

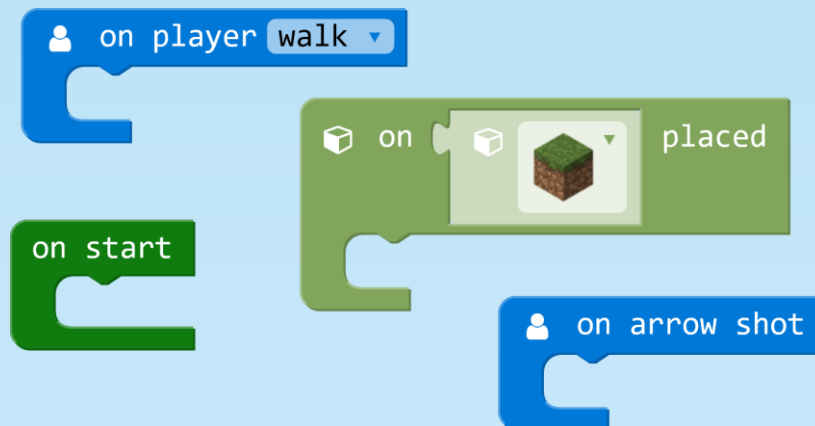
# Microsoft MakeCode for



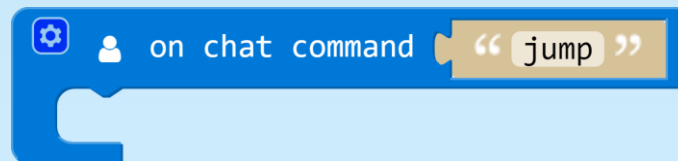
**Lesson Title:** Make it Rain!

**Introduction/Background:** An "event" in computer science is an action or occurrence detected by a computer. For example, when someone clicks the button on their mouse, it generates a "mouse click event" for the computer. Microsoft MakeCode uses an [event-driven programming model](#) where user code is triggered as a response to an event.

Examples of events in MakeCode for Minecraft include:



In Microsoft MakeCode, there is a special event called the "**On Chat Command**" which is a useful way to teach students about functions.



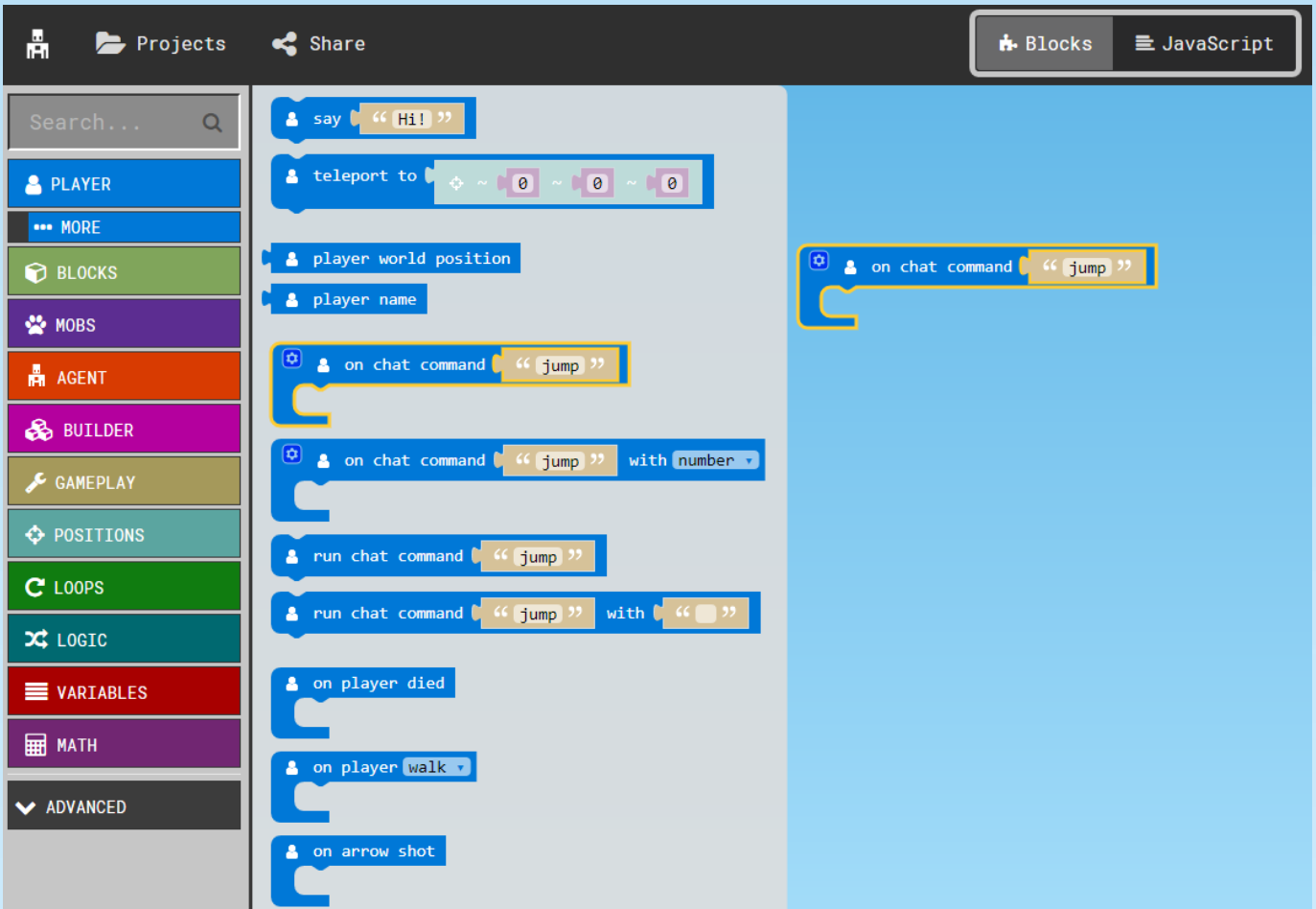
In computer science, a "function" is a way to group commands together. For example, the function of Waving might group the following commands together:

