



CODING WITH MINECRAFT

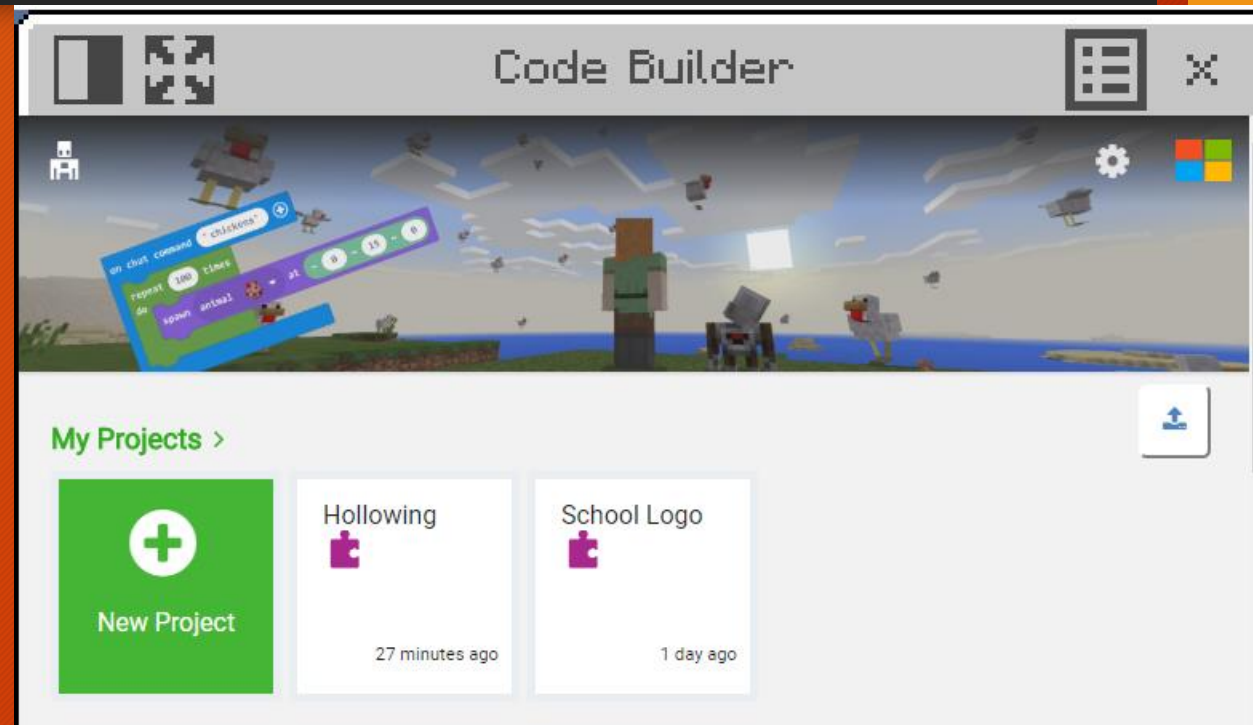
Who built the Pyramids?

