

# **Minecraft in Geography**

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**By Paul Blankenship, NBCT**

# Purpose

- The purpose of this presentation is to introduce teachers to MinecraftEdu, Spritecraft, and MCEdit as tools to build maps. If you have your computer or other device feel free to bookmark the sites we discuss. I will be available after the session to help guide you as you install the software on your computer.
- I will not have time in this presentation to sell you on the value of games in education. If you are here you probably already realize the potential of these tools. If not, please see my blog, <http://paulblankenship.com> for more information and links to TedTalks videos on the subject.
- I did not create any of this software. I just found ways to use these programs in geography and civics.

# What is Minecraft?

- Minecraft is a three-dimensional virtual sandbox.
- Users build using blocks of different materials.

# Minecraft is not...

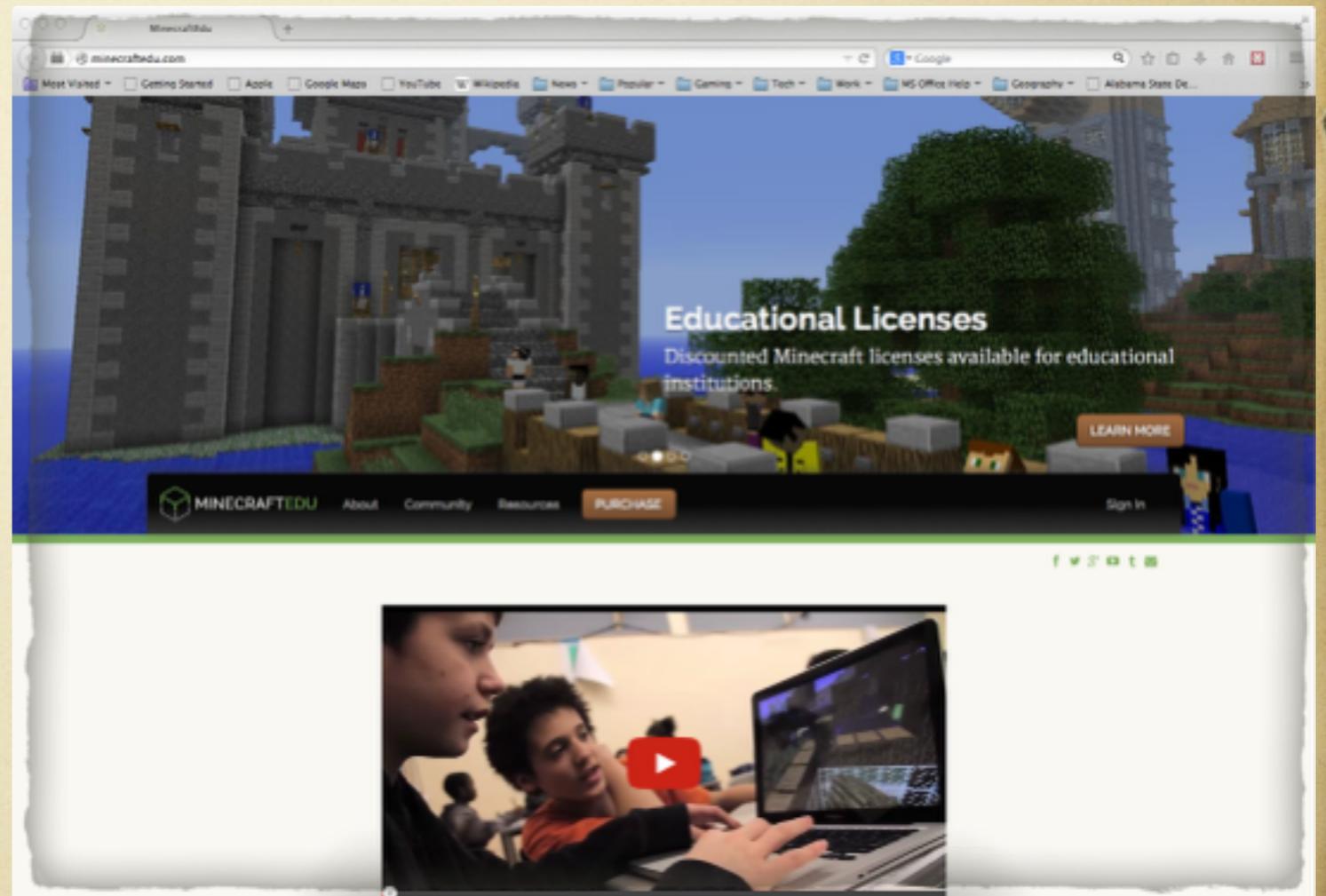
- A game in the traditional sense
- The user sets the goals
- Winning and losing do not apply

# Popular

- Minecraft is among the most popular video games (inasmuch as it is a game) in the market today.
- Over 16 million copies for computers have sold.
- Over 21 million copies for mobile devices sold.
- Minecraft may be played on Mac OSX, Windows, Linux, xBox, Playstation, iOS, Android, and Raspberry Pi.

