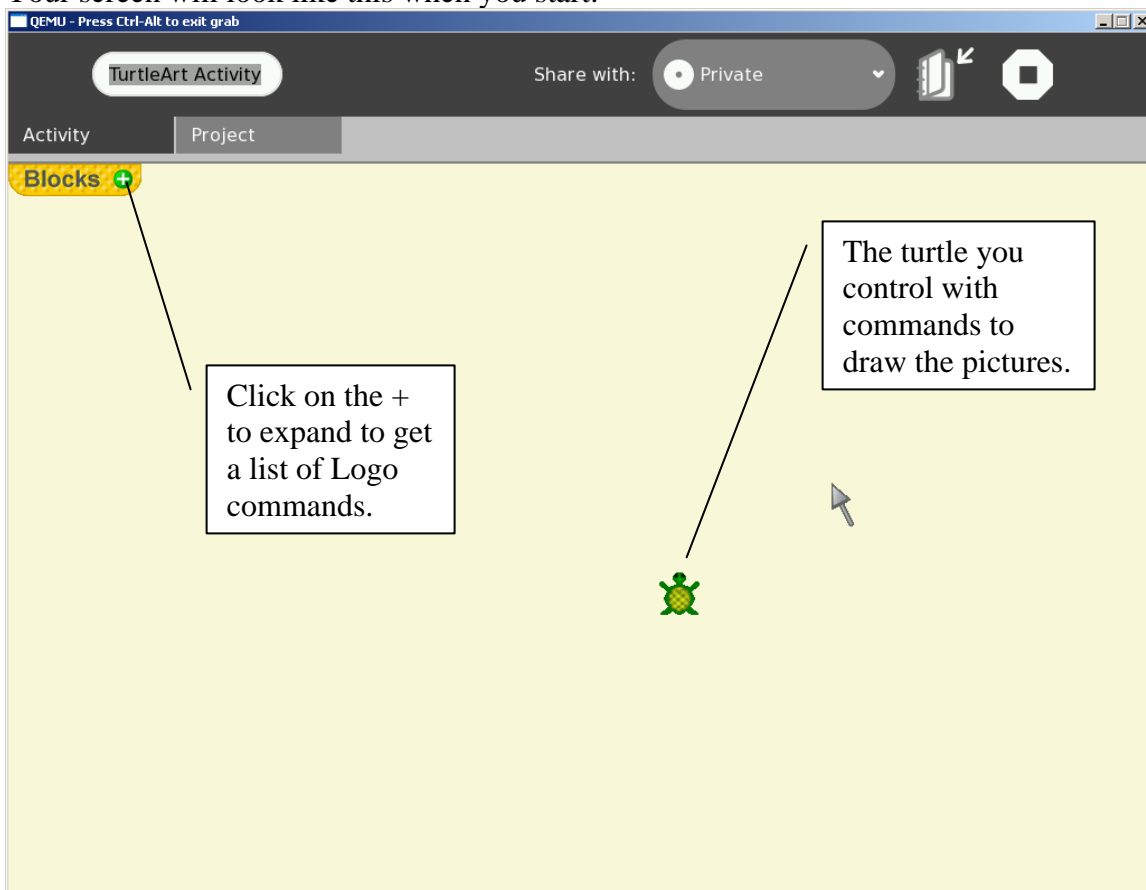
Everything you do on the OLPC is a program written by a programmer.

Turtle Art allows you to create drawings using the Logo programming language. You will get a taste of what programmers do to make programs.

To start Turtle Art, click on the turtle icon in the Home view.

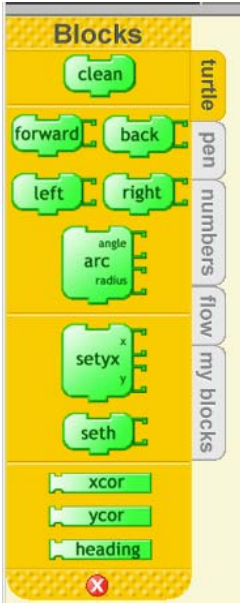


Your screen will look like this when you start:



Start by clicking on the + on the Blocks menu to see the tools you will use to create your drawings.