Section 1

- Starting

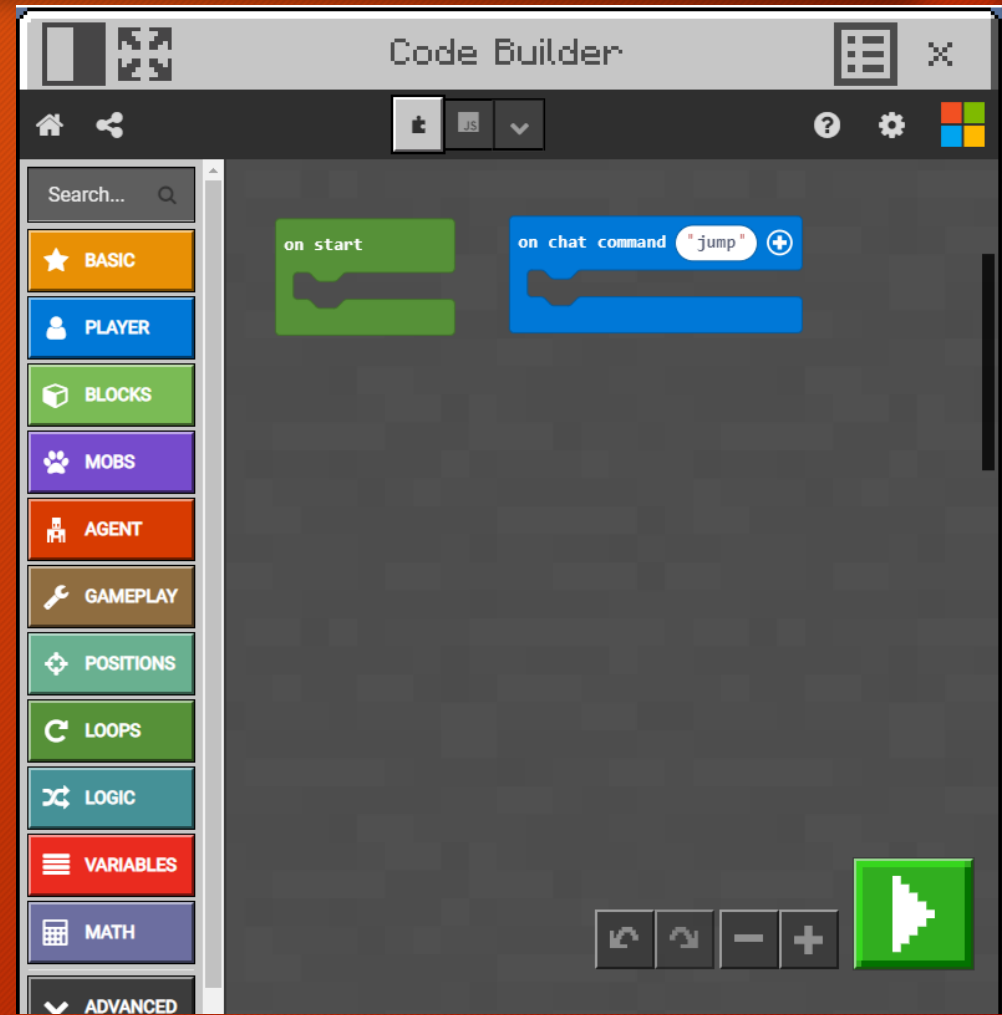
Setting up the Code

Load into Minecraft and sign in. Once you have opened a world, press C, or click on the robot face if on tablet, and you are sent to the Code Builder. If first time, you will have a choice of Makecode, Python or Tynker. Use Makecode for now. Select New Project and name the project as whatever you wish. If you don't finish the project straight away and need to come back, you must always re-enter the Code Builder and find this code.



Setting up the Code

This is your coding screen. It works the same as Scratch. There will be a lot of code, and we will go through each step.

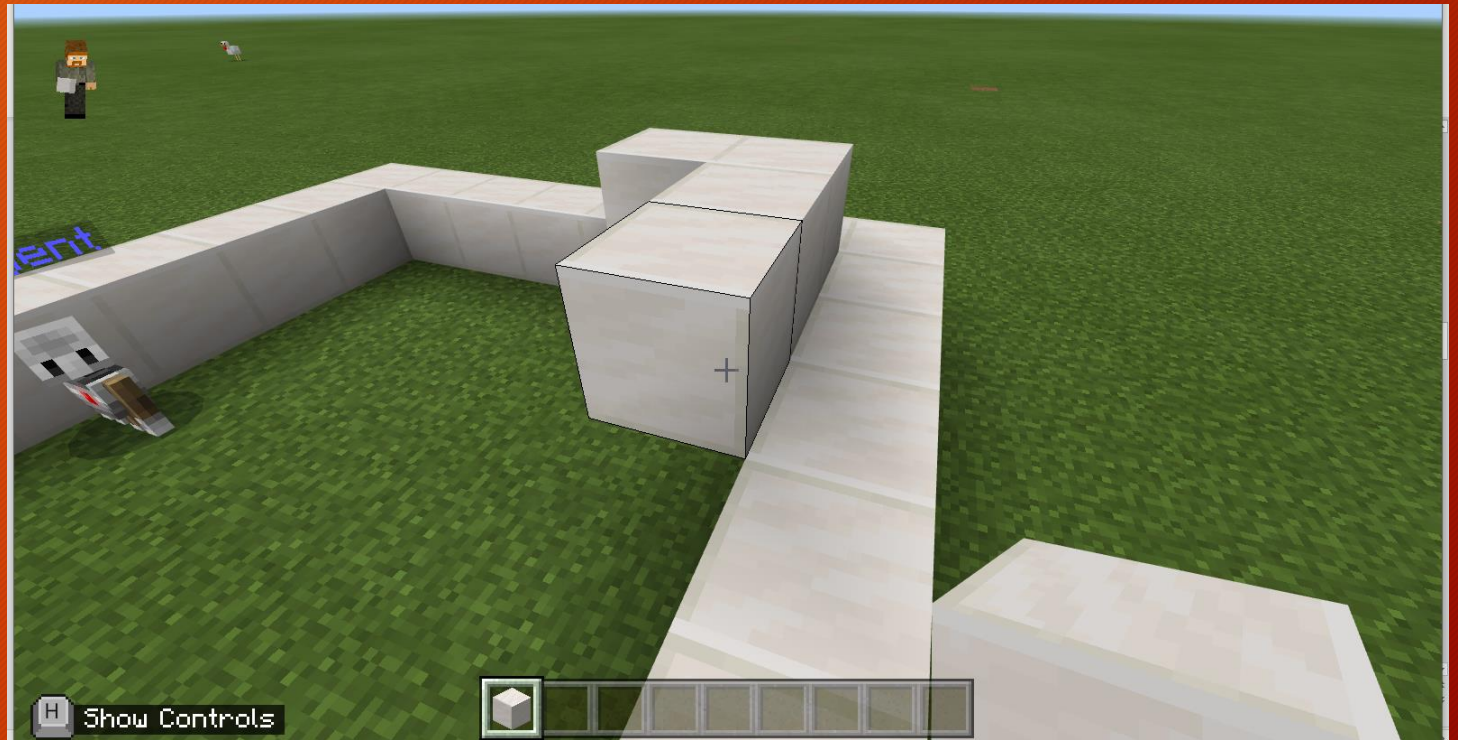


Section 2

- Who built the Pyramids?