# MinecraftEdu

- Educators quickly recognized the potential of Minecraft in the classroom.
- Joel Levin, a New York teacher, developed the MinecraftEdu edition to improve the educational value of the software.



# Why use MinecraftEdu?

- Why choose MinecraftEdu over regular Minecraft?
- The educational discount cuts the price in half if a school buys in bulk.
- The teacher has much more control. Teacher powers include freezing students (individually or as a group), moving students, giving students resources, and muting the in-game chat.

# Why use MinecraftEdu?

- MinecraftEdu works in highly filtered and restricted networks, typical of schools.
- Regular Minecraft eventually stops working in heavily filtered network environments.
- Learn from my mistakes. Use MinecraftEdu from the start.

# Maps in Minecraft

- Several students constructed and presented historical Louisiana buildings such as plantations and the state capitol.
- For several years I assigned a project called the “Art Map of Louisiana.” The project involved making a large foam-board map of the states incorporating different objects and textures.
- Some students in my Minecraft Club asked to do the Art Map Project in Minecraft rather than on the boards. I agreed and the results were amazing.



# Purchasing MinecraftEdu

- 1. Go to <http://minecrafteu.net>
- 2. Click the button to go to the purchase page. Buy one server for each classroom or lab. Buy enough client (student program) licenses so that each student using a computer (MinecraftEdu does not run on mobile devices) at a given time will have his or her own client. Sharing is not much fun.

# Purchasing MinecraftEdu

- 3. Create an account for your school.
- 4. Pay. Purchase orders are accepted.
- 5. Check your email for the links and codes needed to download the software. Don't expect physical copies.
- 6. Follow the directions provided to install the software.

# Making the Outline Map

- I knew that creating a scale map of Louisiana in Minecraft would be too time consuming, so I made the outline map of the state with the parishes for the students and shared it via DropBox.
- Students could do this part with the directions I am sharing with you.



# Disclaimers

- While I have not had any problems with the software I discuss, I cannot promise you that you will have the same positive experience. The Internet is a risky place.
- Have all your computer security programs updated and running. Make sure Java is up to date. Ask a professional for help if needed.
- Only download from the official sites. Malware distributors often take a legitimate program, add malware, and then distribute through third-party web sites. Don't just "Google it" and select the first thing you see.
- Even official sites could get hacked (just ask Target, the FBI, or the U.S. Senate). To browse a site is to download files from the site. Always take reasonable precautions and have backup files. You have backup automatically running, right?
- Proceed at your own risk.

# Find a Map

- First, find an outline map of the area. There are many sources for public domain maps on the Internet, such as Wikipedia. You could scan a paper map.
- Edges should be thick and dark. Thin edges may not show up at the end of the process.
- The format must be .jpg, .png, or .bmp. Files in the .gif or .pdf formats must be converted to .jpg, .png, or .bmp.