- Raise hand
- Move hand left
- Move hand right

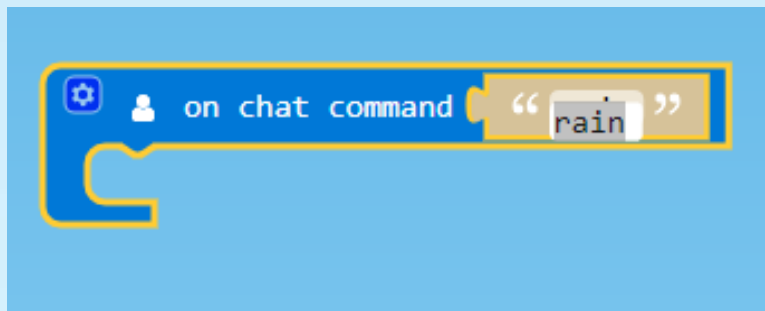
Students can type the name of their **On Chat Command** functions into the Minecraft game to execute, or run that function.

**Lesson Steps:** In this lesson, we will use the On Chat Command to make it rain in Minecraft.

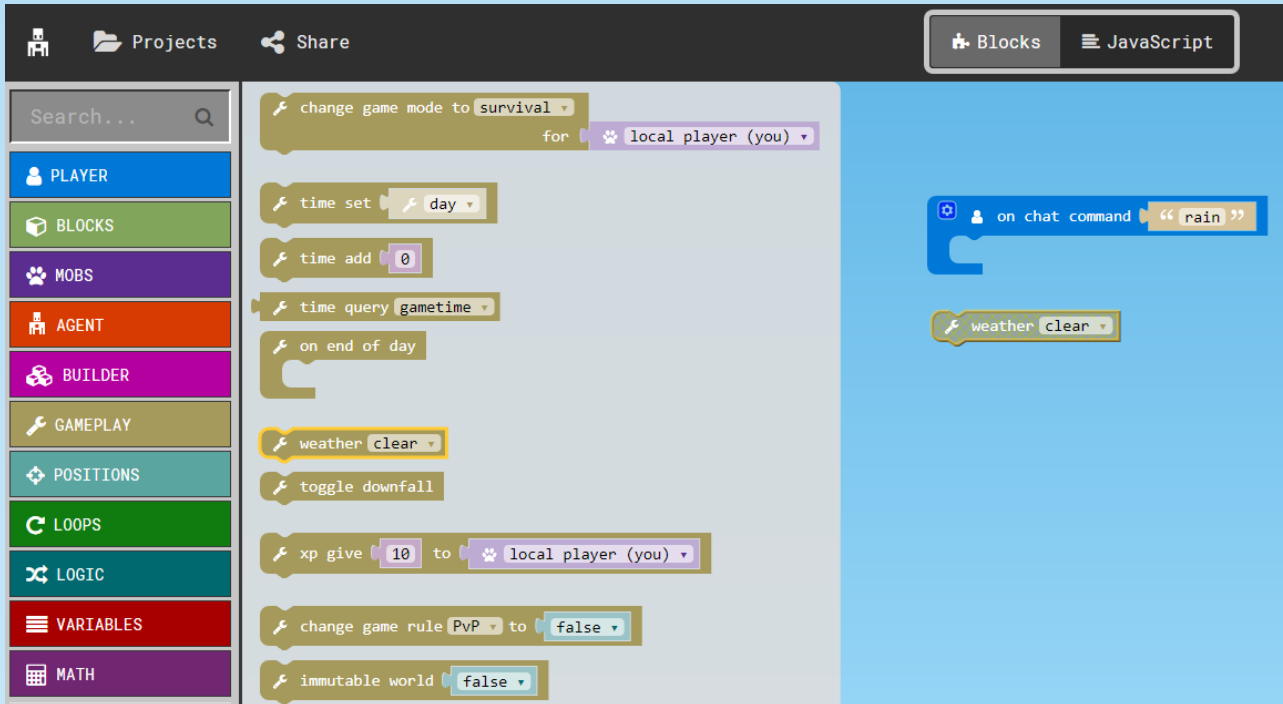
**Step 1** – From the **Player** Toolbox drawer, drag and drop the **On Chat Command** block onto the coding Workspace.



