

**Session Title:**  Learn to program with Minecraft Plugins (1)

If you enjoy creating in Minecraft, but sometimes feel the built-in capabilities of the game are not enough and you want to do something more? This stream is aimed at older & more experienced ninjas, who:

* Know how to program in some language (e.g. a blue belt in Scratch)
* Already have purchased and know how to use the PC edition of Minecraft
* Know how to edit file and know your way around your computer’s filesystem
* Ideally have already installed a mod yourself

**Plan for today:**

1. We are going to install the CraftBukkit server which is a version of the Minecraft server software which allows easy addition of 'Mods' and extensions to Minecraft
2. We are going to Install ScriptCraft into the CraftBukkit server that we installed. ScriptCraft is a mod for Minecraft that allows you to write programs to build objects in Minecraft.
3. Try out some ScriptCraft commands
4. Write our first mod or two in ScriptCraft

**Step 0: Prepare**

***We have put all the software that you will need for this session onto a DVD*** which you can use to install the software from. Before you start installing any minecraft related software, you’ll first need to install the Java environment, a programmer’s editor and a zip program if you don’t have one already installed.

Java <http://www.oracle.com/technetwork/java/javase/downloads/java-se-jre-7-download-432155.html>

JEdit

<http://jedit.org/index.php?page=download>

**Step 1 : Install CraftBukkit Server [*Windows*]**

1. Create a new folder on your desktop called craftbukkit
2. Copy the craftbukkit-1.6.4-R2.0.jar file from the DVD folder common/craftbukkit-1.6.4-R2.0.jar into the craftbukkit folder you have just created on the desktop
3. Open the JEdit editor and type:  
     
   java -Xmx1024M -jar craftbukkit-1.6.4-R2.0.jar -o true  
   PAUSE
4. Save the file as run.bat (not as a .txt) into the craftbukkit directory.
5. From your file explorer open the craftbukkit directory and double click run.bat and you're away!
6. You should see a command window with a line saying “Starting minecraft server”
7. To shut down, issue the "stop" command in console.

**Step 1 : Install CraftBukkit Server [*Linux/Ubuntu/OSX*]**

1. Create a new folder on your home directory called craftbukkit
2. Copy the craftbukkit-1.6.4-R2.0.jar file from the DVD folder  
   common/craftbukkit-1.6.4-R2.0.jar into the craftbukkit folder you have just created on the  
   desktop
3. Move to the above directory in terminal with 'cd ~/craftbukkit'
4. Create a new file in the minecraft folder and name it craftbukkit.sh  
   > nano craftbukkit.sh
5. For Linux edit the file and copy this into it:  
     
   #!/bin/sh  
   BINDIR=$(dirname "$(readlink -fn "$0")")  
   cd "$BINDIR"  
   java -Xmx1024M -jar craftbukkit-1.6.4-R2.0.jar -o true
6. For OSX edit the file and copy this into it:  
     
   #!/bin/bash  
   cd "$( dirname "$0" )"  
   java -Xmx1024M -jar craftbukkit.jar -o true
7. Make the file executable, either by running "chmod +x ~/craftbukkit/craftbukkit.sh" in a terminal, or by changing the permissions in the file's properties.
8. Then, in terminal, type '~/craftbukkit/craftbukkit.sh' to run to start the server.
9. When you're done playing around, issue the "stop" command in console.

**Step 2 : Install ScriptCraft**

1. Make sure you have started the CraftBukkit server, then once it has started up, stop it by typing 'stop'.
2. If you go to the craftbukkit folder (see step 1) you should see some new files and subfolders.
3. Download a copy the scriptcraft.jar from <http://scriptcraftjs.org/download/> or copy it from the common folder on the dvd to the craftbukkit/plugins folder (This folder won't be created until you run Bukkit for the first time (see previous step).
4. Start up the craftbukkit server again
5. In the CraftBukkit command window type js 1 + 1 and hit enter. You should see > 2 .
6. ScriptCraft is now successfully installed !

**Step 3 : First steps**

1. Launch Minecraft (keep the Bukkit Command window open).
2. Click 'Multi-Player'
3. Click 'Add Server'
4. Type any name you like in the name field then type localhost in the address field. localhost is a special internet address that points to your own computer.
5. Click 'Join Server' to join the craftbukkit server.
6. To run ScriptCraft commands, you have to be an op, to make yourself an op in the Bukkit Command window type :  
   >op {your username}
7. Back in Minecraft once you've joined the game, press the / key located at the bottom right of your keyboard. A prompt will appear. Type the following then press enter:   
   > js 1 + 1   
   The number 2 should be displayed....   
   Well Done! You've just confirmed you can run Javascript code from within the Minecraft Console.