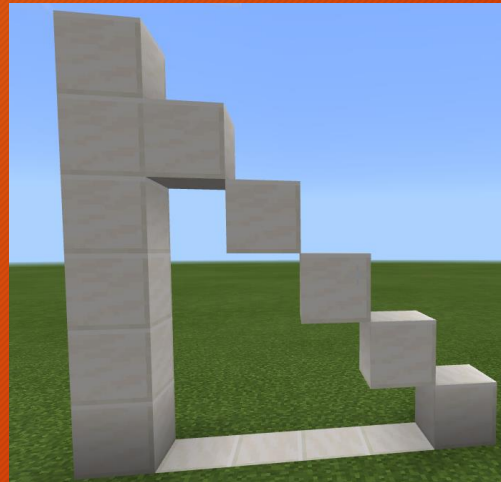
Pyramid Basics

When building a pyramid the normal way, you would arrange a square of blocks, and then a size smaller square on top until you reach the end. This can be really slow and boring work.



Pyramid Basics 2

There are two things to remember to make it faster. First, the height of the pyramid will be the same as the length from the middle to the side at the base. Also, in Minecraft, everything is measured as x, y, z. (x being West to East, y being up and down, z being north and south.)



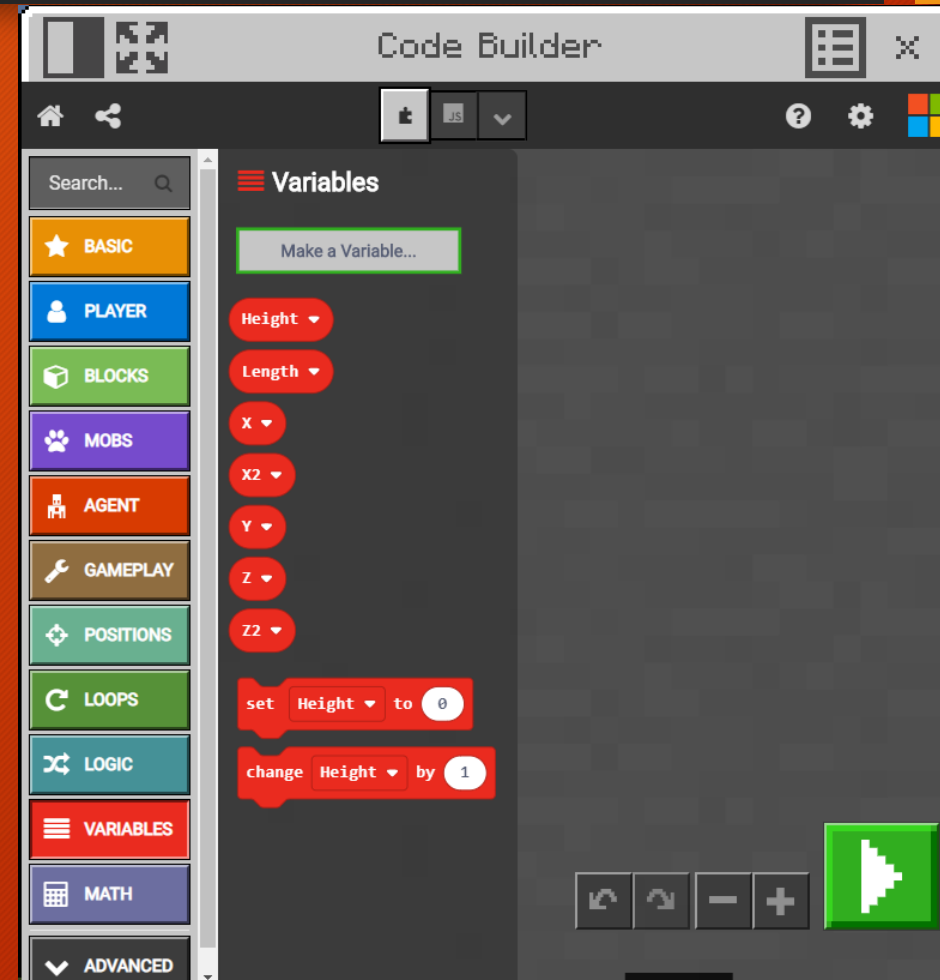
Section 3

- Code 1

Code 1

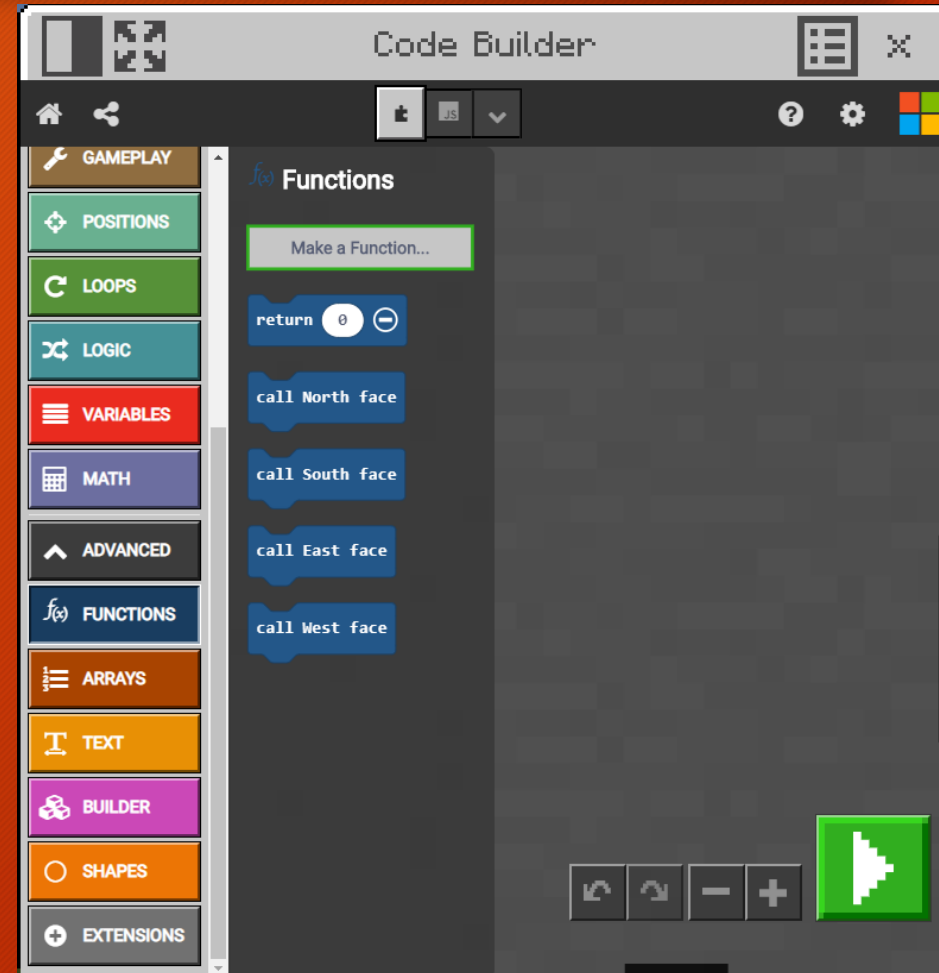