**Step 2** – Rename this command to "rain"

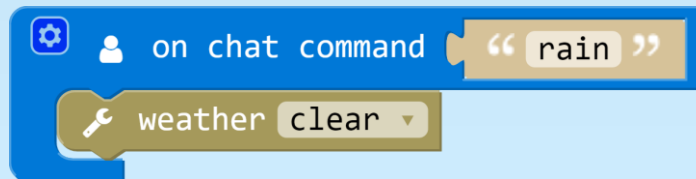


**Step 3** – From the **GamePlay** Toolbox drawer, drag and drop the **Weather** block onto the coding Workspace.

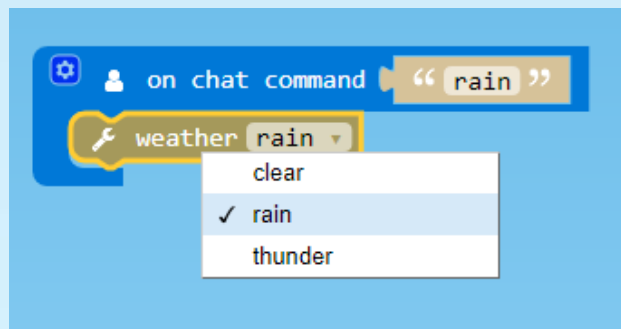


Notice that when you place the block onto the coding Workspace, it becomes disabled (turns grey with hashmarks). This means this block won't run in your current program. That is because it is not associated with an event.

**Step 4** – Drag the **Weather** block under the **On Chat Command** event



**Step 5** – Using the drop-down menu, change the weather to rain



**Step 6** – In your Minecraft game, press 't' to open the chat screen. Type "rain" and press Enter. You should see it start raining in Minecraft!

**Lesson Extension:** Functions can also have [Parameters](#), or arguments. These are values that are passed into the function. For example, the function of Waving might include a parameter that specifies which hand to wave:

**Waving ( right )**

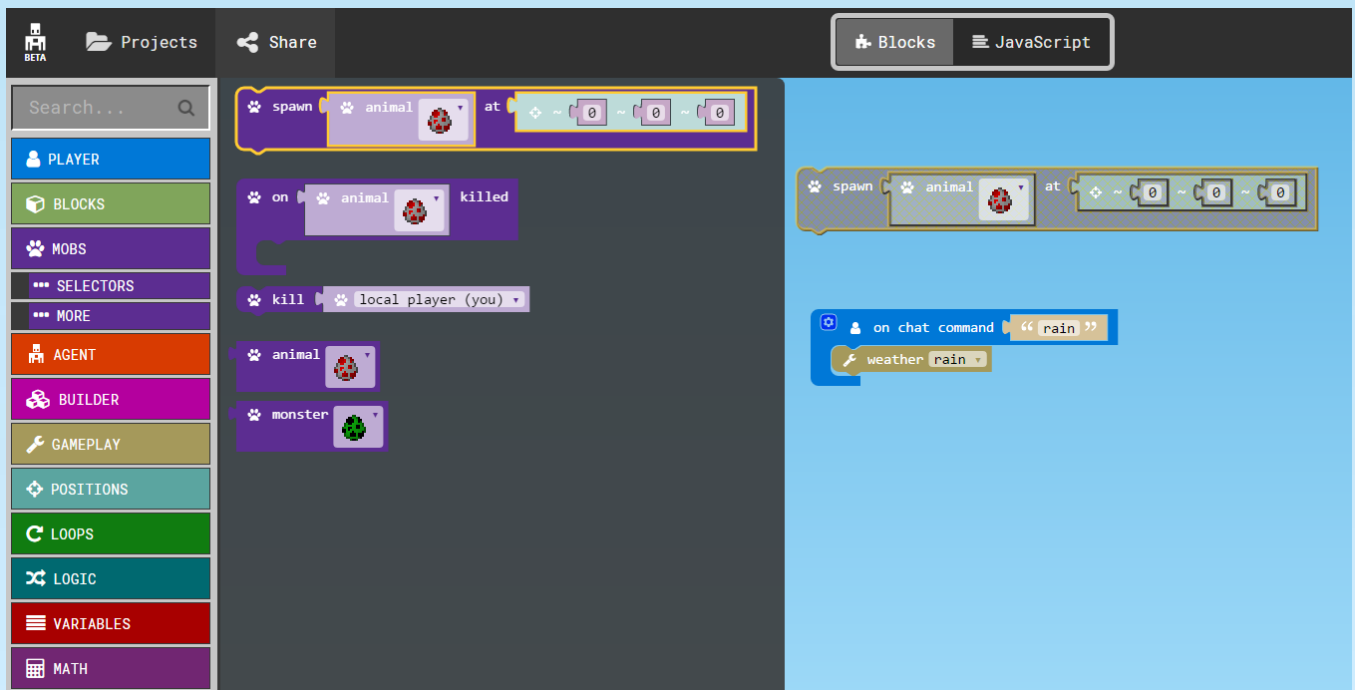
- Raise ( right ) hand
- Move ( right ) hand left
- Move ( right ) hand right

**Waving ( left )**

- Raise ( left ) hand
- Move ( left ) hand left
- Move ( left ) hand right

Let's try adding a parameter to our **On Chat Command**, and make our Rain function more exciting by making it Rain Cats and Dogs. Or, in the Minecraft world, let's make it Rain Ocelots and Wolves!

**Step 7** – From the **Mobs** Toolbox drawer, drag and drop the **Spawn Animal at Position** block onto the coding Workspace.



