

# MINECRAFT

Craft your World!



Learn to Code with Minecraft  
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# Environment Setup

- Sublime Text Editor is installed
- Java 7 is installed
- Download CraftBukkit (version 1.6.4-R2.0)
- (Windows Only!) BusyBox is installed



# Introduction to Command Line

\$ cd – change directory

\$ pwd – print working directory

\$ ls – list files in directory

\$ mkdir – make a new directory

\$ cp – copy file

\$ mv – move file

\$ rm – remove a file

```
joe@casper:~/minecraft-plugins$ cd code
joe@casper:~/minecraft-plugins/code$ pwd
/home/joe/minecraft-plugins/code
joe@casper:~/minecraft-plugins/code$ ls
HelloWorld  mkplugin.sh
joe@casper:~/minecraft-plugins/code$ mkdir TestPlugin
joe@casper:~/minecraft-plugins/code$ ls
HelloWorld  mkplugin.sh  TestPlugin
joe@casper:~/minecraft-plugins/code$ cp mkplugin.sh mkp.sh
joe@casper:~/minecraft-plugins/code$ ls
HelloWorld  mkplugin.sh  mkp.sh  TestPlugin
joe@casper:~/minecraft-plugins/code$ mv mkp.sh TestPlugin/
joe@casper:~/minecraft-plugins/code$ ls TestPlugin/
mkp.sh
joe@casper:~/minecraft-plugins/code$ rm TestPlugin/mkp.sh
joe@casper:~/minecraft-plugins/code$ ls TestPlugin/
joe@casper:~/minecraft-plugins/code$ rm -rf TestPlugin/
joe@casper:~/minecraft-plugins/code$ ls
HelloWorld  mkplugin.sh
joe@casper:~/minecraft-plugins/code$
```



# Create Server (Option 1: Use git)

```
joe@casper:~$ git --version
git --version
git version 1.8.1.2
joe@casper:~$ git clone https://github.com/joedean/minecraft-plugins.git
git clone https://github.com/joedean/minecraft-plugins.git
Cloning into 'minecraft-plugins'...
remote: Counting objects: 9, done.
remote: Compressing objects: 100% (7/7), done.
remote: Total 9 (delta 0), reused 6 (delta 0)
Unpacking objects: 100% (9/9), done.
joe@casper:~$ cd minecraft-plugins/server/
cd minecraft-plugins/server/
joe@casper:~/minecraft-plugins/server$ ls
ls
start-minecraft-server.sh
joe@casper:~/minecraft-plugins/server$ mv ~/Downloads/craftbukkit.jar .
mv ~/Downloads/craftbukkit.jar .
joe@casper:~/minecraft-plugins/server$ ./start-minecraft-server.sh
./start-minecraft-server.sh
23:09:52 [INFO] Starting minecraft server version 1.6.4
23:10:15 [INFO] Done (22.017s)! For help, type "help" or "?"
>
```

- If you don't have git then go to option 2
- Homework: download and install git (<http://git-scm.com/book/en/Getting-Started-Installing-Git>)
- Sign-up for a Github account at [github.com](http://github.com) (not required but, nice to have!)



