

Microsoft MakeCode for

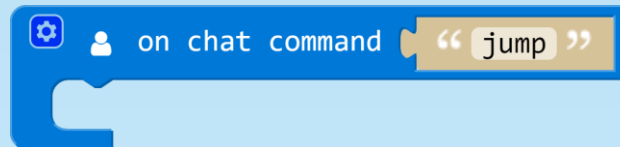


Lesson Title: Agent

Introduction/Background: In Minecraft: Education Edition, the Agent is your own personal Robot! You can create programs to make him move, build or dig for you in the game.

Lesson Steps: In this lesson, we will create basic commands we can use for our Agent.

To do this, we will use a special event in Microsoft MakeCode called the **"On Chat Command"** which is a useful way to teach students about functions.

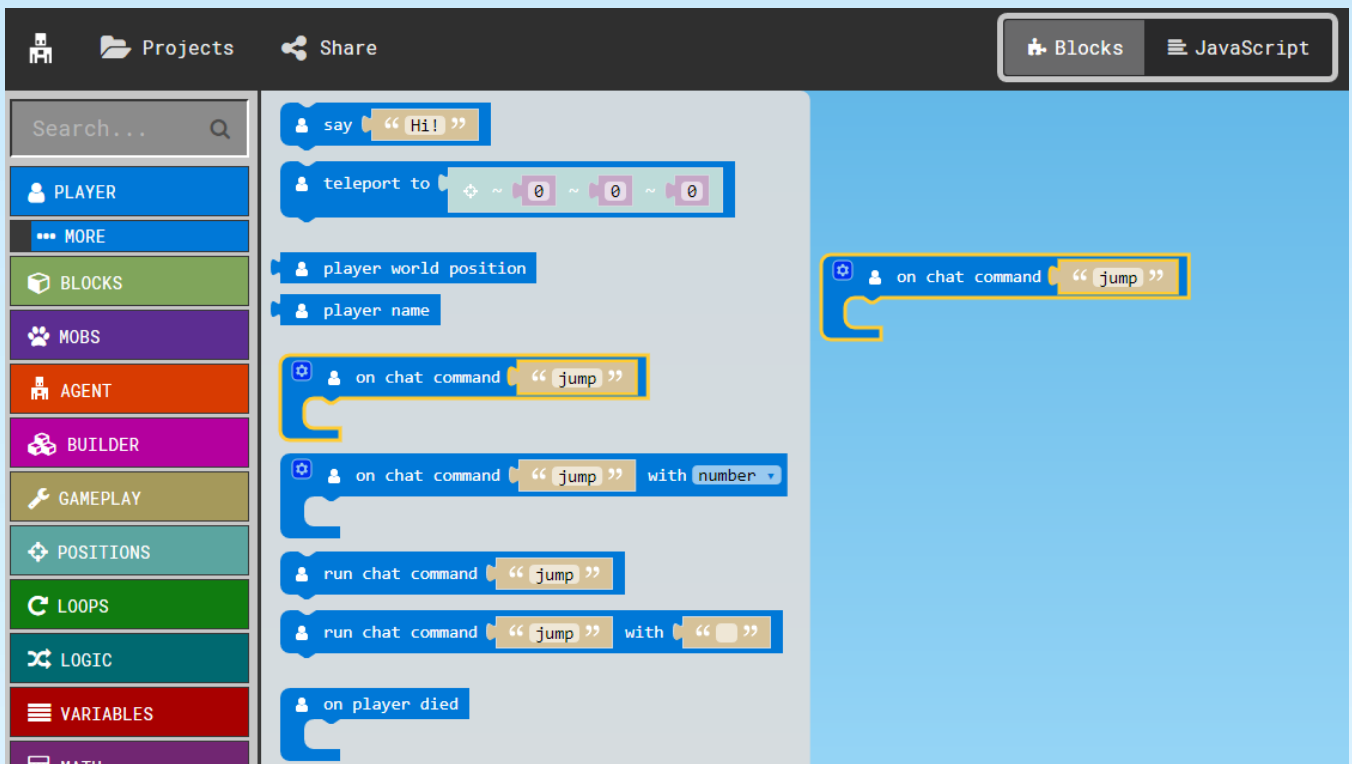


In computer science, a "function" is a way to group commands together. For example, the function of Waving might group the following commands together:

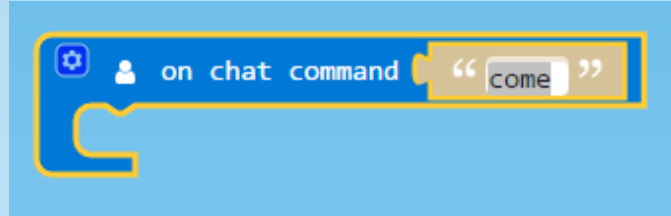
- Raise hand
- Move hand left
- Move hand right

In this case, we will be creating some **On Chat Commands** that will tell our Agent what to do. Students can type the name of their functions into the Minecraft game to execute that function.