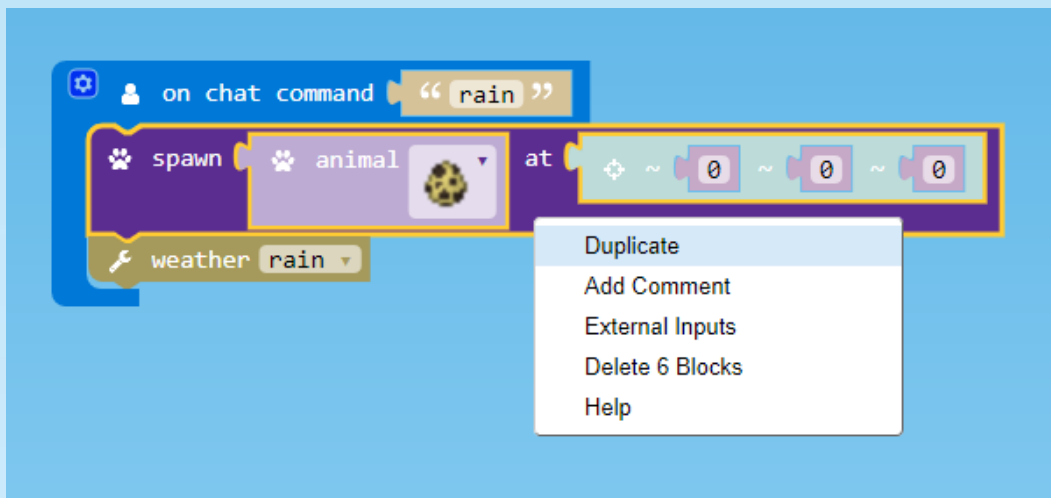
**Step 8** – Drag the **Spawn Animal at Position** block under the **On Chat Command** event



**Step 9** – Use the Animal block drop-down menu to select an ocelot



**Step 10** – Right-click on the **Spawn Animal at Position** block to open the context menu, and select Duplicate to copy the block



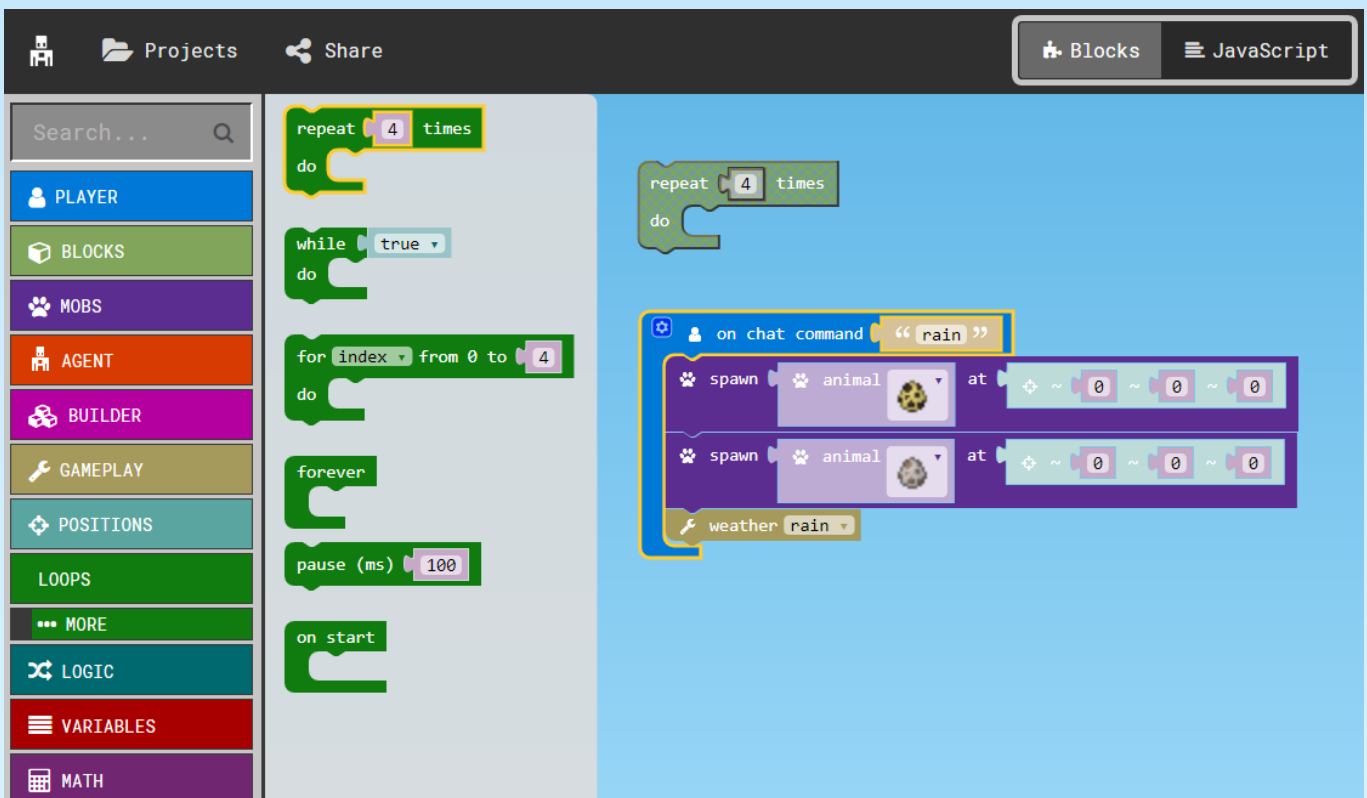
**Step 11** – Drag the second Spawn Animal at Position block underneath the first