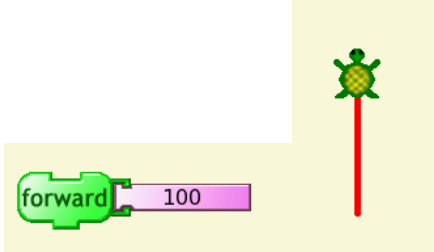
Turtle Commands



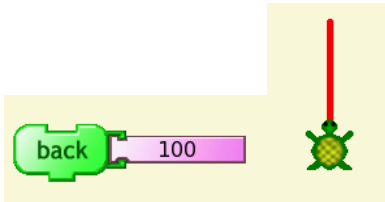
Clean – click on this to clear the screen of all drawings.



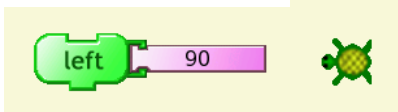
Forward – Moves the turtle forward the number of pixels listed:



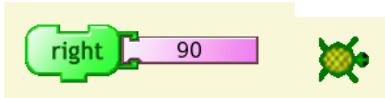
Back – Moves the turtle backward the number of pixels listed:



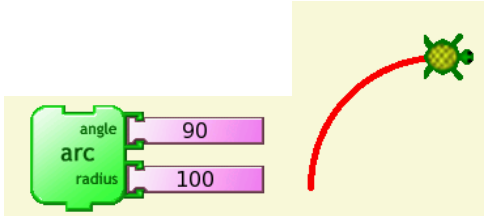
Left – Changes the turtle’s direction to the turtle’s left by the angle specified.



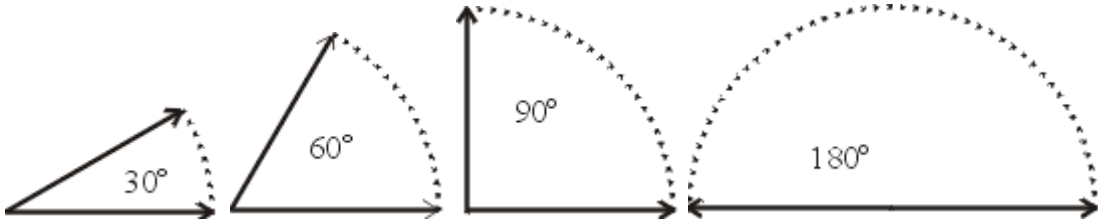
Right – Changes the turtle’s direction to the turtle’s right by the angle specified.



Arc – draws part of a circle. The angle is the part of the circle it will draw. The Radius determines how big the circle is.

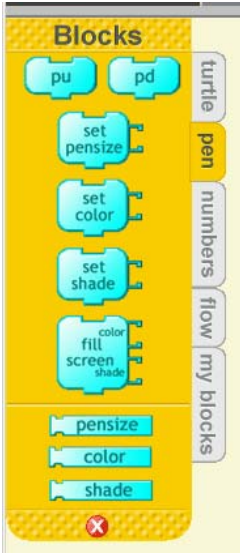


Here is a sample of some angles. They can be used for the right and left commands and to draw arcs.



Pen Commands

When you click on the tab for the pen you will see the following tools:



PU – Pen Up – picks up the pen so that it does not draw.



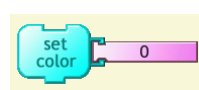
PD – Pen Down – puts the pen down so that it can draw.



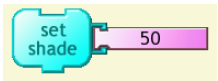
Set pensize – sets the width of the pen. The larger the number the fatter the line.



Set color – sets the color of the line that will be drawn. The value can be 0 to 99. See the table below for colors.



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.



Fill screen – this will fill the entire screen with the color and shade shown.



pensize
color
shade

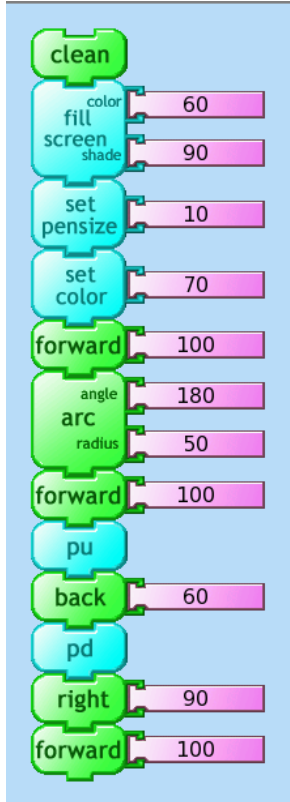
These will give you the current value for each item.