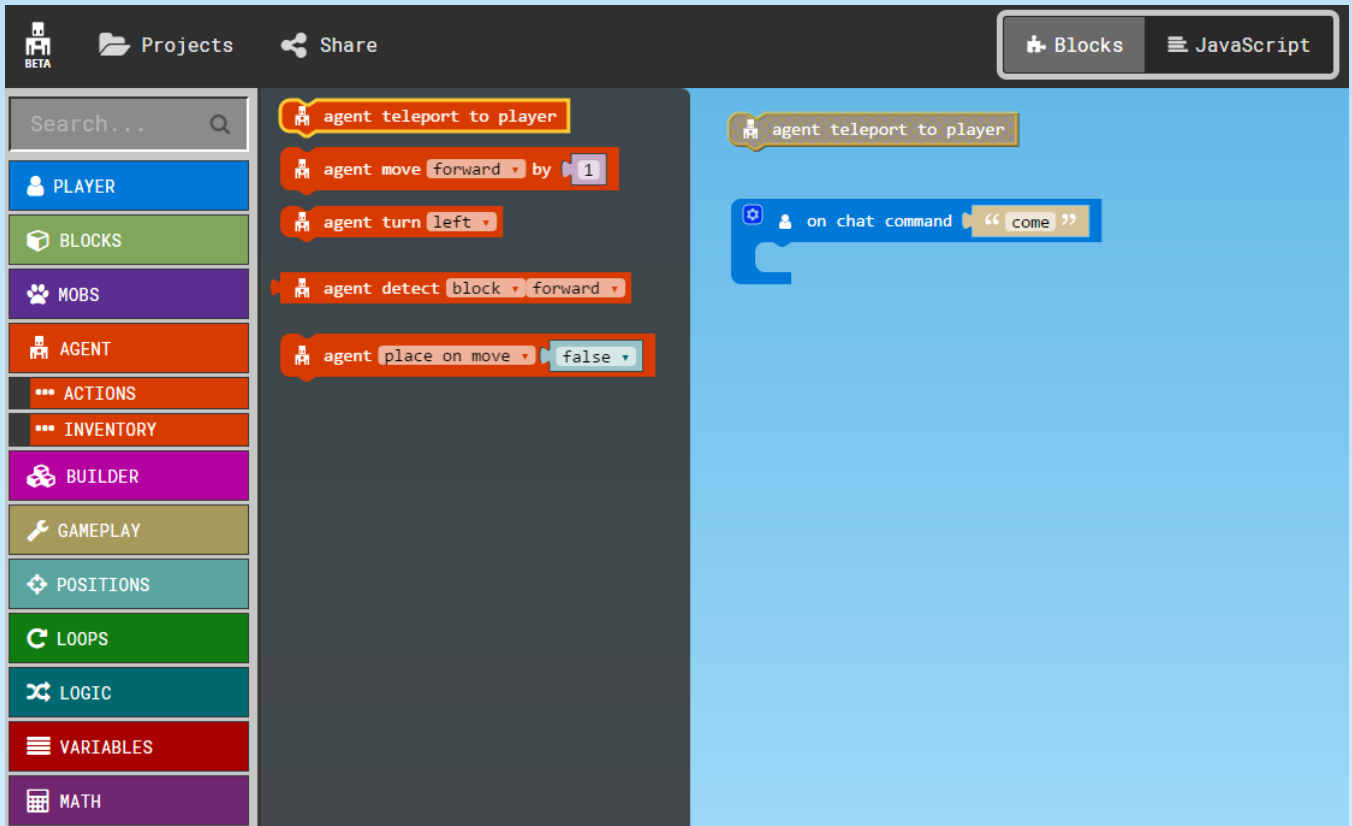
Step 1 – From the **Player** Toolbox drawer, drag and drop the **On Chat Command** block onto the coding Workspace.



Step 2 – The first command we will create is to teleport our Agent to our Player. Rename this **On Chat Command** to “come”

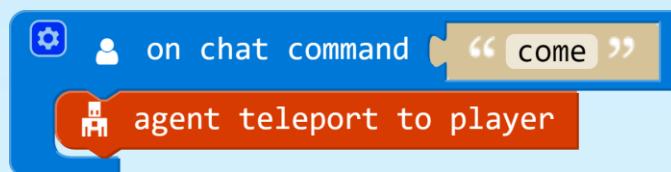


Step 3 – From the **Agent** Toolbox drawer, drag and drop the **Agent Teleport to Player** block onto the coding Workspace.



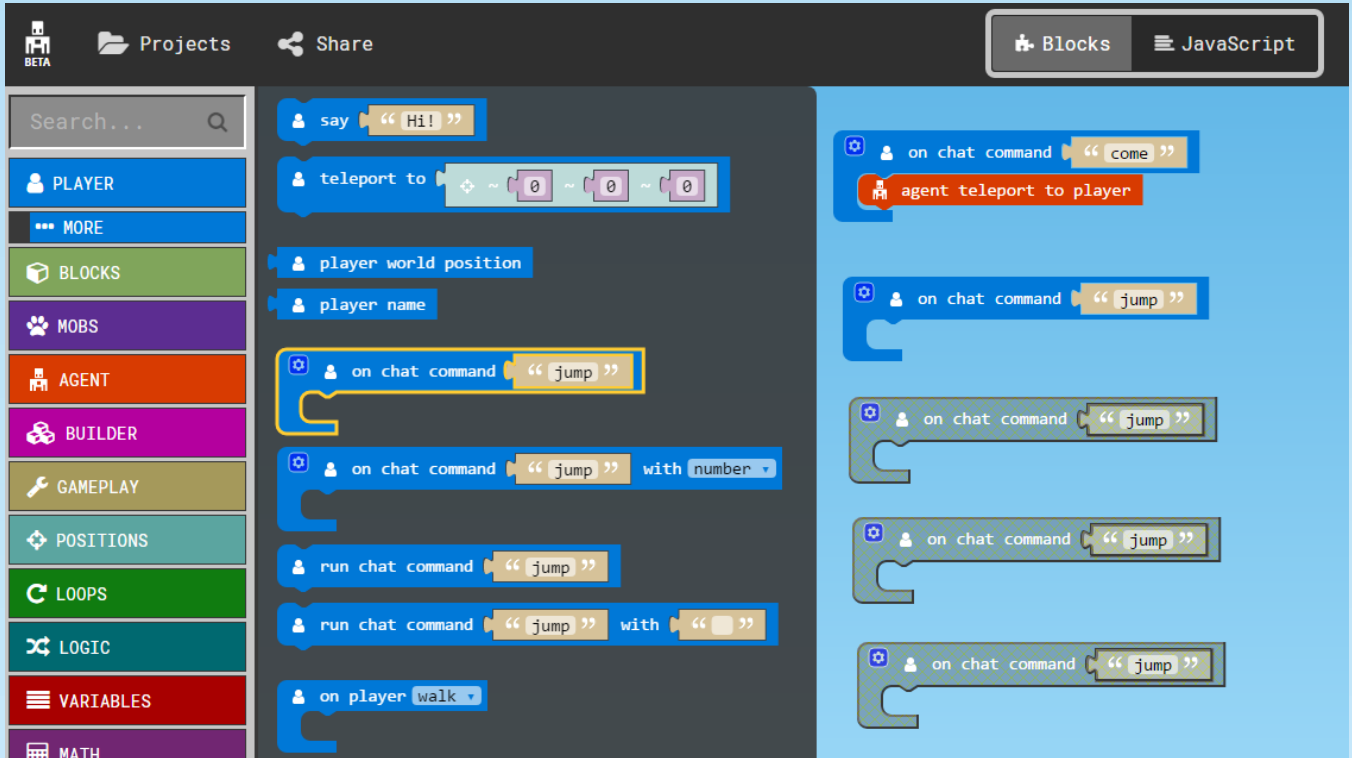
Notice that when you place the block onto the coding Workspace, it becomes disabled (turns grey with hashmarks). This means this block won't run in your current program. That is because it is not associated with an event.