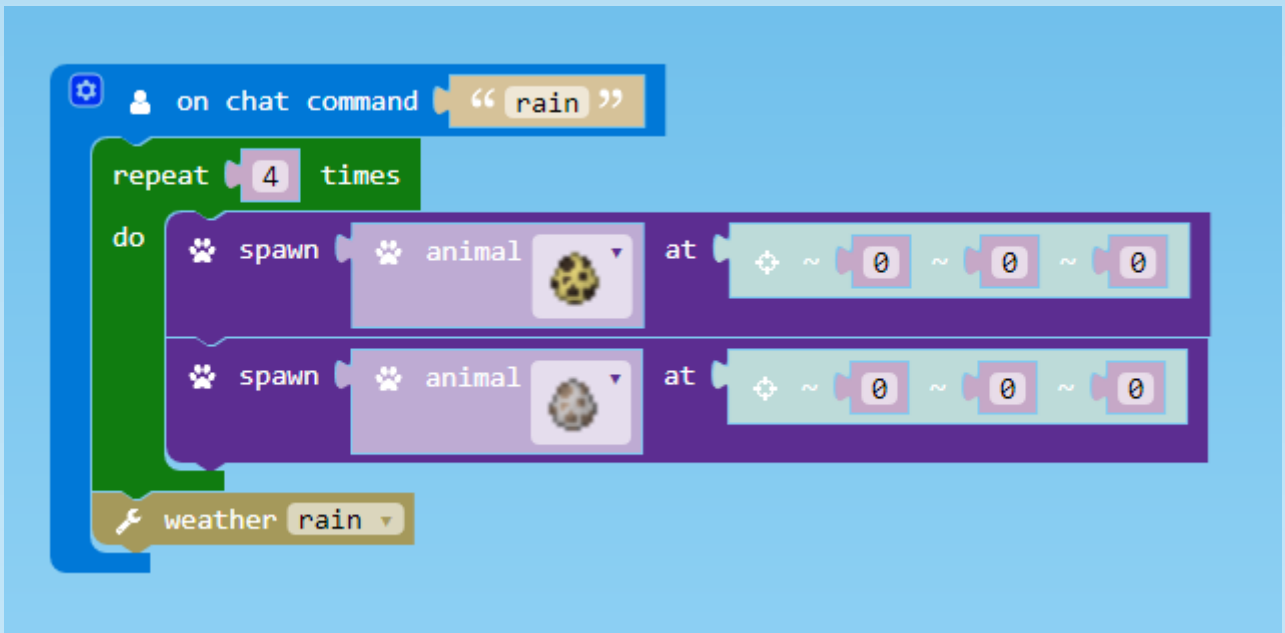
**Step 12** – Use the Animal block drop-down menu on the second **Spawn Animal at Position** block to select a wolf



**Step 13** – Our Rain function will now spawn 1 ocelot and 1 wolf at the Player's position before making it rain. Let's use a parameter and a loop to spawn multiple animals. From the **Loops** Toolbox drawer, drag and drop the **Repeat** block onto the coding Workspace.