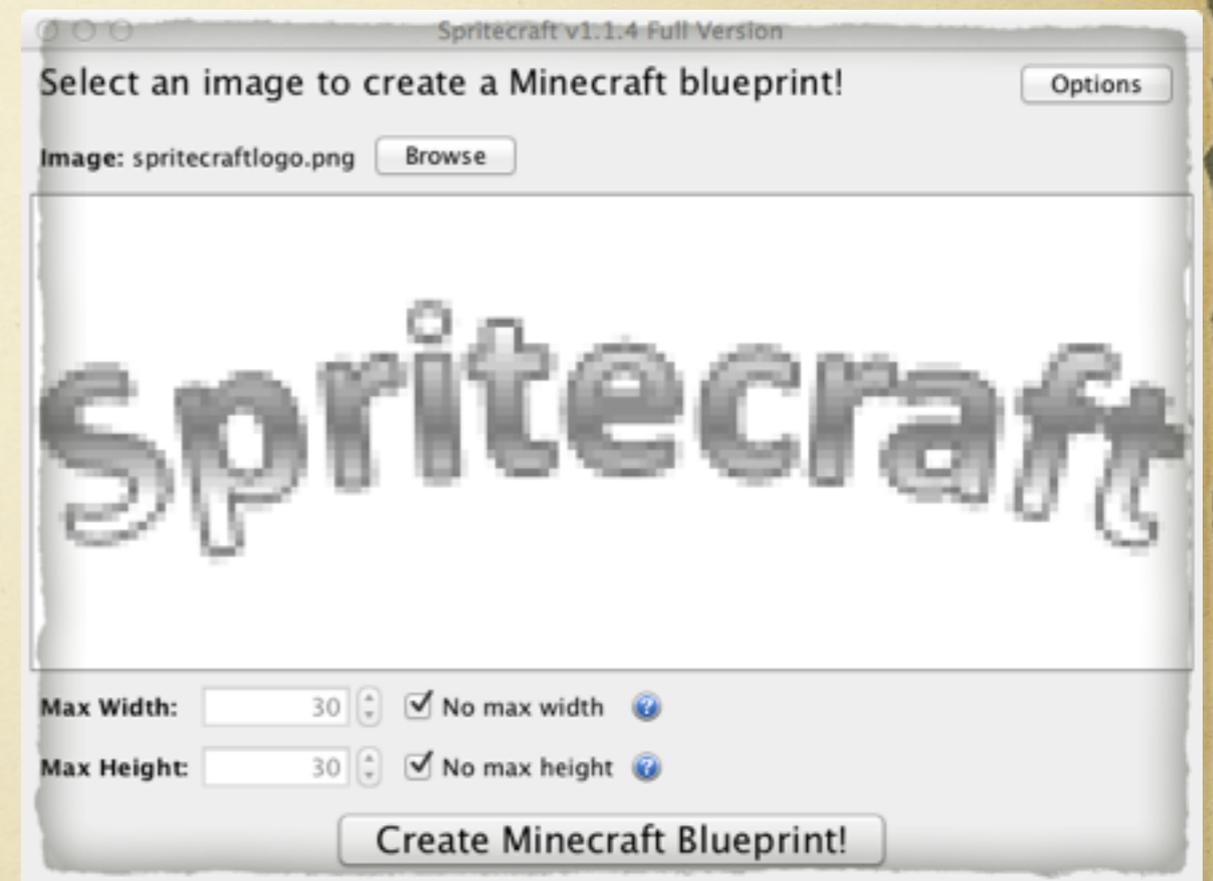
# Install Spritecraft



- Spritecraft (<http://www.diamondpants.com/spritecraft/>) is software that renders a graphics file, such as your map, into Minecraft blocks in what is called a schematic.
- Download and install the full version. The limited version is useless for our purpose.