The first code we can try is very simple using functions. First create a series of variables by clicking on the red variables tabs. You will need the following:

- X
- X2
- Y
- Z
- Z2
- Length
- Height



Code 1 continued

Next click on Advanced at the bottom and select Function. Each Function will be a face of the pyramid.



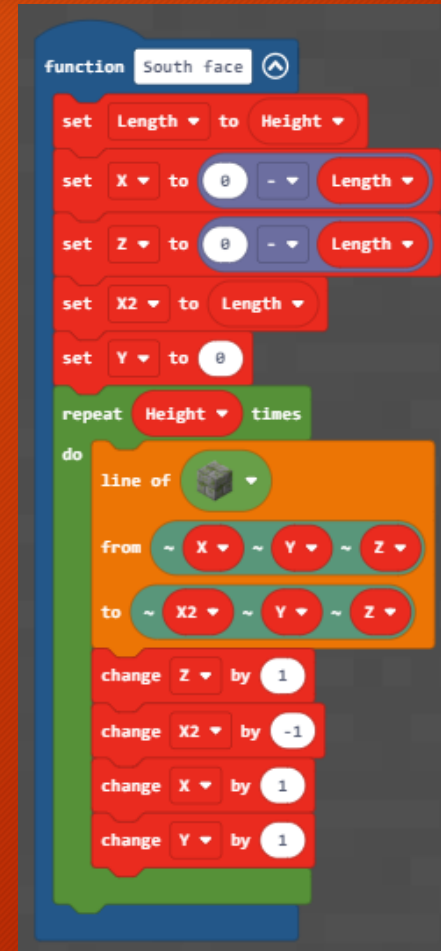
Code 1 North Face

Here is the Coding for North Face. Remember, the length of the base is double the height plus 1. X2 will be a negative value, so is west of your location, and X is positive so to your East. Z will move closer to you each time Y gets higher. As You move up the height, the length gets smaller.