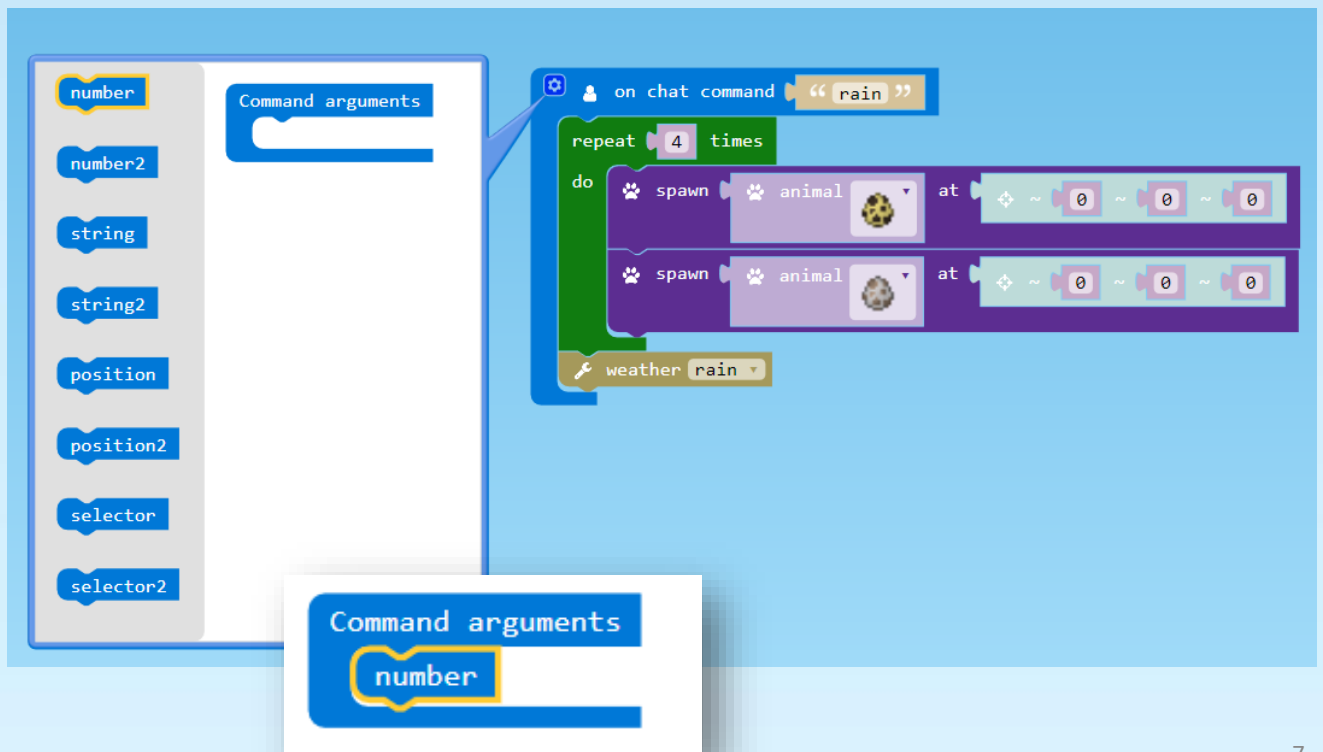


**Step 14** – Position the **Repeat** loop under the **On Chat Command** block, and drag the 2 **Spawn Animal at Position** blocks inside the **Repeat** loop

