

Creating a T-Shaped Puzzle with CNC – Scratch Worksheet

Part A: Creating the Puzzle Pieces



Go to the Scratch website at:

<https://scratch.mit.edu/projects/237145228/#editor>

1. This link will bring you to an already completed code. Click the green flag to see what happens.



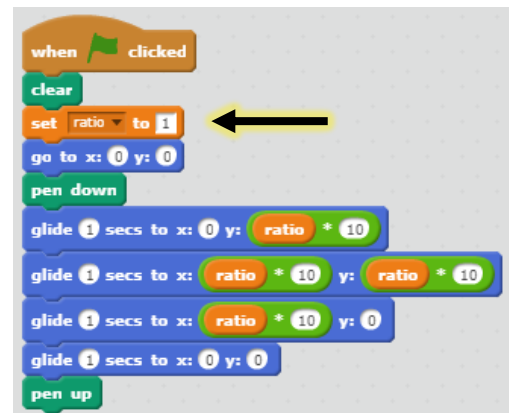
What happened when the green flag was clicked?

In writing or to a friend, describe what the sprite did. What does each line / block mean?

Using the blocks in the coding section, change the code so it looks like:

Try clicking the green flag again. What happens?

Explore the ratio variable by changing the number.
What does this do?



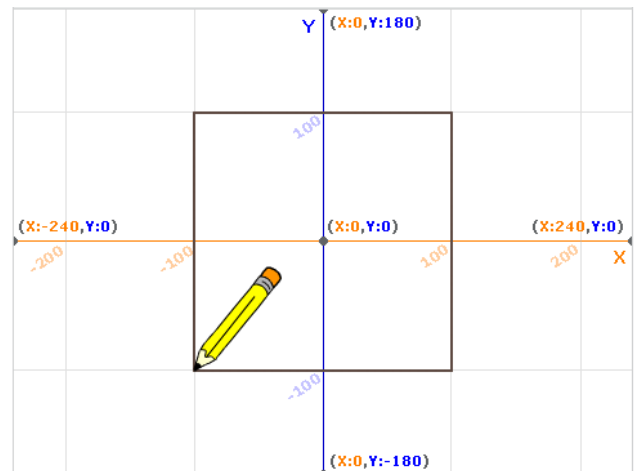
Look at the bottom right of the Sprite screen, there are two numbers. Watch what happens as you move your mouse around the screen.

What do you notice? What do the numbers represent? How are they related to the code from the previous steps?

If you have trouble answering the questions above, try clicking the up-arrow on your keyboard!

Now that you understand the ratio and code for drawing, explore other changes you can make. *(Click the down-arrow to switch to a plain backdrop)*

Can you draw the square like this?



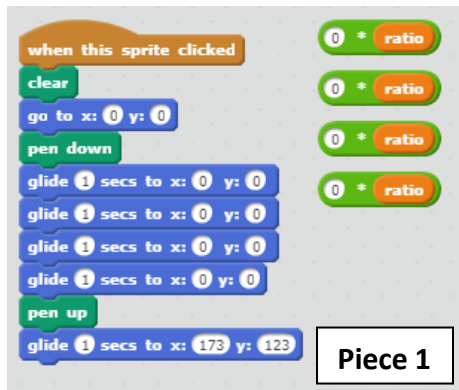
Compare the Scratch code to the G-code.

How are they similar? (List at least two ways)

- 1.
- 2.

2. In a new coding interface, you will be modifying code similar to part one to simulate the movements that the CNC machine will make to create the T-shaped puzzle pieces. By creating the Scratch code, you will be checking if the CNC code you created in class is correct.

Go to: <https://scratch.mit.edu/projects/237146036/#editor>



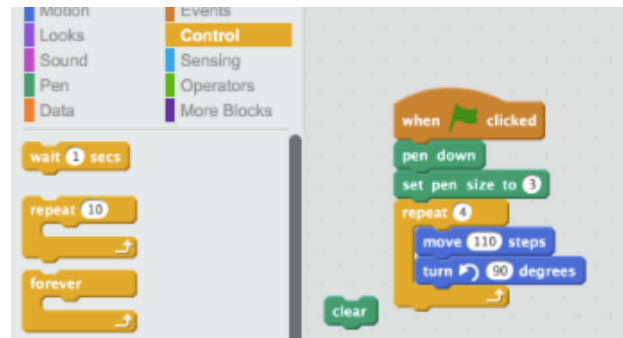
Use the measurements you found on the puzzle piece handout to determine the coordinates for the laser to draw. (Use 4 decimal places)

All the pieces are there for you. You do not have to create any new code.

Part B: Drawing Shapes in Scratch!

1. **Walk a Square.** Write this code in Scratch by dragging the commands into the right-hand side of the screen. Press the green flag to draw the square. Compare this code to the code we used to draw the square in Part A.

What is different about the two codes?
What is the same?



2. **Walk an Equilateral Triangle.** Modify the code from part one to draw an equilateral triangle. (Hint: think about the unique properties of an equilateral triangle)
3. **Walk a Circle.** Challenge yourself! Modify the code from parts one and two to draw a circle.