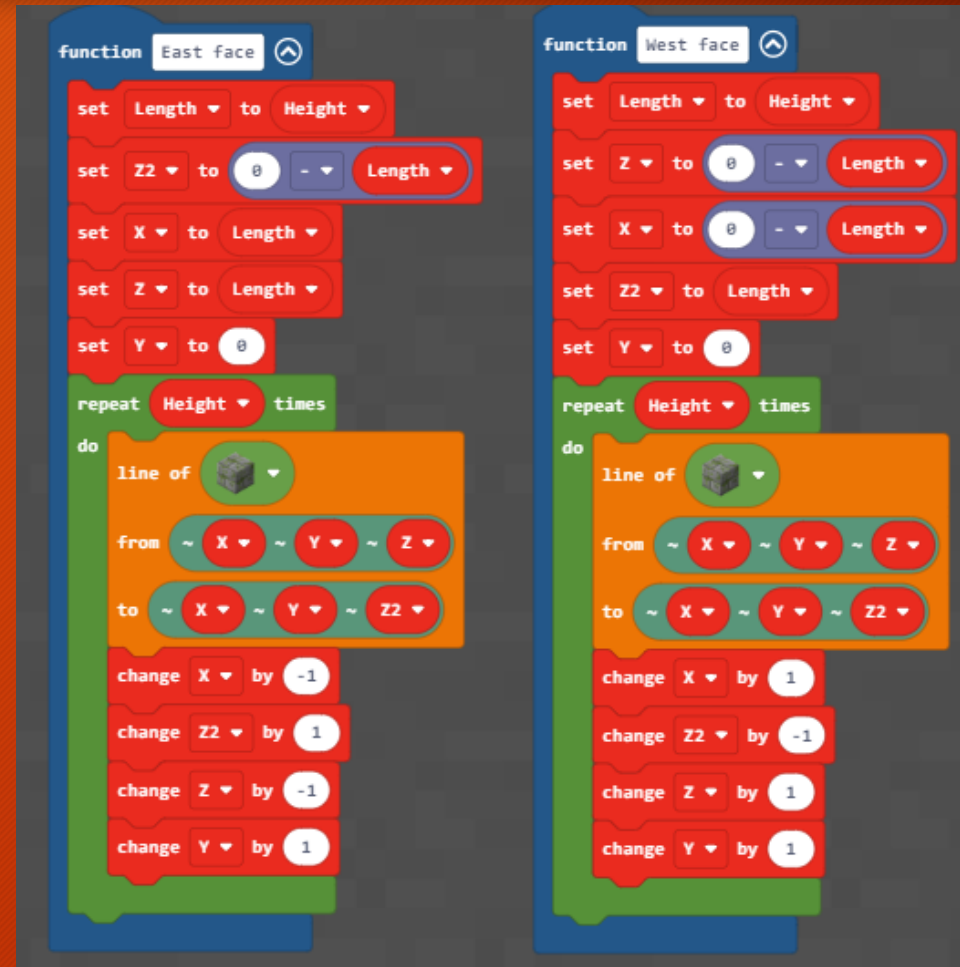
Code 1 South Face

The Coding for South Face is the same but with some alterations. Can you spot them?



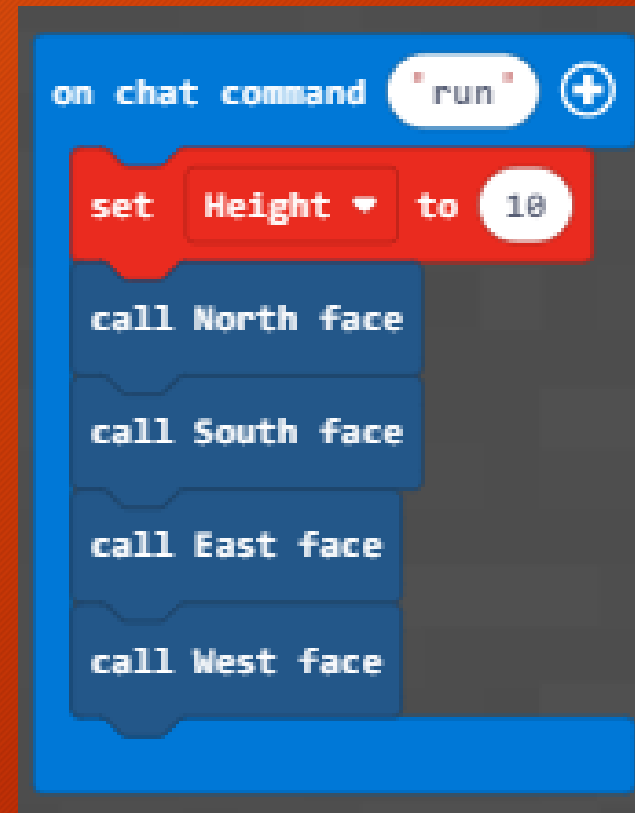
Code 1 East and West Face

The Coding for East and West works the same, but this time the X values moves closer to you with the height and the Z value gets smaller.



Code 1 Putting it Together.

Once all faces are done, put the functions into a code like this. Each time you do this, set the height to whatever you want, but remember, the higher it is the longer it will take. You can also use whatever code command you want.



Code 1 Building the Pyramid.

Go back to your world by clicking the exit symbol on Makecode. Click T on keyboard, or select speech bubble on tablet. Type in your command, press enter and watch the pyramid build. Important, do not move until it is finished. The top will always be left open.



Code 1 Finished

Fly out by pressing
Space/jump twice and
see your pyramid.