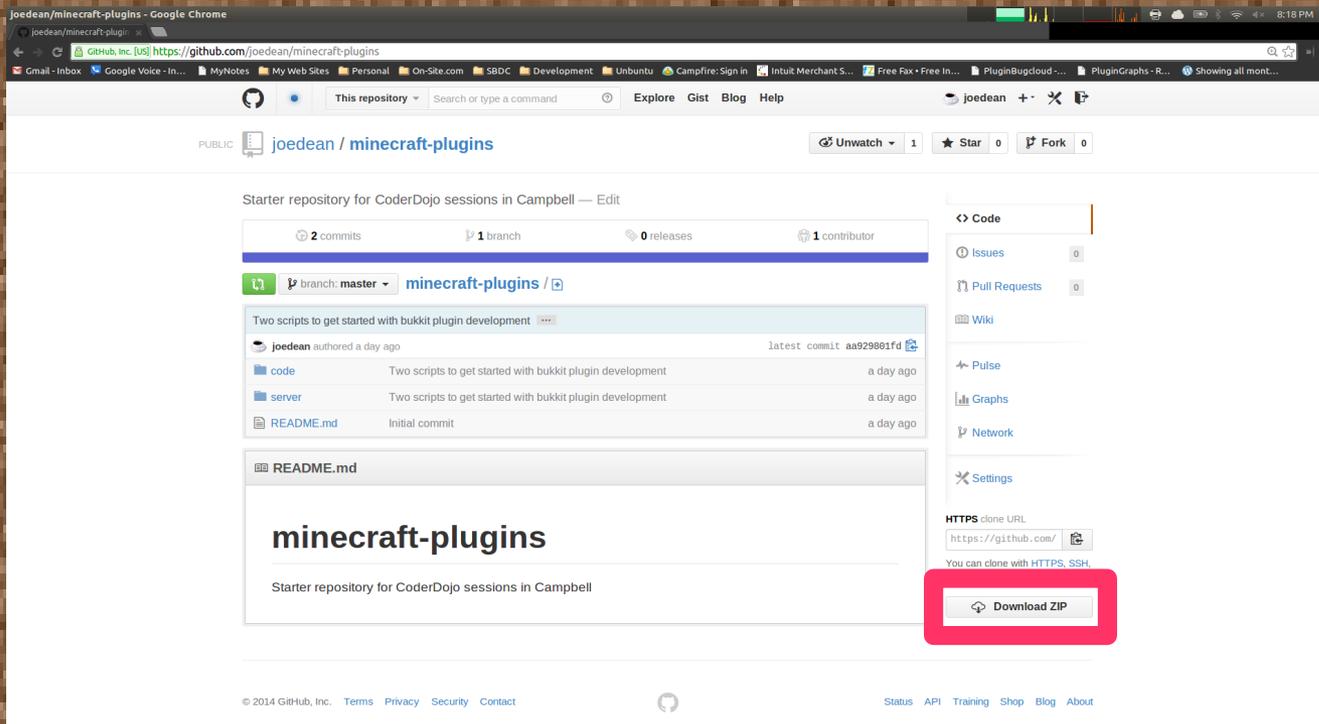
# Create Server (Option 2: Use zip)

Use “wget” on command line

```
joe@casper:~$ wget https://github.com/joedean/minecraft-plugins/archive/master.zip
```

OR

Download from web page (<https://github.com/joedean/minecraft-plugins>)



The screenshot shows a web browser displaying the GitHub repository page for 'joedean/minecraft-plugins'. The page includes the repository name, a description 'Starter repository for CoderDojo sessions in Campbell', and a table of files. A red box highlights the 'Download ZIP' button in the 'Code' section.

File	Description	Commit
code	Two scripts to get started with bukkit plugin development	a day ago
server	Two scripts to get started with bukkit plugin development	a day ago
README.md	Initial commit	a day ago



# Create Server (Option 2) – cont.

- Go to home directory

```
joe@casper:~$ cd
```

- Move downloaded zip file to home directory (if needed)

```
joe@casper:~$ mv ~/Downloads/master.zip .
```

\* Note: Your master.zip file may be in a different folder.

- Unzip master.zip file and rename directory

```
joe@casper:~$ unzip master.zip
```

```
joe@casper:~$ mv minecraft-plugins-master/ minecraft-plugins
```

- Change directory to “server”

```
joe@casper:~$ cd minecraft-plugins/server
```

- Move craftbukkit.jar file into server directory

```
joe@casper:~/minecraft-plugins/server$ mv ~/Downloads/craftbukkit.jar .
```

\* Note: Your craftbukkit.jar file may be in a different folder.