The turtle pen colors are:

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

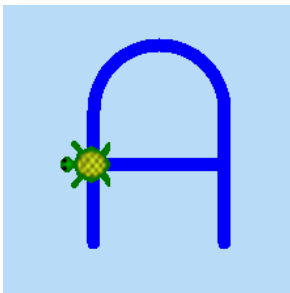
Try it out!

What will the following set of commands create?



- I start with a clean so it will clear the screen before it draws the shape again.
- The fill screen command will fill the screen with a light blue color. You can click on the color value (60) and type a new color (0 – 99). You can click on the shade value (80) to change the shade (0 – 99 where 0 is very dark and 99 is very light)
- The set pensize command will make the line fairly thick. Click on the size (10) and type a new value. The larger the number the thicker the line. The only limit is the size of your screen.
- The set color command changes the color of the line. Click on the color value (70) and type a new value (0-99).
- The forward command will move the turtle forward the number of spaces specified. Click on the value (100) to change it.
- The arc command will create part of a circle. In this example 180 angle will create a half a circle. The radius is the size of the circle.
- The pu (pen up) command will pick up the pen so it will not draw a line for any of the commands that follow until there is a pd (pen down) command.
- The back command will move the turtle back the number of spaces specified. Click on the number to change the value.
- The pd (pen down) command will put the pen down so it will draw.
- The right command turns the turtle to the right the angle specified. This is the turtle's right, not your right. Click on the angle value (90) to change it.
- The forward command will move the turtle forward the number of spaces specified.

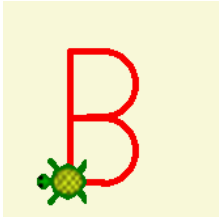
Did you get this shape?



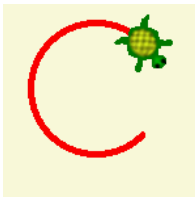
Click on the turtle and drag it to a new location if you want to see the entire shape.

Try it on your own!

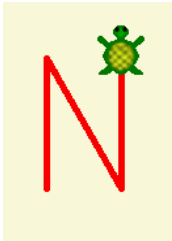
Can you create the letter B as shown?



Can you create the letter C as shown?

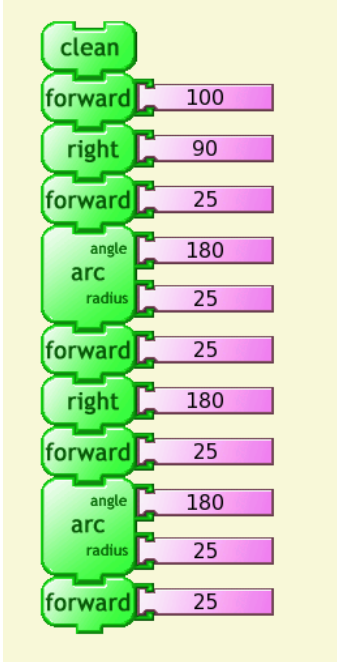


Can you create the letter N as shown?

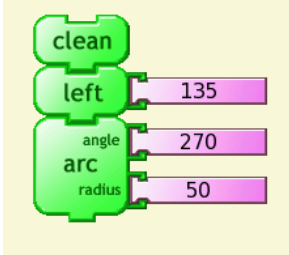


Can you write your name?

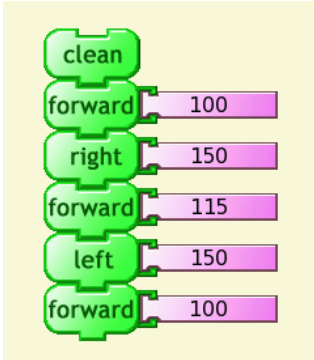
Here's how I created the letter B.



Here's how I created the letter C.



Here's how I created the letter N.