**Step 4 : Configuring your Server (optional)**

Once you've installed CraftBukkit, depending on your specific needs, you might want to consider setting the following properties in the server.properties file...

# completely flat worlds are best for building from scratch

level-type=FLAT

generate-structures=false

# creative mode

gamemode=1

pvp=false

# turns off authentication (for classroom environments)

online-mode=false

spawn-npcs=false

spawn-monsters=false

**Your First Minecraft Mod!**

So, You've learnt a little bit about Javascript and what the Drone() object can do, let's use that knowledge to create a Minecraft Mod!

Startup JEdit and create a new file and type the following...

exports.greet = function( player ) {

player.sendMessage('Hi ' + player.name);

}

... then save the file in a new directory craftbukkit/plugins/scriptcraft/plugins/{your\_name} (replace {your\_name} with your own name) and call the file greet.js

Now switch back to the Minecraft game and type...

/js refresh()

... to reload all of the server plugins. Your mod has just been loaded. Try it out by typing this command...

/js greet(self)

... it should display ...

Hi {your-username-here}

... where {your-username-here} will be replaced with your own minecraft username. Congratulations - You've just written your very first Minecraft Mod!

**Your Second Minecraft mod**

In this mod we are going to create a new javascript mod so that when we call it from Minecraft it will create a skyscraper with the number of floors we specify.

So either copy the file myskyscraper.js from the javascript-code directory on the dvd or open your JEdit again and create a new file in your scriptcraft/plugins/{your-name} directory, name the file myskyscraper.js, then type the following

**var** myskyscraper **=** **function**(floors) {  
 **var** i ;  
 **if** ( **typeof** floors **==** 'undefined' ) {  
 floors **=** 10;  
 }  
 **this**.chkpt('myskyscraper'); *// saves the drone position so it can return there later*  
 **for** ( i **=** 0; i **<** floors; i**++** ) {  
 **this**.box(blocks.iron,20,1,20)  
 .up()  
 .box0(blocks.glass\_pane,20,3,20)  
 .up(3);  
 }  
 **return** **this**.move('myskyscraper'); *// return to where we started*  
};  
**var** Drone **=** require('../drone/drone').Drone;   
Drone.extend('myskyscraper',myskyscraper);

***Line 1 :*** creates a new function called myskyscraper that will take a single parameter floors so that when you eventually call the myskyscraper() function you can tell it how many floors you want built, ie myskyscraper() would create a skyscraper with 10 floors/

***Line 3 :*** The first statement in the function if (typeof floors == 'undefined'){ floors = 10; } sets floors to 10 if no parameter is supplied.

***Line 6:*** The next statement this.chkpt('myskyscraper') saves the position of the Drone so it can eventually return to where it started when finished building (I don't want the drone stranded atop the skyscraper when it's finished).

***Lines 6 - 11:*** Then comes the for loop. I loop from 0 to floors and each time through the loop I build a single floor.

When the loop is done I return the drone to where it started.

***Line 12 :*** Loads the drone module (it must be loaded before I can add new features to it)

***Line 13 :*** The last line extends the 'Drone' object so that now it can build skyscrapers among other things.

Once you've typed in the above code and saved the file, type reload in your in-game prompt, then type ...

/js myskyscraper(2);

... A two-story skyscraper should appear. If you're feeling adventurous, try a 10 story skyscraper! Or a 20 story skyscraper! Minecraft has a height limit (256 blocks from bedrock) beyond which you can't build. If you try to build higher than this then building will stop at that height.

***Sources :***

The original sources of this session are based on the following sources

[*http://cdathenry.wordpress.com/2013/10/05/modderdojo-week-1-getting-started-with-scriptcraft-and-javascript/*](http://cdathenry.wordpress.com/2013/10/05/modderdojo-week-1-getting-started-with-scriptcraft-and-javascript/)

The script craft docs provide an excellent overview of javascript for use with the ScriptCraft plugin

<https://github.com/walterhiggins/ScriptCraft/blob/master/docs/YoungPersonsGuideToProgrammingMinecraft.md>