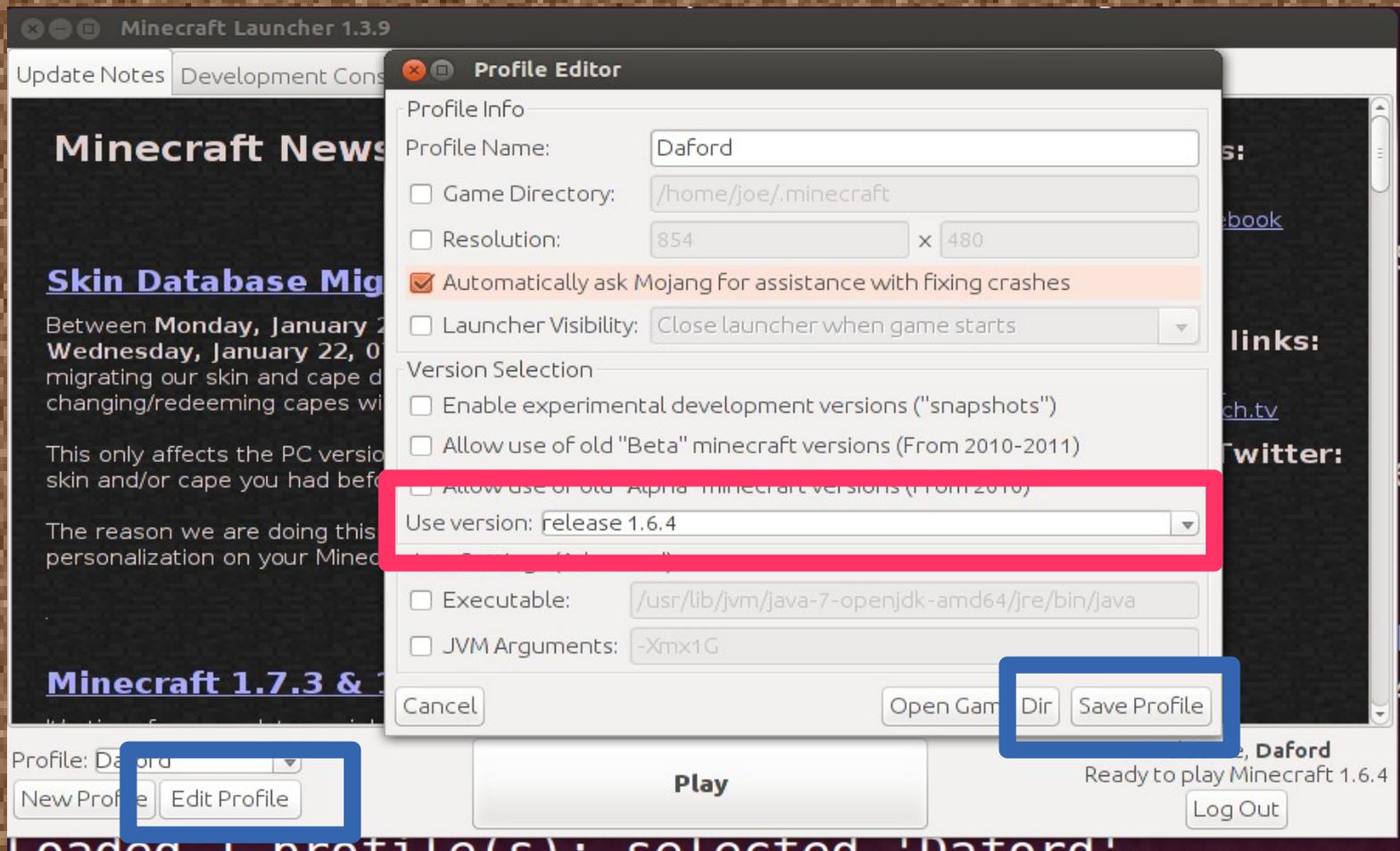
- Start server

```
joe@casper:~/minecraft-plugins/server$ ./start-minecraft-server.sh  
22:37:37 [INFO] Starting minecraft server version 1.6.4  
22:37:59 [INFO] Done (21.228s)! For help, type "help" or "?"
```



# Connect Client to Server

Set Client to use version: release 1.6.4



# Connect Client to Server – cont.

- Select Multiplayer
- Click “Add Server”
- Server Name “My Server”  
(or any name you want)
- Server Address: localhost  
(or your IP Address  
or your friends IP address)
  - Mac or Linux command line: `$ ifconfig`
  - Windows command line: `$ ipconfig`
- Select newly created server and click “Join Server”



# Server Commands

- Give op to your user (Server operator)

```
>op Daford
op Daford
23:38:45 [INFO] CONSOLE: Opped Daford
```

- Put server into creative mode for your user
  - survival = 0 (default)
  - creative = 1
  - adventure = 2

```
>gamemode 1 Daford
gamemode 1 Daford
23:43:03 [INFO] CONSOLE: Set Daford's game mode to CREATIVE mode
```

- Stop server

```
>stop
stop
23:43:25 [INFO] CONSOLE: Stopping the server..
```

- Refer to this site for more server commands  
[http://wiki.bukkit.org/CraftBukkit\\_commands](http://wiki.bukkit.org/CraftBukkit_commands)



**MINECRAFT**

# Finite State Machines

- Let's have fun with our new servers and learn about “Finite State Machines”
- Finite State Machine = An abstract machine that can be in one or a finite number of states. The Machine is in only one state at a time.
  - Current state = The state that the machine is in at any given time.
  - Transition = Changes from one state to another when initiated by a triggering event or condition.