Section 4

- Code 2

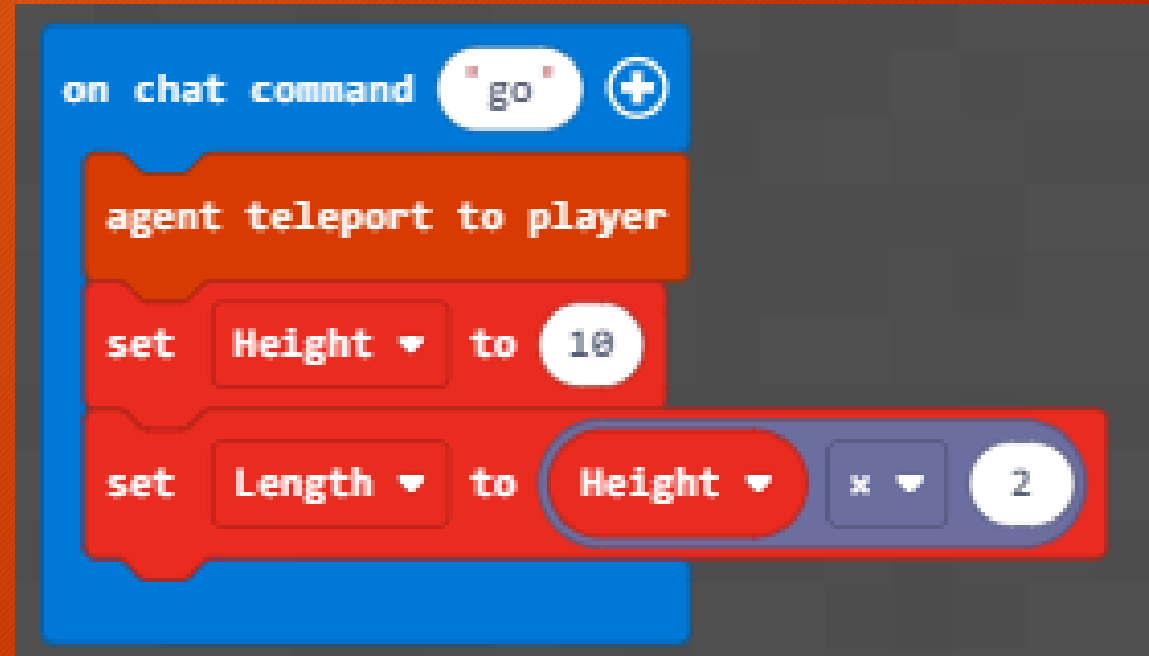
Code 2

Code 1 is good and easy, but you are limited to how you set the walls. In addition, you cannot move. We are going to do a code now with our friendly helper, the agent.



Code 2 Continued

Start Code 2 like this.
This sets the sizes.
Remember the length of the bas is twice the height add 1. the extra 1 comes in later. The top command is for the Agent to come to you wherever you want your pyramid to be.