Step 4 – Drag the **Agent Teleport to Player** block under the **On Chat Command** event



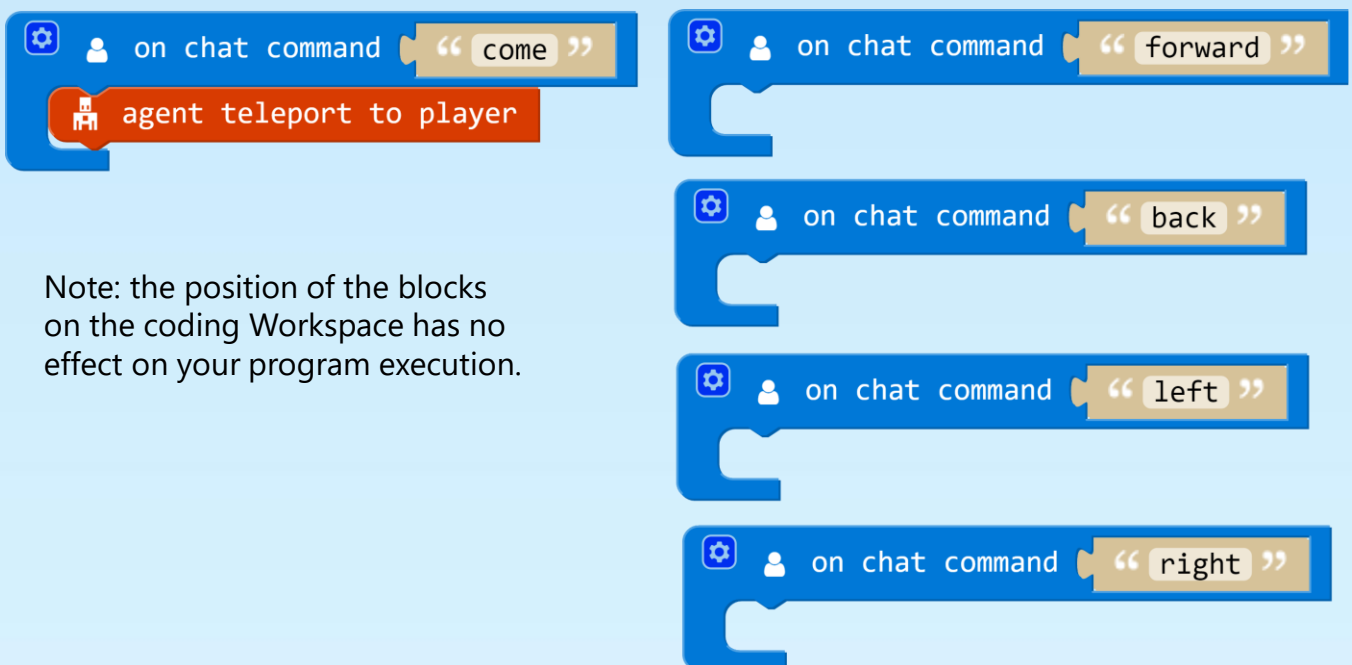
Step 5 – In your Minecraft game, press 't' to open the chat screen. Type “come” and press Enter. Step back, you should see your Agent right next to you!

Step 6 – Now, let's add some commands to make your Agent move around. From the **Player** Toolbox drawer, drag and drop 4 of the **On Chat Command** blocks onto the coding Workspace.



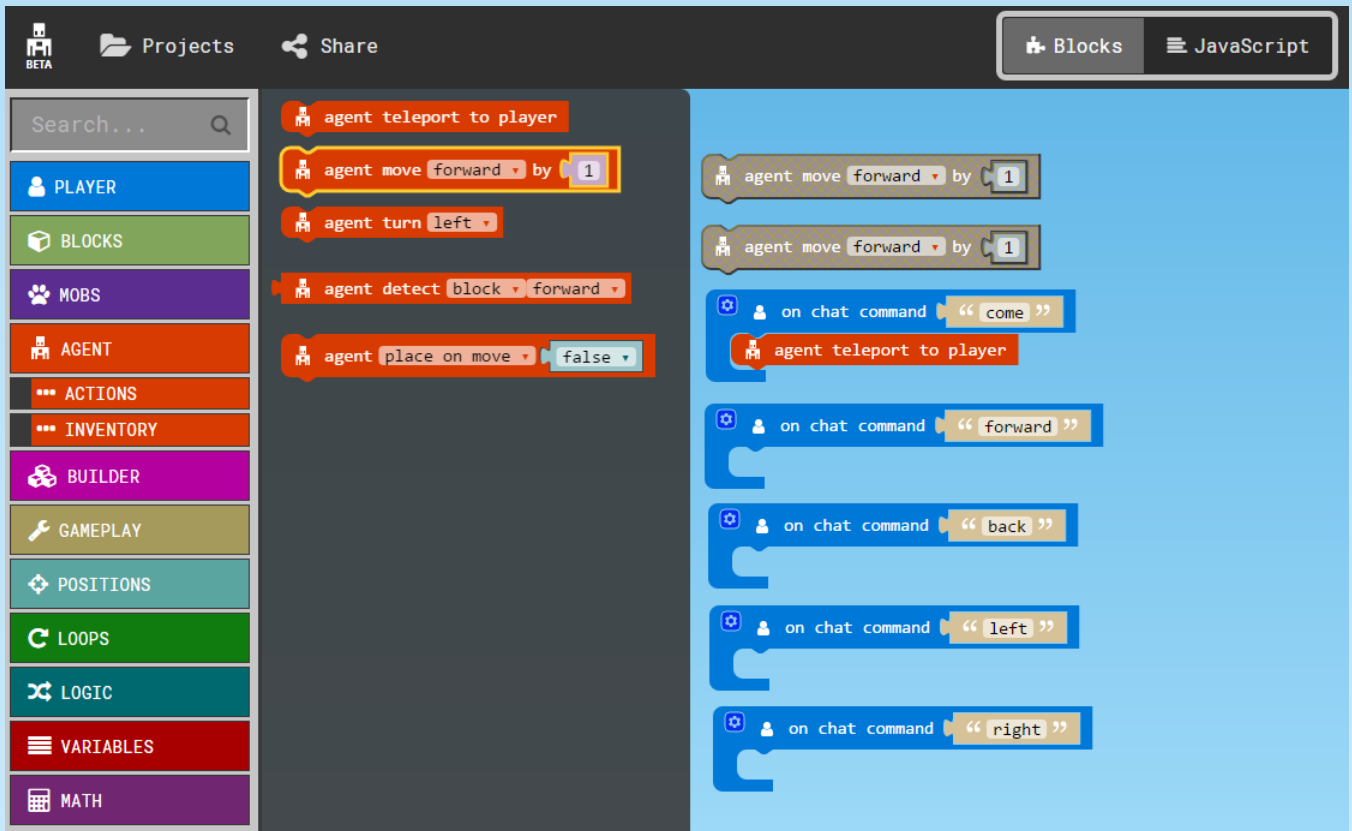
Note: You can also right-click on any block and select Duplicate to copy it.