# Finite State Machines



# Plugin Setup

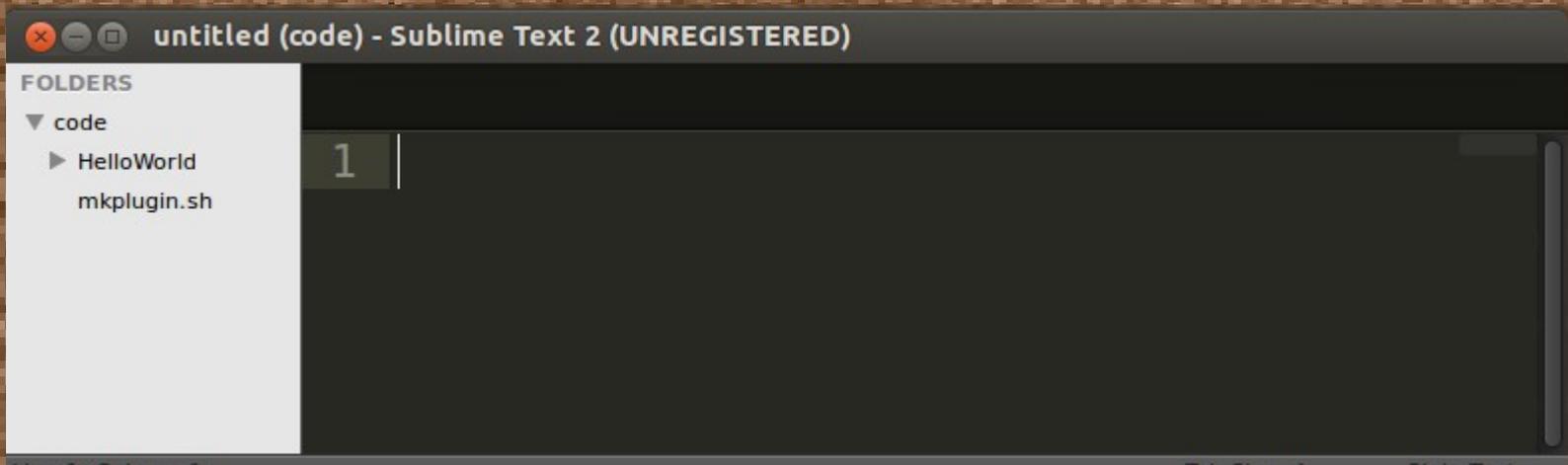
```
joe@casper:~/minecraft-plugins/code$ ./mkplugin.sh HelloWorld
joe@casper:~/minecraft-plugins/code$ ls
HelloWorld  mkplugin.sh
joe@casper:~/minecraft-plugins/code$ cd HelloWorld/
joe@casper:~/minecraft-plugins/code/HelloWorld$ ls
bin  build.sh  dist  plugin.yml  src
joe@casper:~/minecraft-plugins/code/HelloWorld$
```



# Open Sublime Text

1. Open a new terminal and change directory to ~/minecraft-server
2. Start sublime text

```
joe@casper:~$ cd minecraft-plugins  
joe@casper:~/minecraft-plugins$ sublime_text code  
joe@casper:~/minecraft-plugins$ █
```



# Creating your First Plugin

```
1 package helloworld;
2
3 import java.util.logging.Logger;
4 import org.bukkit.command.Command;
5 import org.bukkit.command.CommandSender;
6 import org.bukkit.entity.Player;
7 import org.bukkit.plugin.Plugin;
8 import org.bukkit.plugin.java.JavaPlugin;
9
10 public class HelloWorld extends JavaPlugin {
11     public static Logger log = Logger.getLogger("Minecraft");
12     public void onEnable() {
13         log.info("[HelloWorld] Start up.");
14     }
15     public void onReload() {
16         log.info("[HelloWorld] Server reloaded.");
17     }
18     public void onDisable() {
19         log.info("[HelloWorld] Server stopping.");
20     }
21
22     public boolean onCommand(CommandSender sender, Command command,
23                             String commandLabel, String[] args) {
24         if (commandLabel.equalsIgnoreCase("helloworld")) {
25             if (sender instanceof Player) {
26                 Player me = (Player)sender;
27                 // Put your code after this line:
28
29                 // ...and finish your code before this line.
30                 return true;
31             }
32         }
33         return false;
34     }
35 }
```