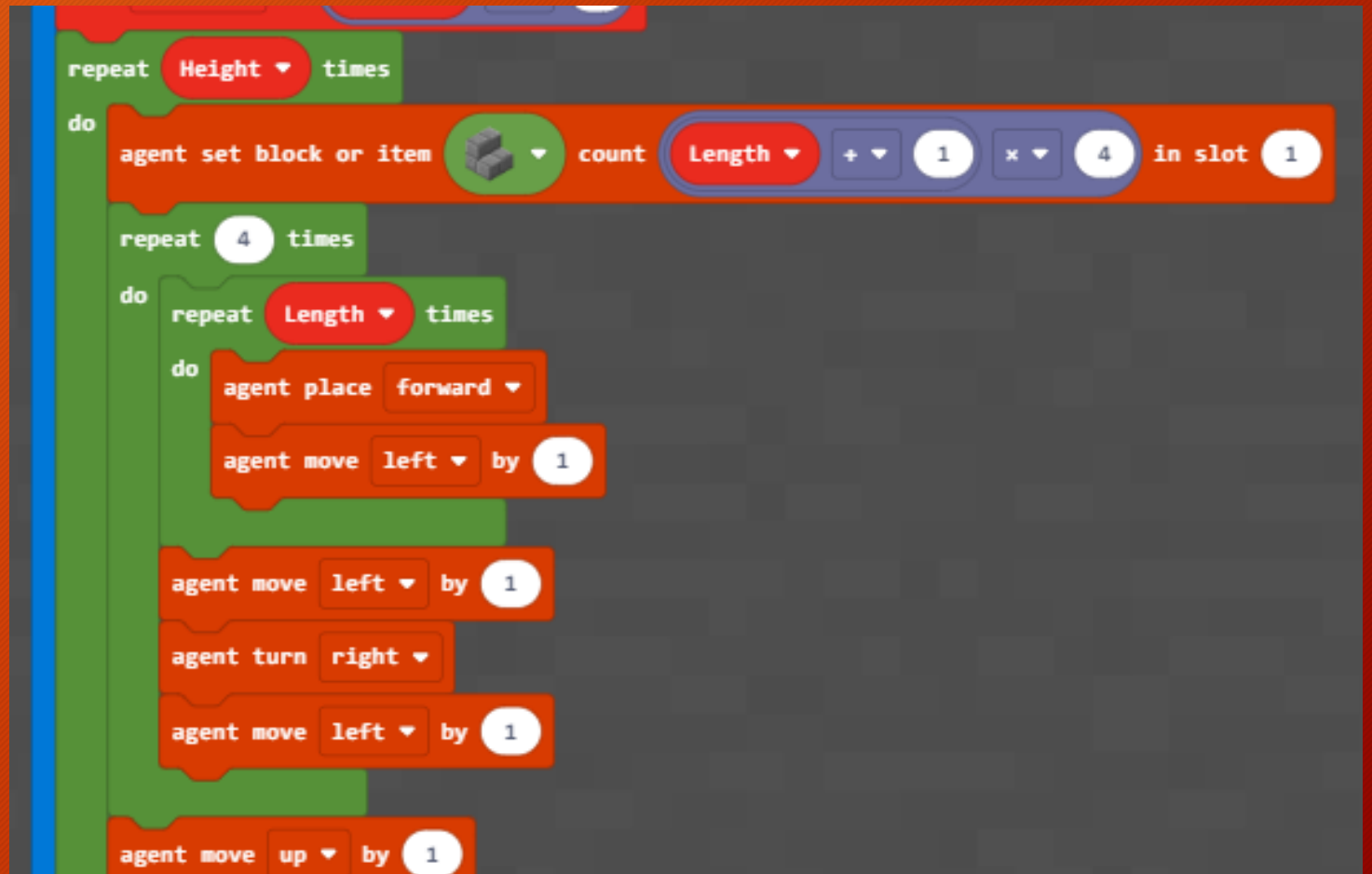
Code 2 Continued

Add the section in the green loop underneath within the blue box. This sets the height and how the Agent moves up and alters the size.



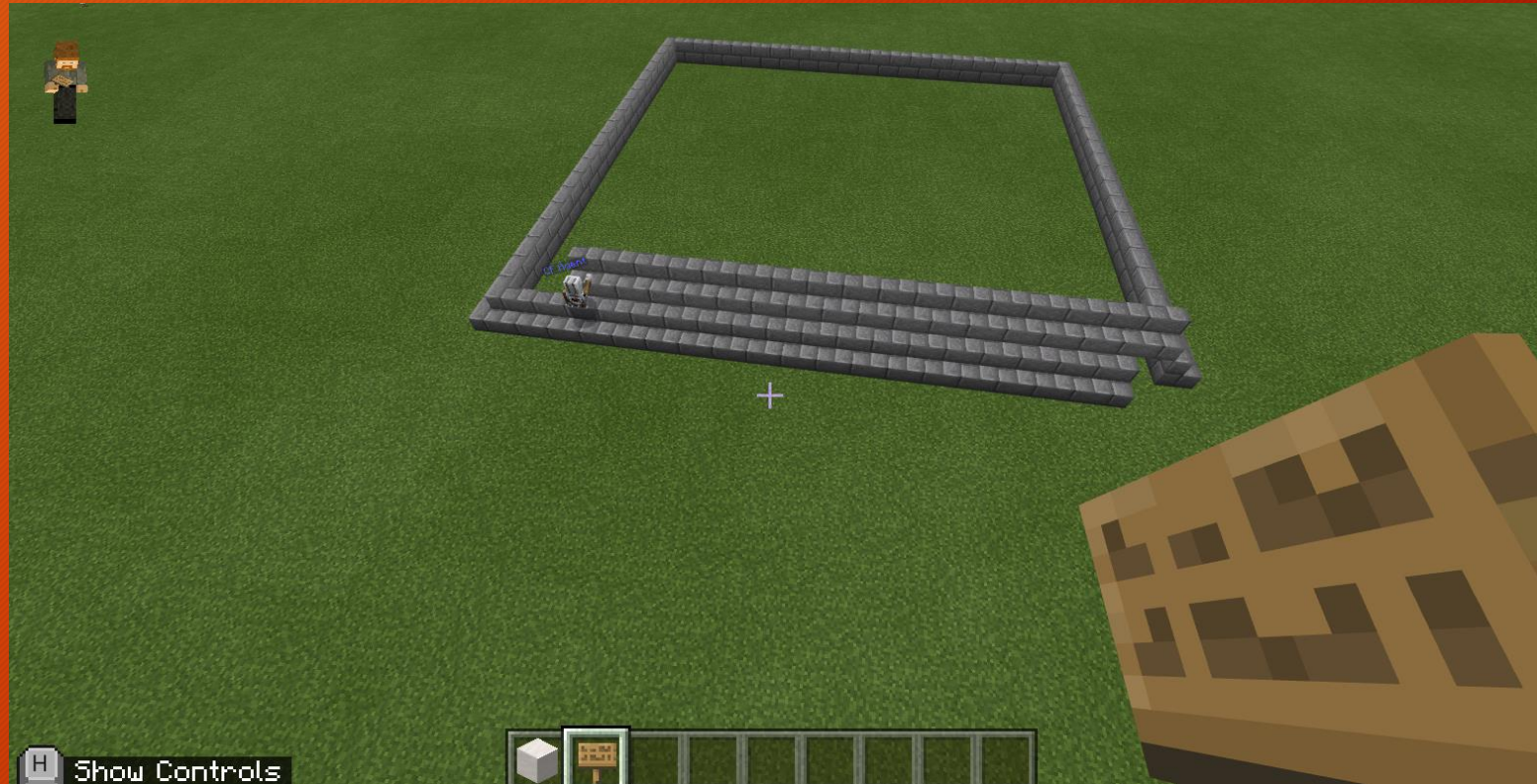
Code 2 Continued

This is the main bit. You place it at the top of the green Repeat Height times loop before the Agent move up command. This code creates the wall. Through this coding, you can also use step blocks, which create a steeper look.