Step 7 – Rename the 4 **On Chat Command** blocks to: "forward", "back", "left", and "right"

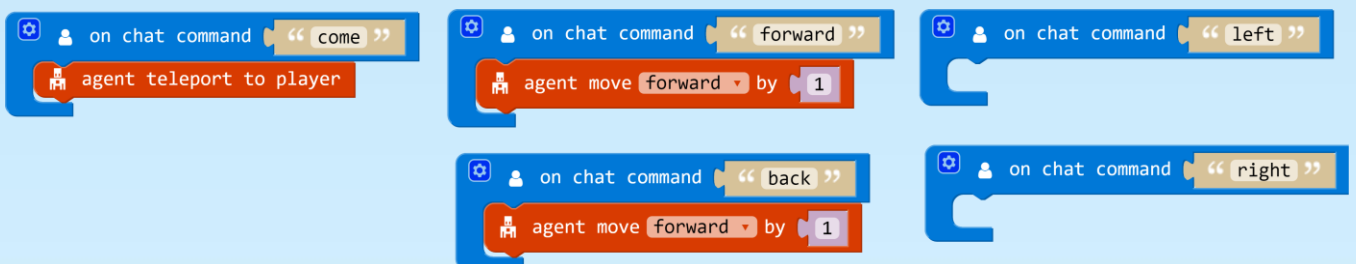


Note: the position of the blocks on the coding Workspace has no effect on your program execution.

Step 8 – From the **Agent** Toolbox drawer, drag and drop 2 of the **Agent Move** blocks onto the coding Workspace



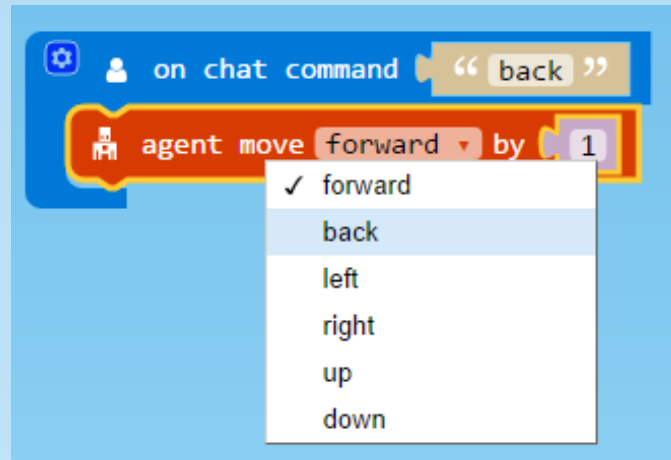
Step 9 – Drag 1 of the **Agent Move** blocks under the **On Chat Command “Forward”** block, and drag the other one under the **On Chat Command “Back”** block.



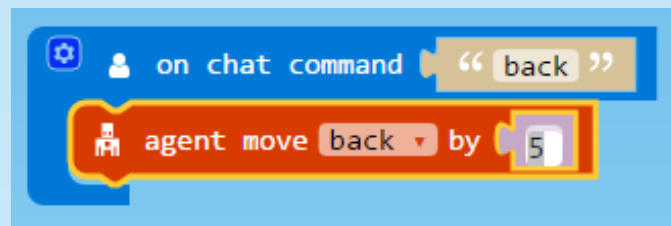
Step 10 – Under the **On Chat Command “Forward”** block, change the number of blocks the agent will move forward by to **5** in the **Agent Move** block.



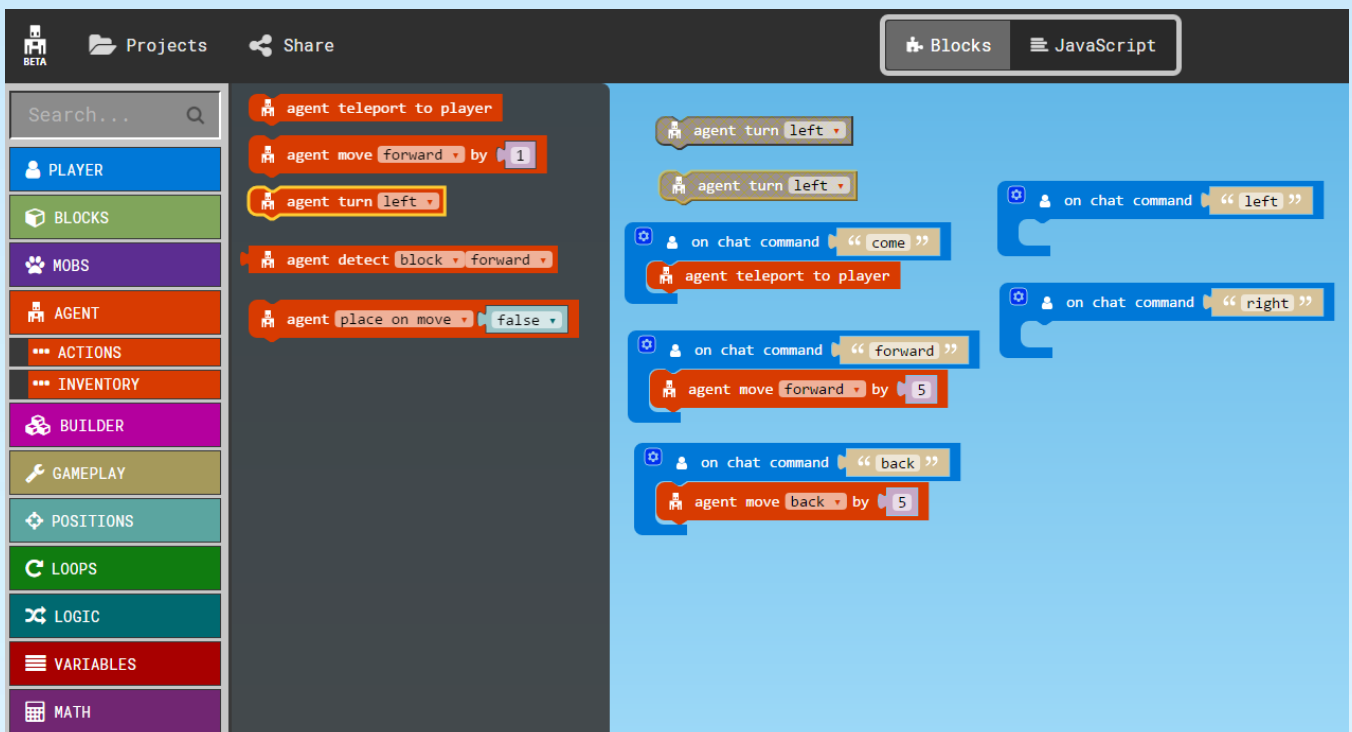
Step 11 – Under the **On Chat Command “Back”** block, using the drop-down menu change the direction the agent will move to **back** in the **Agent Move** block.