Create package

Imports Classes

Create class

Initialize Logger

Implement onEnable

Implement onReload

Implement onDisabled

Implement onCommand

Validate command label

Add custom code

Return boolean val





# HelloWorld



```
22 public boolean onCommand(CommandSender sender, Command command,
23                          String commandLabel, String[] args) {
24     if (commandLabel.equalsIgnoreCase("helloworld")) {
25         if (sender instanceof Player) {
26             Player me = (Player)sender;
27             // Put your code after this line:
28             String msg = "Hello there! Let's get ready to code some plugins! ";
29             sender.getServer().broadcastMessage(msg);
30             // ...and finish your code before this line.
31             return true;
32         }
33     }
34     return false;
35 }
```



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# Plugin.yml

```
1 name: HelloWorld
2
3 author: Joe Dean
4
5 main: helloworld.HelloWorld
6
7 commands:
8   helloworld:
9     description: Simple hello world app. Type "helloworld" at minecraft command prompt and see custom message.
10  helloworld_admin:
11    description: Type "helloworld" and see a message.
12
13 version: 0.1
14
```



# Build and Reload Plugin

## Build plugin

```
joe@casper:~/minecraft-plugins/code/HelloWorld$ pwd
pwd
/home/joe/minecraft-plugins/code/HelloWorld
joe@casper:~/minecraft-plugins/code/HelloWorld$ ./build.sh
./build.sh
Compiling with javac...
warning: [options] bootstrap class path not set in conjunction with -source 1.6
1 warning
Creating jar file...
Deploying jar to /home/joe/minecraft-plugins/server/plugins...
Completed Successfully.
joe@casper:~/minecraft-plugins/code/HelloWorld$
```

## Reload server

```
>reload
01:48:39 [INFO] [HelloWorld] Disabling HelloWorld v0.1
01:48:39 [INFO] [HelloWorld] Server stopping.
01:48:39 [INFO] [HelloWorld] Loading HelloWorld v0.1
01:48:39 [INFO] [HelloWorld] Enabling HelloWorld v0.1
01:48:39 [INFO] [HelloWorld] Start up.
01:48:39 [INFO] Server permissions file permissions.yml is empty, ignoring it
01:48:39 [INFO] CONSOLE: Reload complete.
```



# Test Plugin



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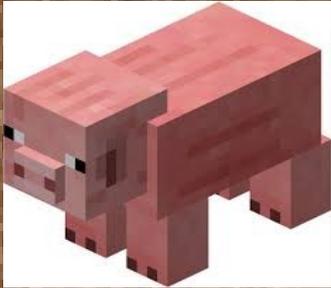
# Cowabunga



```
1 package cowabunga;
2
3 import java.util.logging.Logger;
4 import org.bukkit.Location;
5 import org.bukkit.command.Command;
6 import org.bukkit.command.CommandSender;
7 import org.bukkit.entity.Player;
8 import org.bukkit.entity.Cow;
9 import org.bukkit.plugin.Plugin;
10 import org.bukkit.plugin.java.JavaPlugin;
11
12 public class Cowabunga extends JavaPlugin {
13     public static Logger log = Logger.getLogger("Minecraft");
14     public void onEnable() {
15         log.info("[Cowabunga] Start up.");
16     }
17     public void onReload() {
18         log.info("[Cowabunga] Server reloaded.");
19     }
20     public void onDisable() {
21         log.info("[Cowabunga] Server stopping.");
22     }
23
24     public boolean onCommand(CommandSender sender, Command command,
25                             String commandLabel, String[] args) {
26         if (commandLabel.equalsIgnoreCase("cowabunga")) {
27             if (sender instanceof Player) {
28                 Player me = (Player)sender;
29                 // Put your code after this line:
30                 Location location = me.getLocation();
31                 for (int i = 0; i < 10 ; i++) {
32                     me.getWorld().spawn(location, Cow.class);
33                 }
34                 // ...and finish your code before this line.
35                 return true;
36             }
37         }
38         return false;
39     }
40 }
```