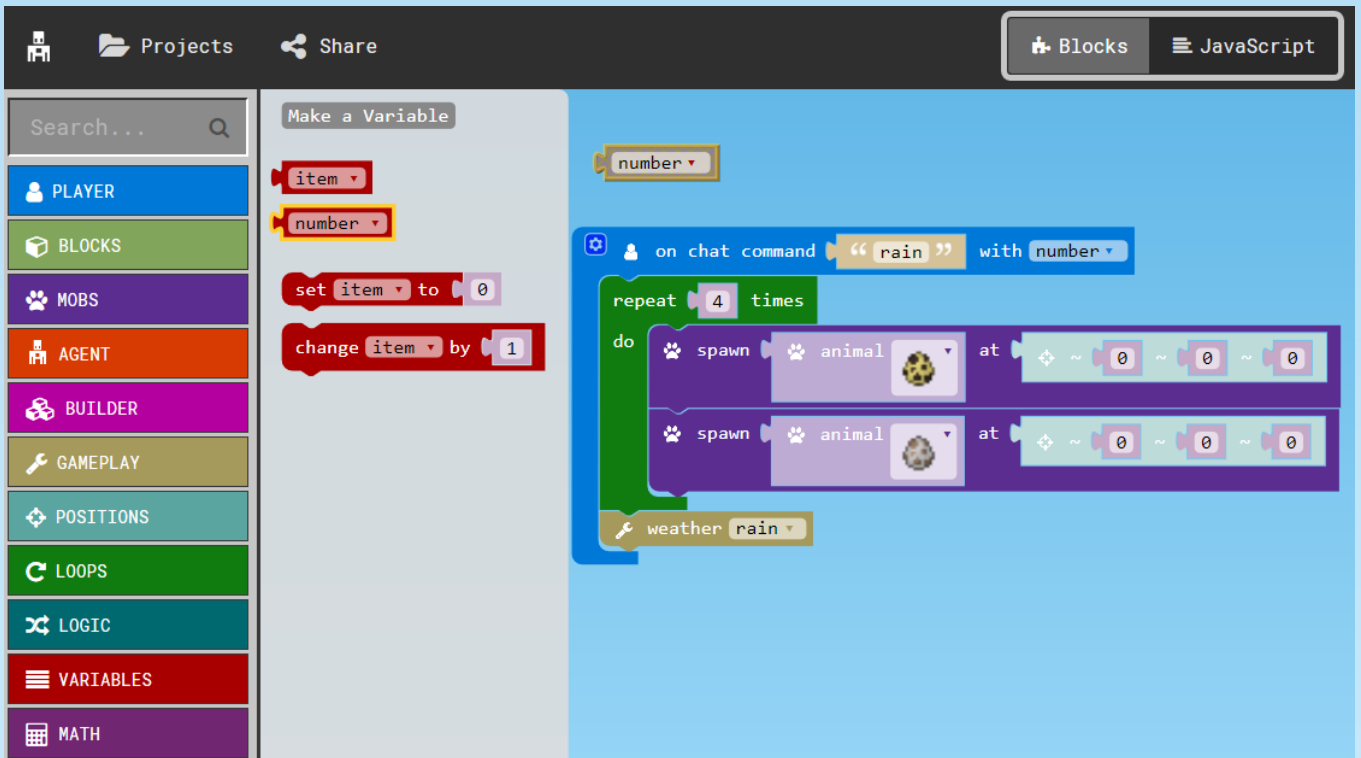


Note: make sure to keep the Weather block outside the Repeat loop

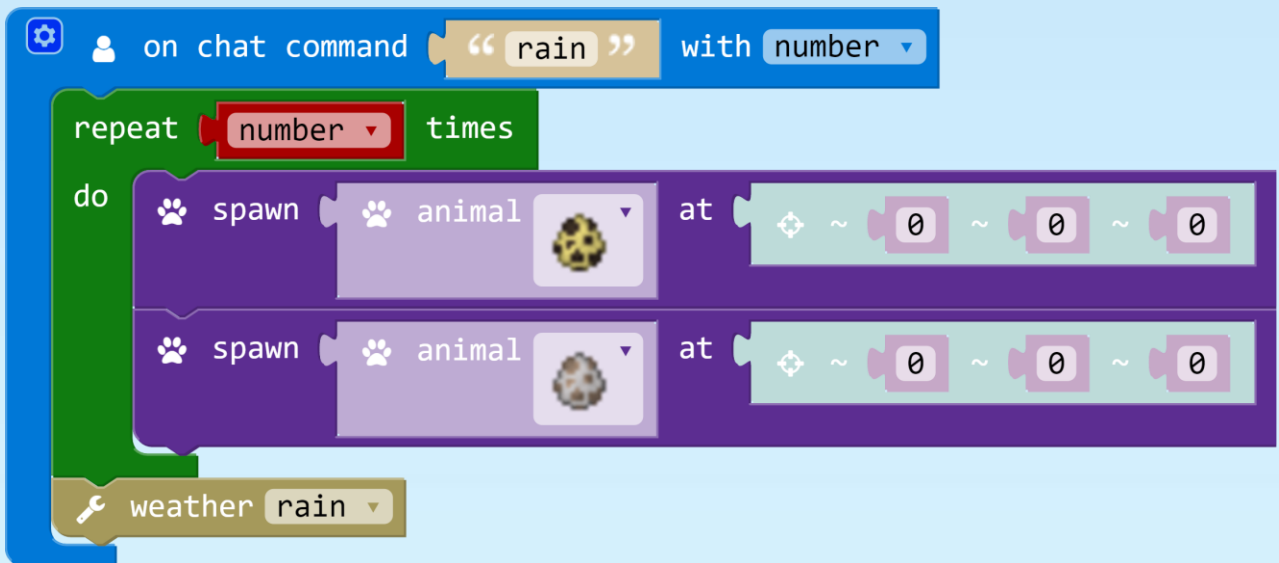
**Step 15** – Click on the blue cog/gearwheel icon in the **On Chat Command** block, drag and drop a number parameter block under the Command Arguments block. This will create a number parameter for our Rain function. Click on the blue cog/gearwheel icon again to close the Parameters menu.