Here's my name:

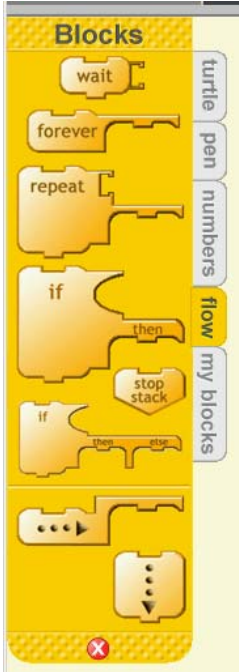
The screenshot shows the Turtle Art activity window. The interface includes a top bar with 'TurtleArt Activity' and 'Share with: Private'. Below this are tabs for 'Activity' and 'Project'. A 'Blocks' palette on the left contains various drawing blocks like 'clean', 'pu', 'forward', 'pd', 'right', 'left', 'arc', and 'right'. The main workspace contains a sequence of blocks that have been used to draw the name 'JENNY' in red. The blocks are arranged in five columns:

- Column 1:** clean, pu, forward (100), pd, right (180), forward (75), arc (angle: 180, radius: 25), pu, forward (75), right (90), forward (75).
- Column 2:** pd, forward (50), back (50), right (90), forward (50), left (90), forward (50), back (50), right (90), forward (50), left (90), forward (50), pu, forward (25), left (90).
- Column 3:** pd, forward (100), right (150), forward (115), left (150), forward (100), pu, right (90), forward (25), right (90), forward (100), right (180).
- Column 4:** pd, forward (100), right (150), forward (115), left (150), forward (100), pu, right (90), forward (25).
- Column 5:** pd, right (45), forward (50), left (90), forward (50), back (50), right (135), forward (65).

The name 'JENNY' is drawn in red on the workspace. A small green turtle icon is positioned at the end of the letter 'Y', and a mouse cursor is pointing at it.

Repeating Commands

Sometimes you want to repeat a set of commands over and over to create a pattern.

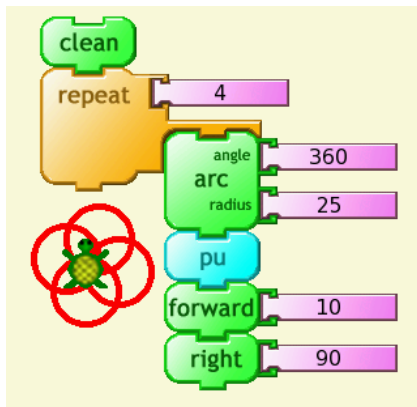


We will work with one of the flow commands, repeat.



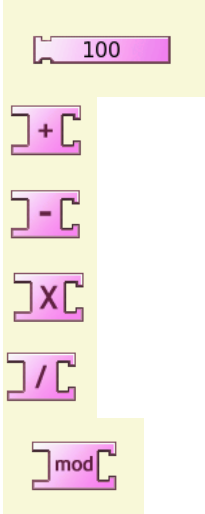
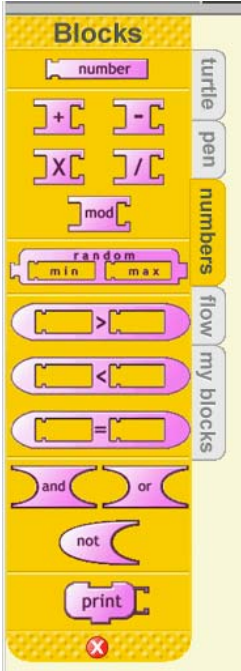
Any commands that are attached to the repeat will be repeated the number of times specified by the number on the top.

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



Numbers

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



Number – specify the number you want to use in the operation.