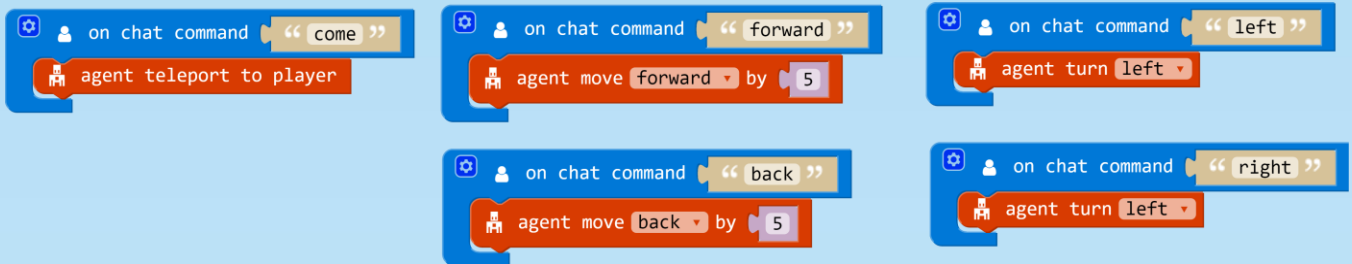
Step 12 – Under the **On Chat Command “Back”** block, change the number of blocks the agent will move backwards by to **5** in the **Agent Move** block.



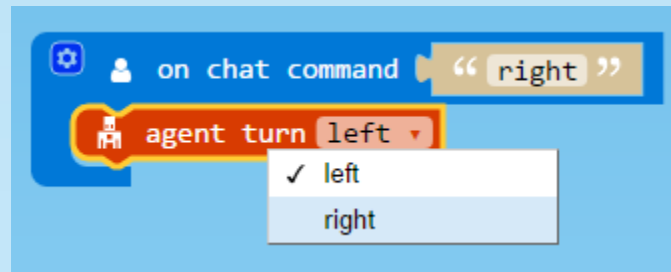
Step 13 – From the **Agent** Toolbox drawer, drag and drop 2 of the **Agent Turn** blocks onto the coding Workspace.



Step 14 – Drag 1 of the **Agent Turn** blocks under the **On Chat Command “Left”** block, and drag the other one under the **On Chat Command “Right”** block.



Step 15 – Under the **On Chat Command “Right”** block, in the **Agent Turn** block, use the drop-down menu to change the direction to **right**

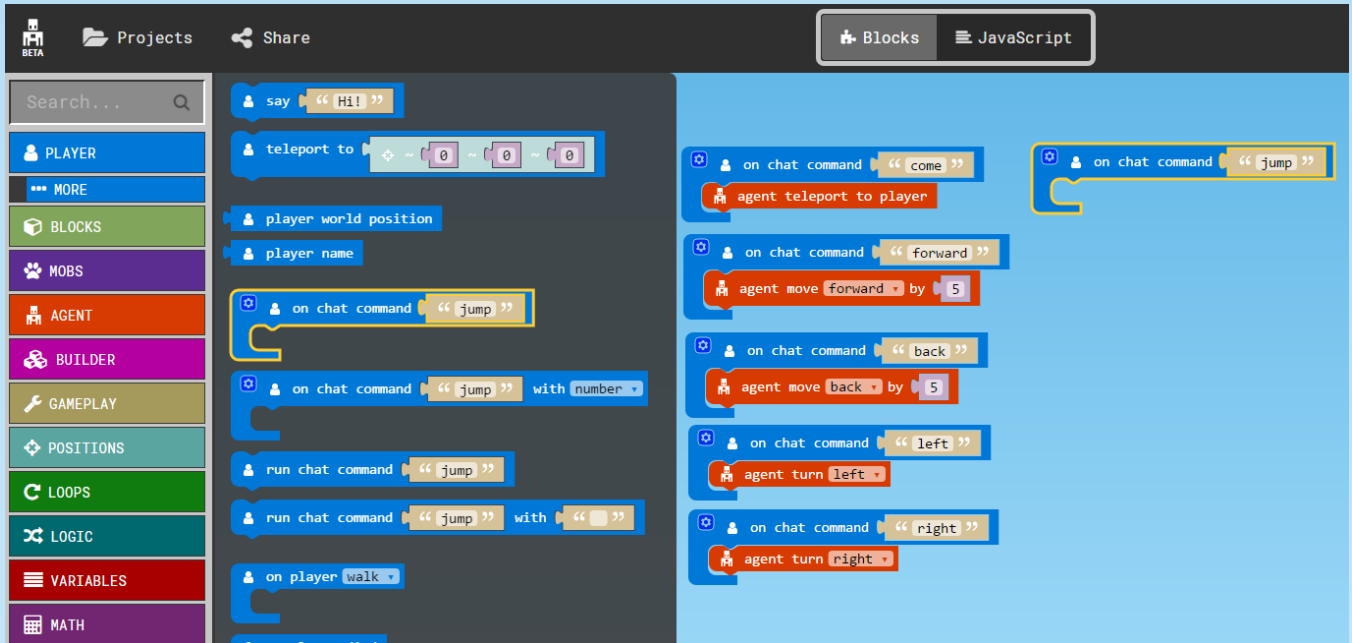


Step 16 – In your Minecraft game, press 't' to open the chat screen. Type "forward" and press Enter. Your Agent should move forward 5 blocks. Try using your other Agent commands "back", "left", and "right" to move your agent around in Minecraft.

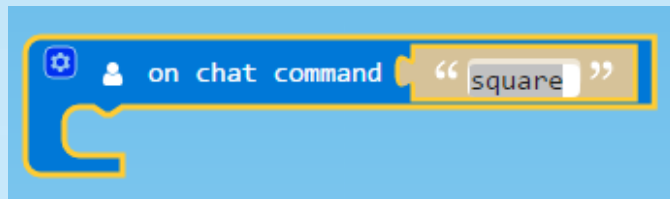
Step 17 – Now, let's add a command to have our Agent build something for us! Our Agent has his/her own Inventory, so we'll need to make sure we give him/her some blocks first. In your Minecraft game, right-click on your Agent. This should open his/her inventory. Move some blocks over from your inventory to your Agent's inventory.