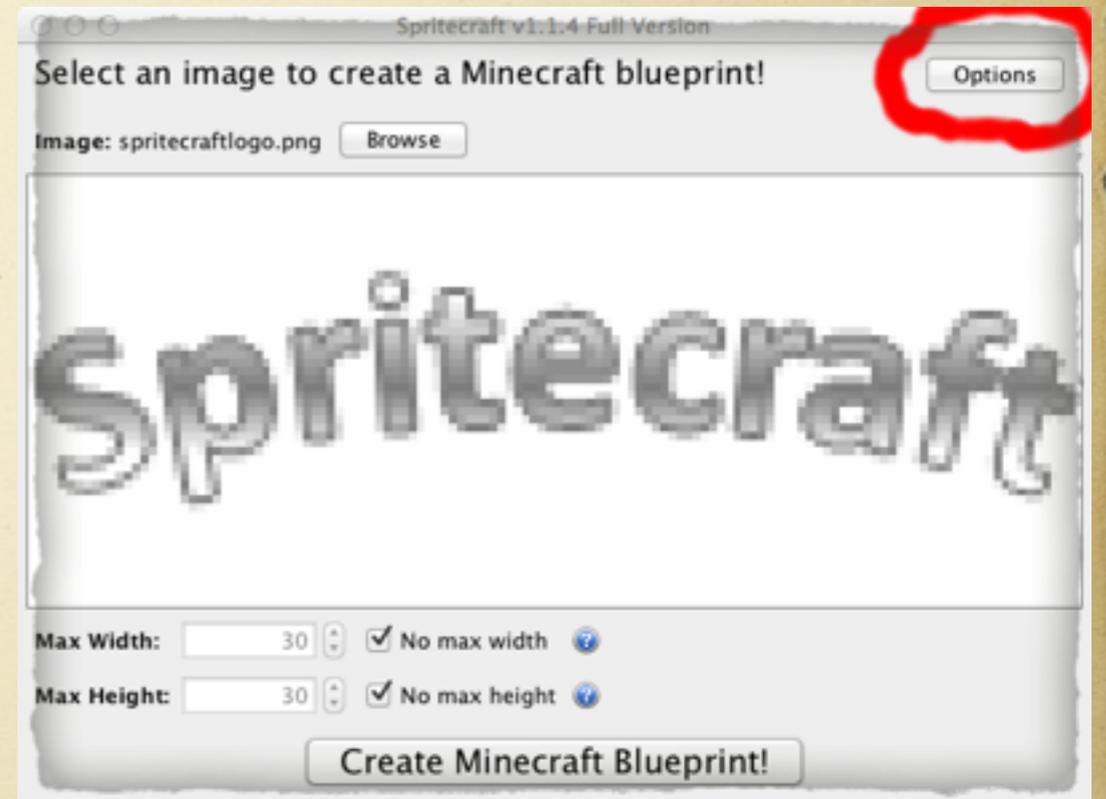
# Convert the Map into a Schematic

- Open Spritecraft (see the following slide for special information about doing this on a Mac).
- YouTube has a tutorial on using Spritecraft.
- An alternative for Windows and Linux is Image to Map.



# Setting Spritecraft Options

- In Spritecraft (as of version 1.1.4) click the OPTIONS button in the upper right hand corner of the program window.



# Setting Spritecraft Options

- You may leave most option on default, except for SIDE OR TOP VIEW.
- Important: Switch the SIDE OR TOP VIEW setting to TOP VIEW. Otherwise your map will render sideways and go too far up to be used.
- You may uncheck any types of blocks that you do not want in the map. This decision is usually made on a trial-and-error basis for each map.
- Click CLOSE in the lower right corner when you are done changing the options.