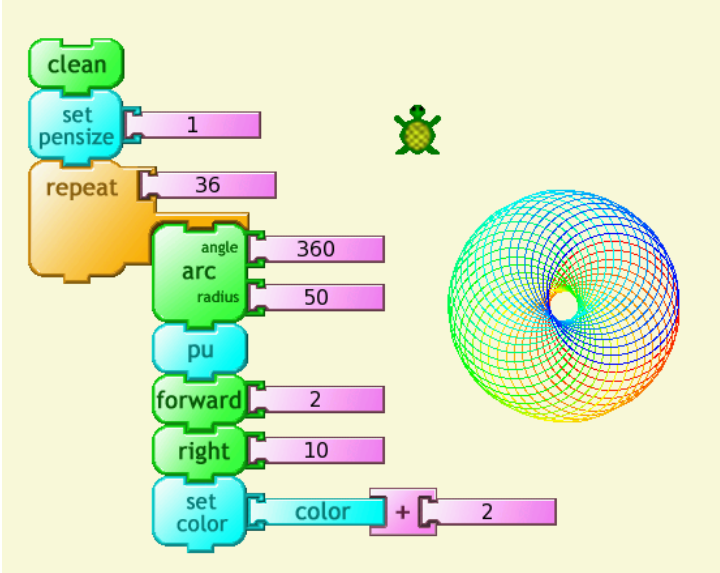
+ - performs addition – $5 + 3 = 8$

- - performs subtraction – $5 - 3 = 2$

X – performs multiplication - $5 \times 3 = 15$

/ - performs division – $5 / 3 = 1.67$

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

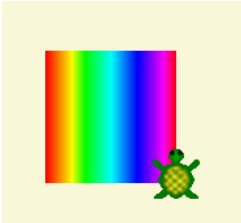


This is similar to the example for the repeat, but in this case we are changing the color each time it repeats. We take the current value of color (which is 0 the first time through) and add 2 to it, giving us 2 for the color on the second loop, 4 for the third and so on.

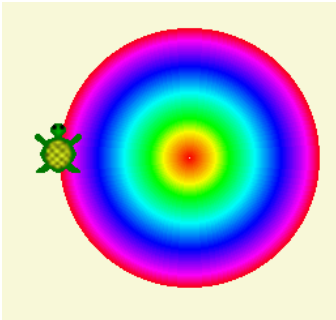
One note on the color: If I increase the color value by 5 each time then when it gets to 99 it starts over again at 0.

Try it out!

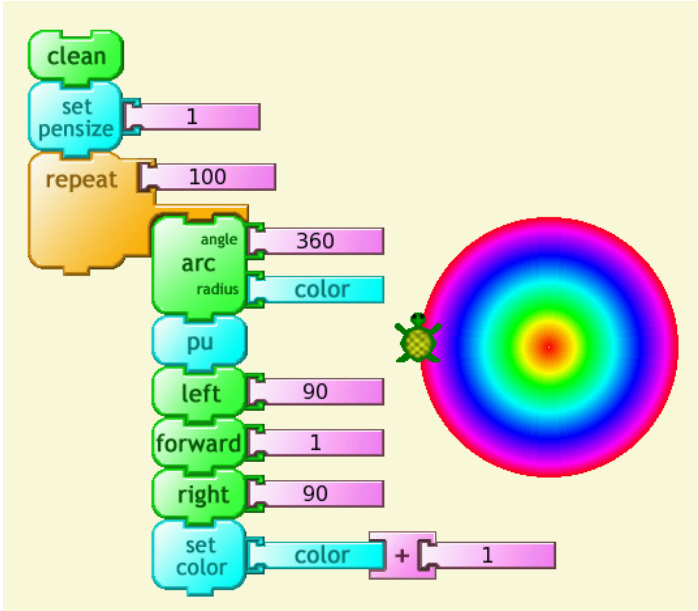
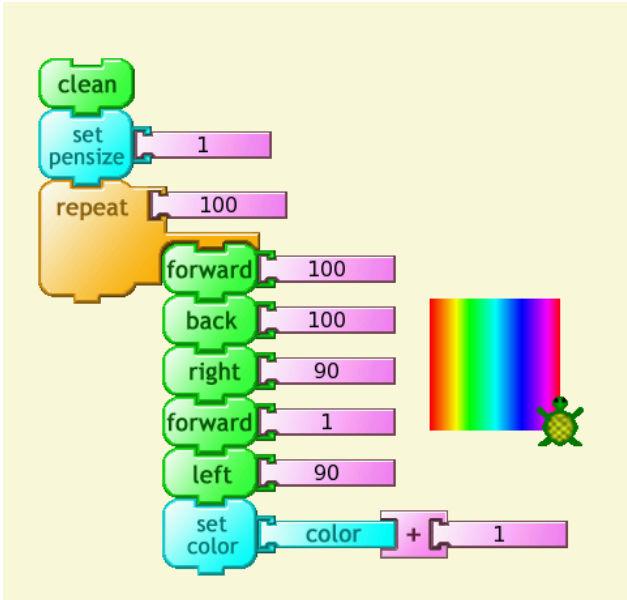
Can you create this?



Can you create this?



My Solutions



Since color is a number I can use that to set the radius of the circle