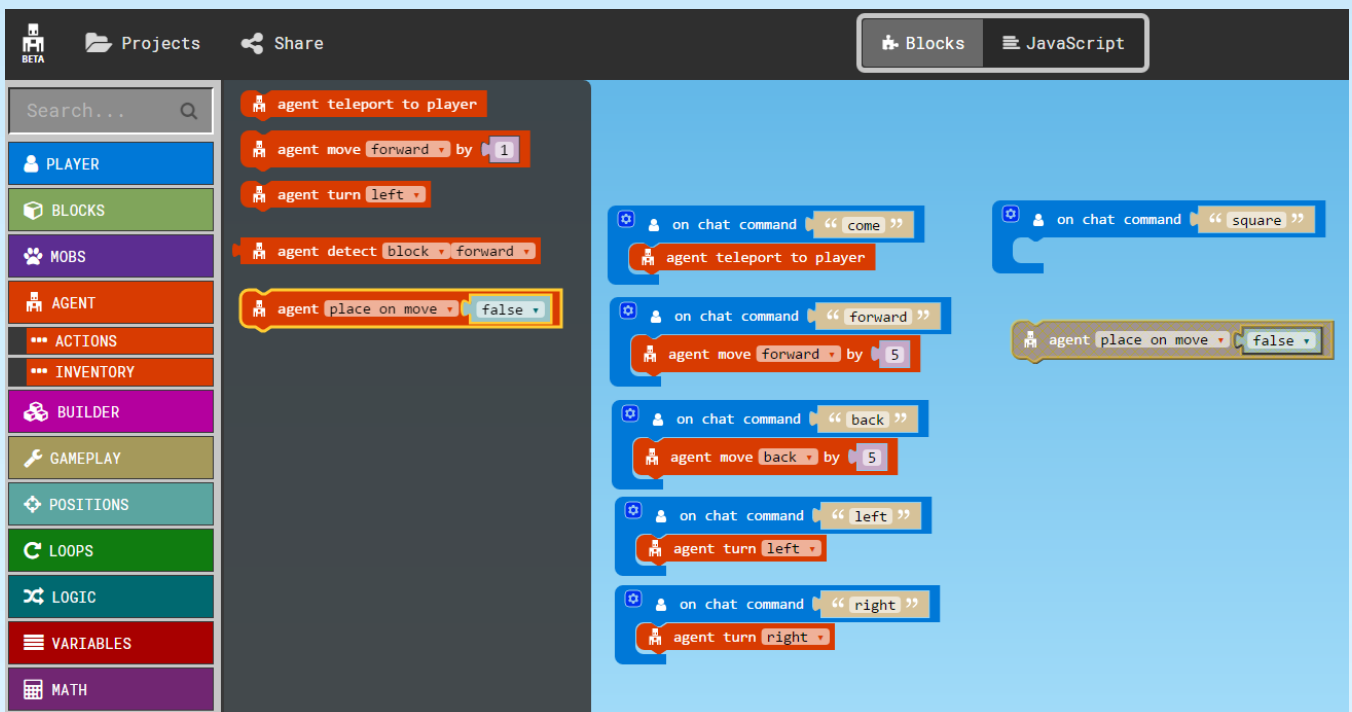
Step 18 – Let's have our agent build a square for us. This exercise introduces repetition and loops. From the **Player** Toolbox drawer, drag and drop the **On Chat Command** block onto the coding Workspace.



Step 19 – Rename this **On Chat Command** to "square"



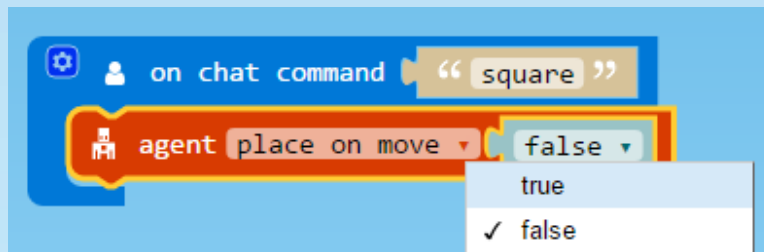
Step 20 – From the **Agent** Toolbox drawer, drag and drop the **Agent Place on Move** block onto the coding Workspace. This block will put your Agent into "Builder Mode", so that he/she will automatically place a block every time he/she moves.



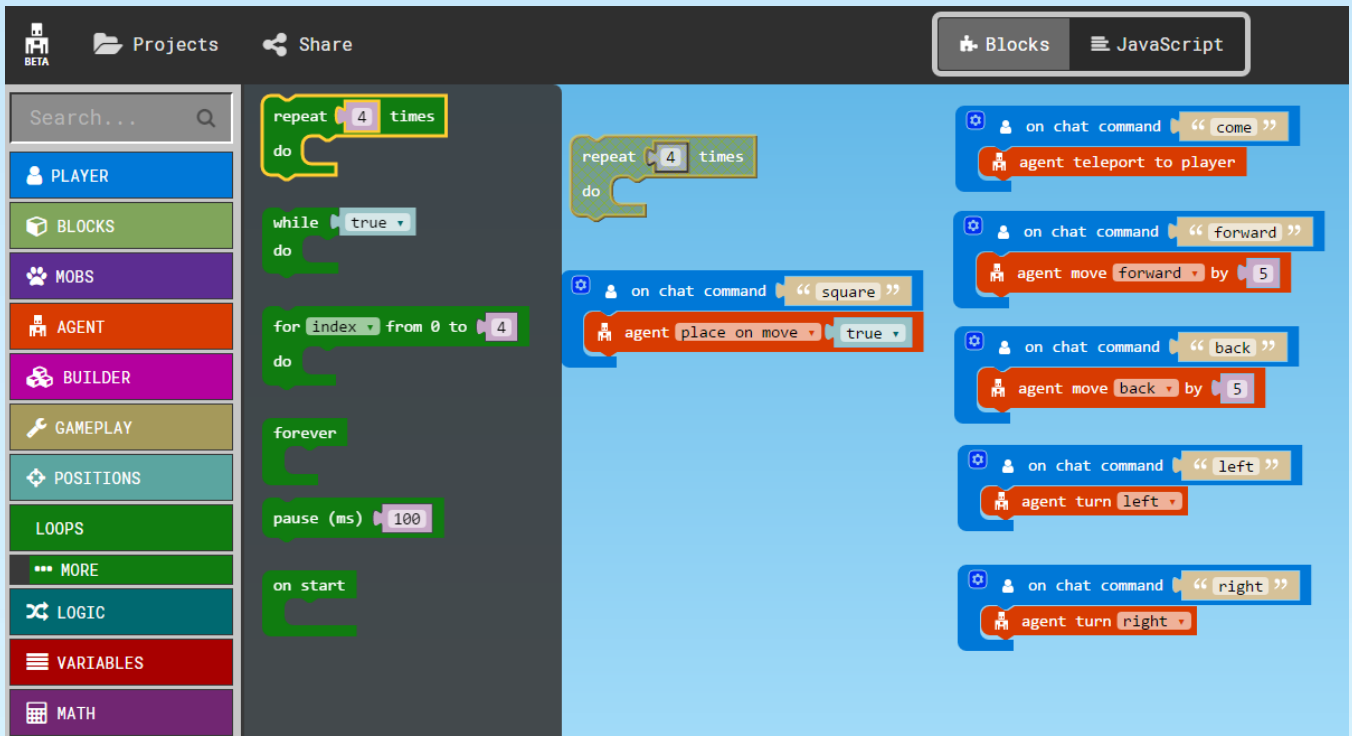
Step 21 – Drag the **Agent Place on Move** block under the **On Chat Command “Square”** block