Code 2 Building the Pyramid.

Go back to your world by clicking the exit symbol on Makecode. Click T on keyboard, or select speech bubble on tablet. Type in your command, press enter and watch the pyramid build. Important, do not go too far. If you make the pyramid too big, the further the agent is away from you there is a chance the code is broken. Stay close to your agent. The top will always be left open.



Code 2 Obstacles

You may have noticed a gap in my picture on the last page. This happens because a mob may get in the way of the agent, or you do. Not a problem, just fill it in yourself. However, this image in on Blocks of Grass template, which is all flat. If on another biome with walls or hills, alter your code like this. (NB if sand or gravel is above the block you destroy, it will fall in the way and block your Agent. Clear as much of it by yourself if you can.)



Code 2 Glamming it up

Alter your code like this. It will give your corners a different look.

Original Code

```
repeat Height times
do
  agent set block or item [stone] count (Length + 1 * 4) in slot 1
  repeat 4 times
  do
    repeat Length times
    do
      agent destroy forward
      agent place forward
      agent destroy left
      agent move left by 1
    end
    agent move left by 1
    agent turn right
    agent move left by 1
  end
end
```

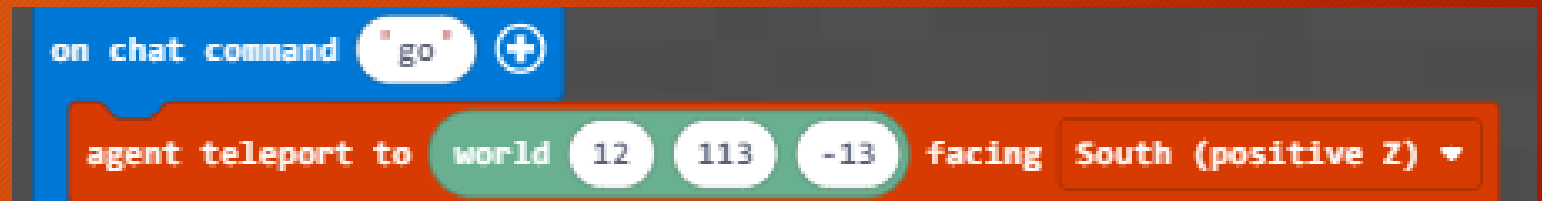
Altered Code

```
repeat Height times
do
  agent set block or item [stone] count (Length * 4) in slot 1
  agent set block or item [brick] count 4 in slot 2
  repeat 4 times
  do
    agent set active slot 2
    agent destroy forward
    agent place forward
    agent destroy left
    agent move left by 1
  end
  repeat (Length - 1) times
  do
    agent set active slot 1
    agent destroy forward
    agent place forward
    agent destroy left
    agent move left by 1
  end
  agent move left by 1
  agent turn right
  agent move left by 1
end
```



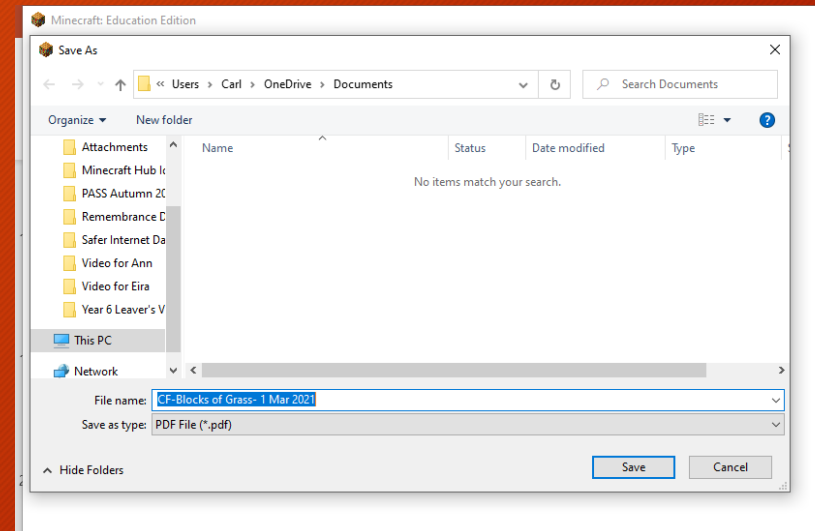
Placing your Agent

Sometimes where your Agent appears can be troubling. Also, remember he starts in a corner and moves clockwise. Instead of having the Agent teleport to you, you can be very precise of where he goes using this code at the beginning.



Show your evidence

Remember to equip your camera and portfolio. Take pictures of your work, and then give a caption in your portfolio. Click Export Portfolio and it saves on your computer as a PDF document. This you can then email to your teacher.



Challenge

- Alter the sizes and materials.
- Can you alter the code to make different styles of pyramid?
- Can you create an extra bit of coding to place a block at the very top?

Enjoy Coding