**Step 16** – From the **Variables** Toolbox drawer, drag and drop the **number** block onto the coding Workspace.

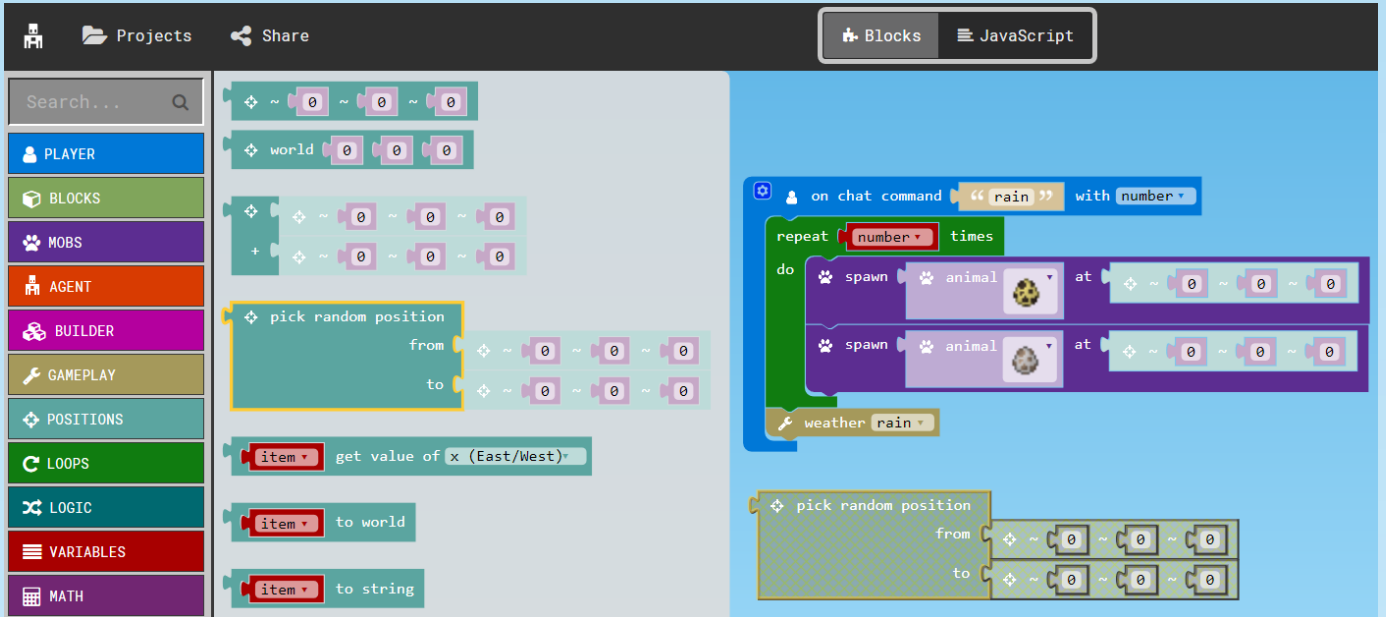


**Step 17** – Drag the **number** block into the **Repeat** loop block

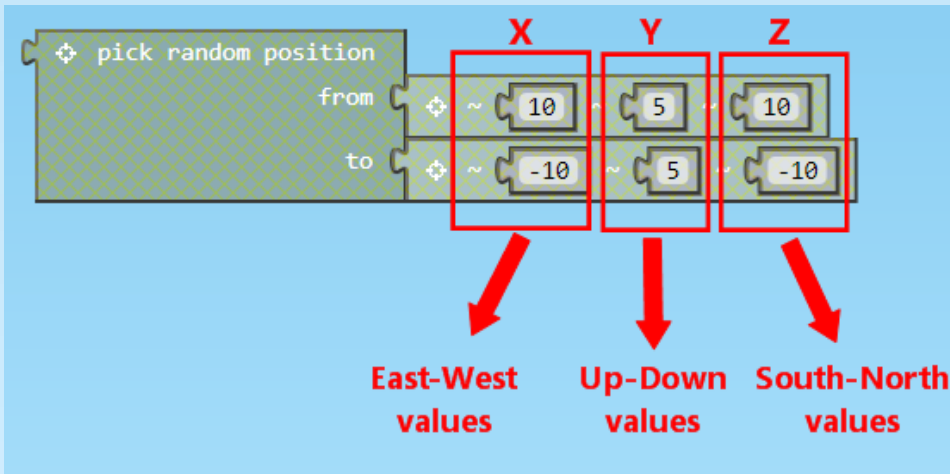




**Step 18** – Let’s change the position where our Ocelots and Wolves are spawning. Right now, they are spawning at the Player’s position at ~0 ~0 ~0. From the **Positions** Toolbox drawer, drag and drop a **Pick Random Position** block onto the coding Workspace.



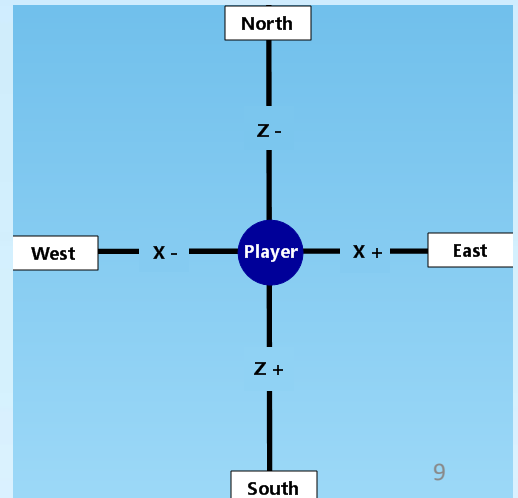
**Step 19** – We want our animals to spawn 5 blocks above our Player, and at random locations 10 blocks all around our Player. Set the values of your **Pick Random Position** block according to the following:



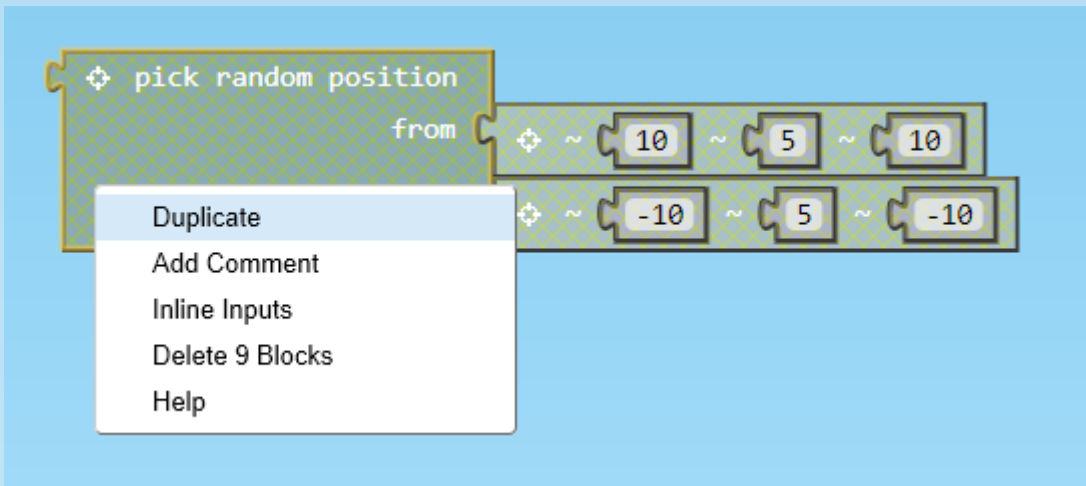
Working with positions can be tricky. The **Positions** blocks use X, Y, Z coordinates to represent directions in the game, where:

- East = Positive X-axis
- West = Negative X-axis
- Up = Positive Y-axis
- Down = Negative Y-axis
- South = Positive Z-axis
- North = Negative Z-axis

For more information, please see the [Positions reference documentation](#)



**Step 20** – Right-click on the **Pick Random Position** block to open the context menu, and select Duplicate to copy the block



**Step 21** – Drag and drop the 2 **Pick Random Position** blocks into the **Spawn Animal at Position** blocks. Your completed program should look like this:



**Step 22** – In your Minecraft game, press 't' to open the chat screen. Type: "rain 4". You should see it start raining 4 ocelots and wolves all around you in Minecraft! Now try typing different numbers into your Rain function: "rain 40", or "rain 400".