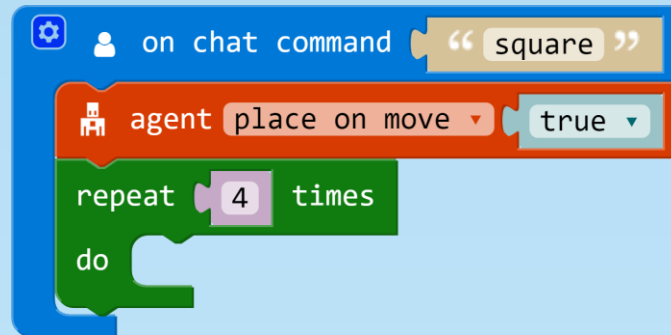
Step 22 – In the **Agent Place on Move** block, using the drop-down menu, select **true**



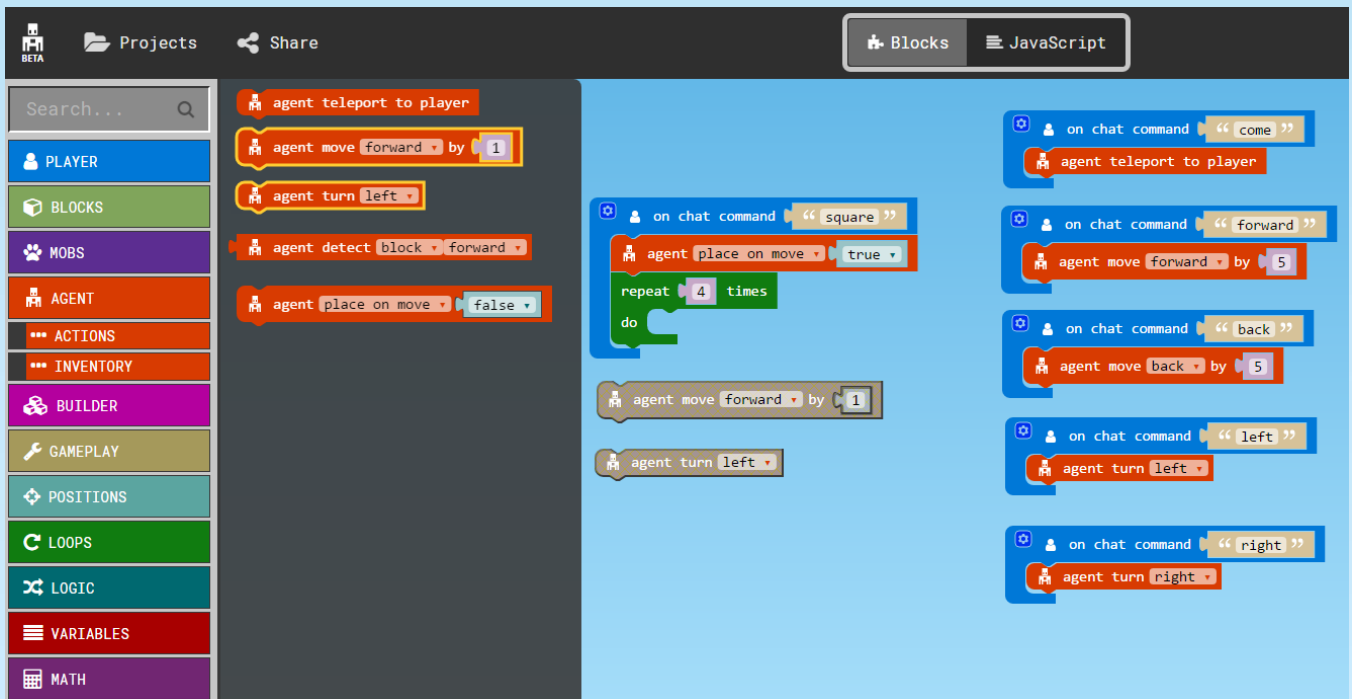
Step 23 – To build a square, we need the Agent to move forward and turn 4 times. From the **Loops** Toolbox drawer, drag and drop the **Repeat** block onto the coding Workspace



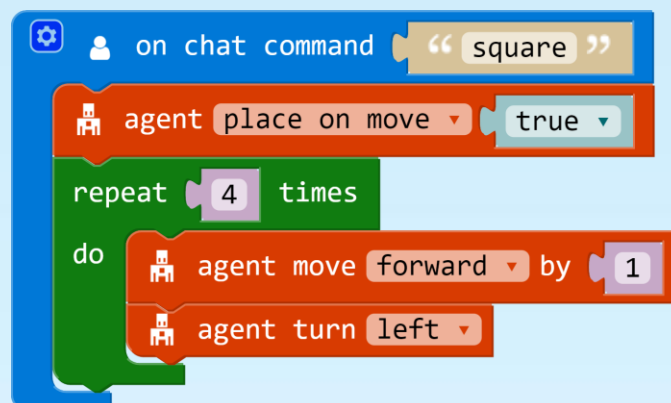
Step 24 – Drag the **Repeat** block under the **Agent Place on Move** block



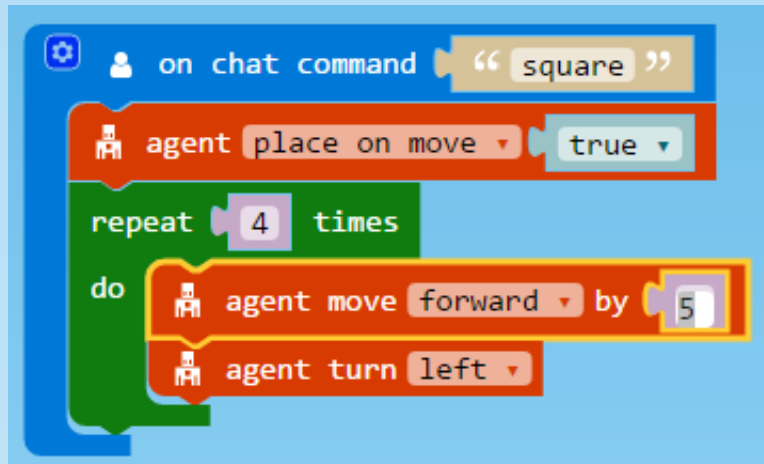
Step 25 – From the **Agent** Toolbox drawer, drag and drop the **Agent Move** block and the **Agent Turn** block onto the coding Workspace.