# When Pigs Fly



```
1 package pigsfly;
2
3 import java.util.logging.Logger;
4 import org.bukkit.Location;
5 import org.bukkit.command.Command;
6 import org.bukkit.command.CommandSender;
7 import org.bukkit.entity.Player;
8 import org.bukkit.entity.Bat;
9 import org.bukkit.entity.Pig;
10 import org.bukkit.plugin.Plugin;
11 import org.bukkit.plugin.java.JavaPlugin;
12 import org.bukkit.potion.PotionEffect;
13 import org.bukkit.potion.PotionEffectType;
14
15 public class PigsFly extends JavaPlugin {
16     public static Logger log = Logger.getLogger("Minecraft");
17     public void onEnable() {
18         log.info("[PigsFly] Start up.");
19     }
20     public void onReload() {
21         log.info("[PigsFly] Server reloaded.");
22     }
23     public void onDisable() {
24         log.info("[PigsFly] Server stopping.");
25     }
26
27     public boolean onCommand(CommandSender sender, Command command,
28                             String commandLabel, String[] args) {
29         if (commandLabel.equalsIgnoreCase("pigsfly")) {
30             if (sender instanceof Player) {
31                 Player me = (Player)sender;
32                 // Put your code after this line:
33                 Location location = me.getLocation();
34                 location.setY(location.getY() + 5);
35                 Bat bat = me.getWorld().spawn(location, Bat.class);
36                 Pig pig = me.getWorld().spawn(location, Pig.class);
37                 bat.setPassenger(pig);
38                 PotionEffect potion = new PotionEffect(
39                                     PotionEffectType.INVISIBLE,
40                                     Integer.MAX_VALUE,
41                                     1);
42                 bat.addPotionEffect(potion);
43                 // ...and finish your code before this line.
44                 return true;
45             }
46         }
47         return false;
48     }
49 }
```



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# Create your own!

- Have fun creating your own plugin using the “onCommand” method.
- Refer to the documentation for more ideas
  - <http://jd.bukkit.org/rb/apidocs/>
  - <http://jd.bukkit.org/rb/doxygen/>



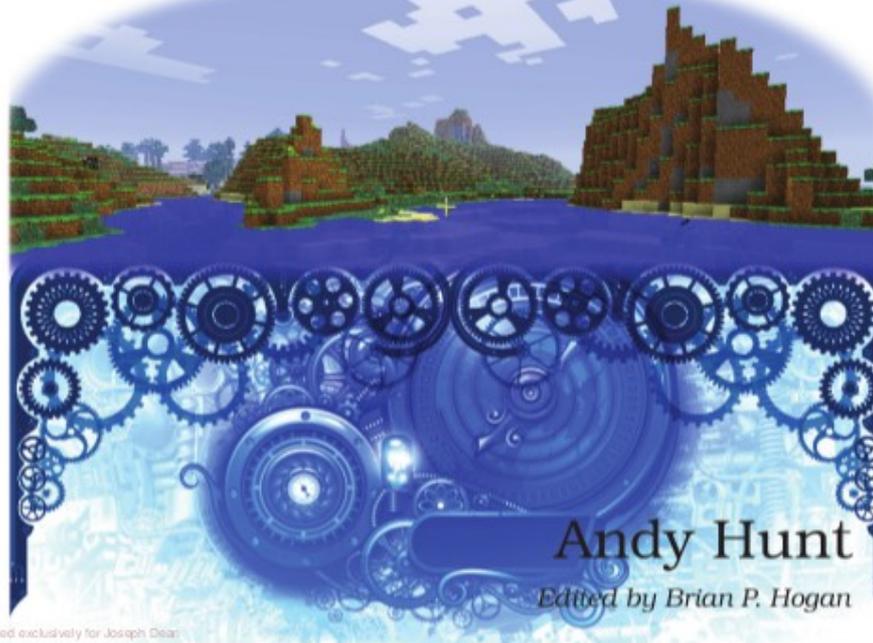
# Show and Tell



The  
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Create Flying Creepers  
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Prepared exclusively for Joseph Dear

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