Step 26 – Drag the **Agent Move** block and the **Agent Turn** block into the **Repeat** loop

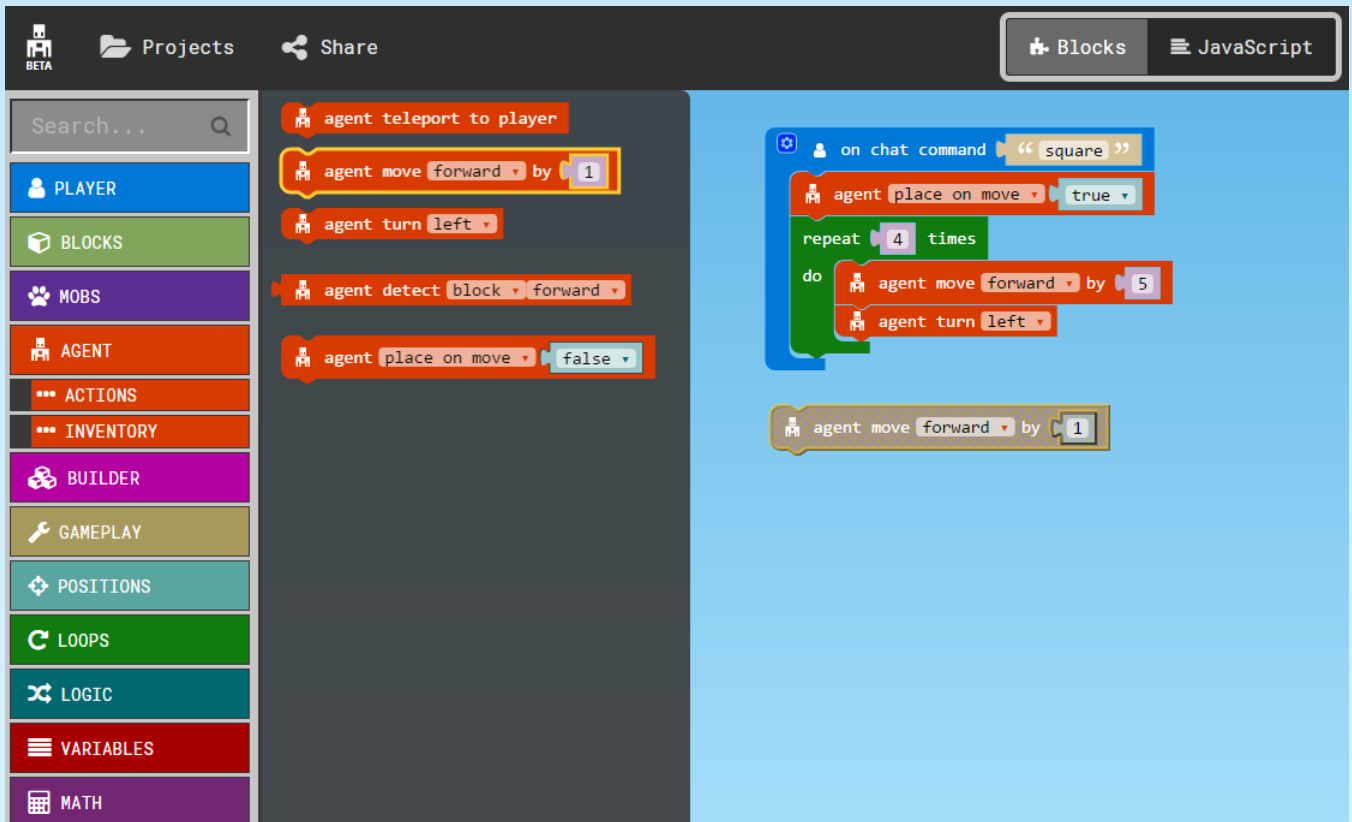


Step 27 – In the **Agent Move** block, change the number of blocks to 5

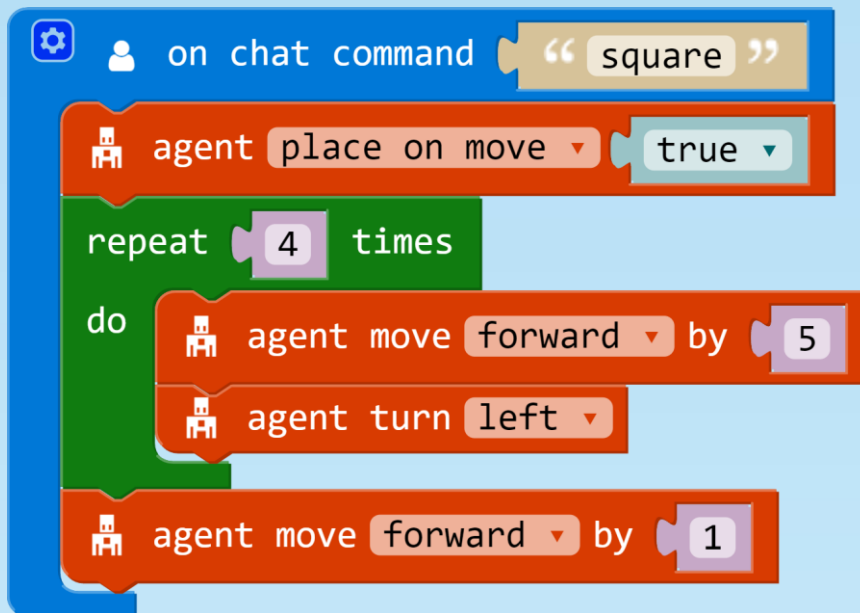


Step 28 – In your Minecraft game, press 't' to open the chat screen. Type "square" and press Enter. Do you notice that your agent can't place the last block? That's because he/she is running into the first block. So, let's handle placing this last block in code.

Step 29 – From the **Agent** Toolbox drawer, drag and drop an **Agent Move** block onto the coding Workspace.



Step 30 – Drag the **Agent Move** block under the Repeat loop



Step 31 – In your Minecraft game, find a clear space for your Agent to build, then press 't' to open the chat screen. Type "square" and press Enter. Now you should see your Agent complete building a square!