Options

Resource Pack: Default

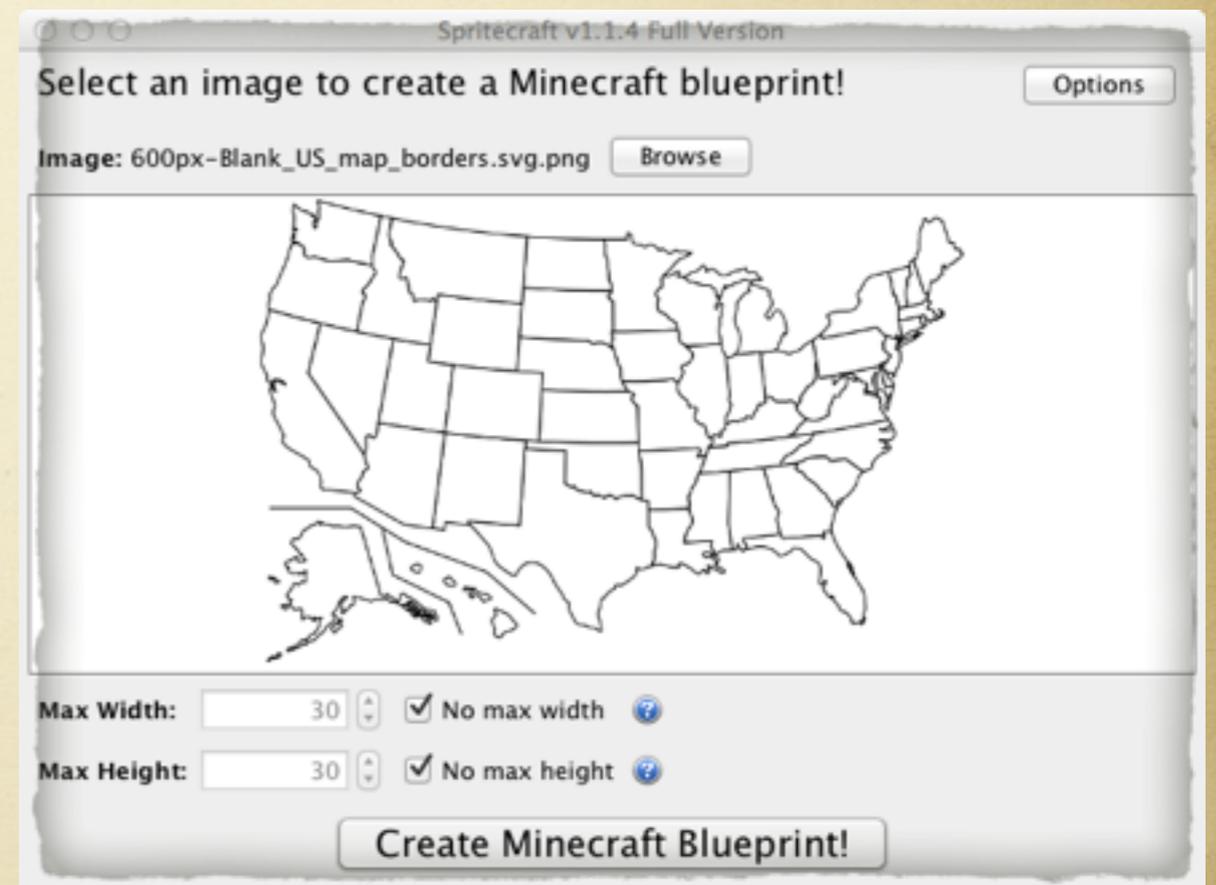
Side or Top View:  Side View  Top View

Dither:

- Blocks
- Common
  - Birch Wood Plank
  - Cobblestone
  - Dirt
  - Gravel
  - Hieroglyphic Sandstone
  - Jungle Wood Plank
  - Netherrack
  - Pine Wood Plank
  - Sand
  - Sandstone
  - Smooth Sandstone
  - Stone
  - Stone Brick
  - Stone Slab
  - Wood
  - Wood Plank
- Rare
  - Birch Wood
  - Bricks
  - Chiseled Quartz
  - Chiseled Stone Brick
  - Cracked Stone Brick
  - Diamond
  - Emerald
  - End Stone
  - Gold
  - Iron
  - Jungle Wood
  - Lapis Lazuli Block
  - Moss Stone
  - Mossy Stone Brick
  - Nether Bricks
  - Obsidian
  - Quartz
  - Quartz Pillar
  - Red Wood
  - Snow
- Wool
  - Black Wool
  - Blue Wool
  - Brown Wool
  - Cyan Wool
  - Green Wool
  - Gray Wool
  - Light Blue Wool
  - Light Gray Wool
  - Lime Wool
  - Magenta Wool
  - Orange Wool
  - Pink Wool
  - Purple Wool
  - Red Wool
  - Wool
  - Yellow Wool
- Clay
  - Black Clay
  - Blue Clay
  - Brown Clay
  - Clay Block
  - Cyan Clay
  - Green Clay
  - Gray Clay
  - Hardened Clay
  - Light Blue Clay
  - Lime Clay
  - Magenta Clay
  - Orange Clay
  - Pink Clay
  - Purple Clay
  - Red Clay
  - Silver Clay
  - White Clay
  - Yellow Clay
- Unusual
  - Bookshelf
  - Coal Block
  - Crafting Table
  - Glowstone Block
  - Gold Ore
  - Hay
  - Iron Ore
  - Jukebox
  - Melon
  - Nether Quartz Ore
  - Note Block
  - Pumpkin
  - Redstone Block
  - Soul Sand
  - TNT
- Special
  - Bedrock
  - Coal Ore
  - Diamond Ore
  - Emerald Ore
  - Lapis Lazuli Ore
  - Redstone Ore
  - Sponge

# Opening the Map in Spritecraft

- On the main program window
  - Click BROWSE (upper left side)
  - Select the map file (if it is gray you must convert the file to a supported format or use a different map). Your map should replace the word “Spritecraft” in the window.
  - Click CREATE MINECRAFT BLUEPRINT!
  - Patiently wait if the file is large or your computer is small. It may seem frozen for a few minutes.
  - Click SAVE SCHEMATIC.
  - Select the location you want to save the schematic.
  - Enter a file name next to the word SAVE AS.



# Spritecraft on Mac OSX

➤ On a Mac, you may have to go into System Preferences > Security & Privacy to allow the program to run the first time you use it.



# Mac, Spritecraft, and Java

- You may have to go to [http://java.com/en/download/faq/java\\_mac.xml](http://java.com/en/download/faq/java_mac.xml) and update Java.
- Updating Java to 64 bit will make it incompatible with Google Chrome. Switch to Firefox as your default browser if possible. If you must use Google Chrome with Java you will need to use Spritecraft on Windows or Linux.



# Install MCEdit

- The next program required is MCEdit (as in Minecraft Editor). There are other similar programs, so if you dislike MCEdit you may want to try something else.
- Go to <http://www.mcedit.net/> and select your operating system (Mac, Windows, or Linux).
- Follow the directions on the page to install. I recommend that you avoid the development build unless you are very tech savvy.

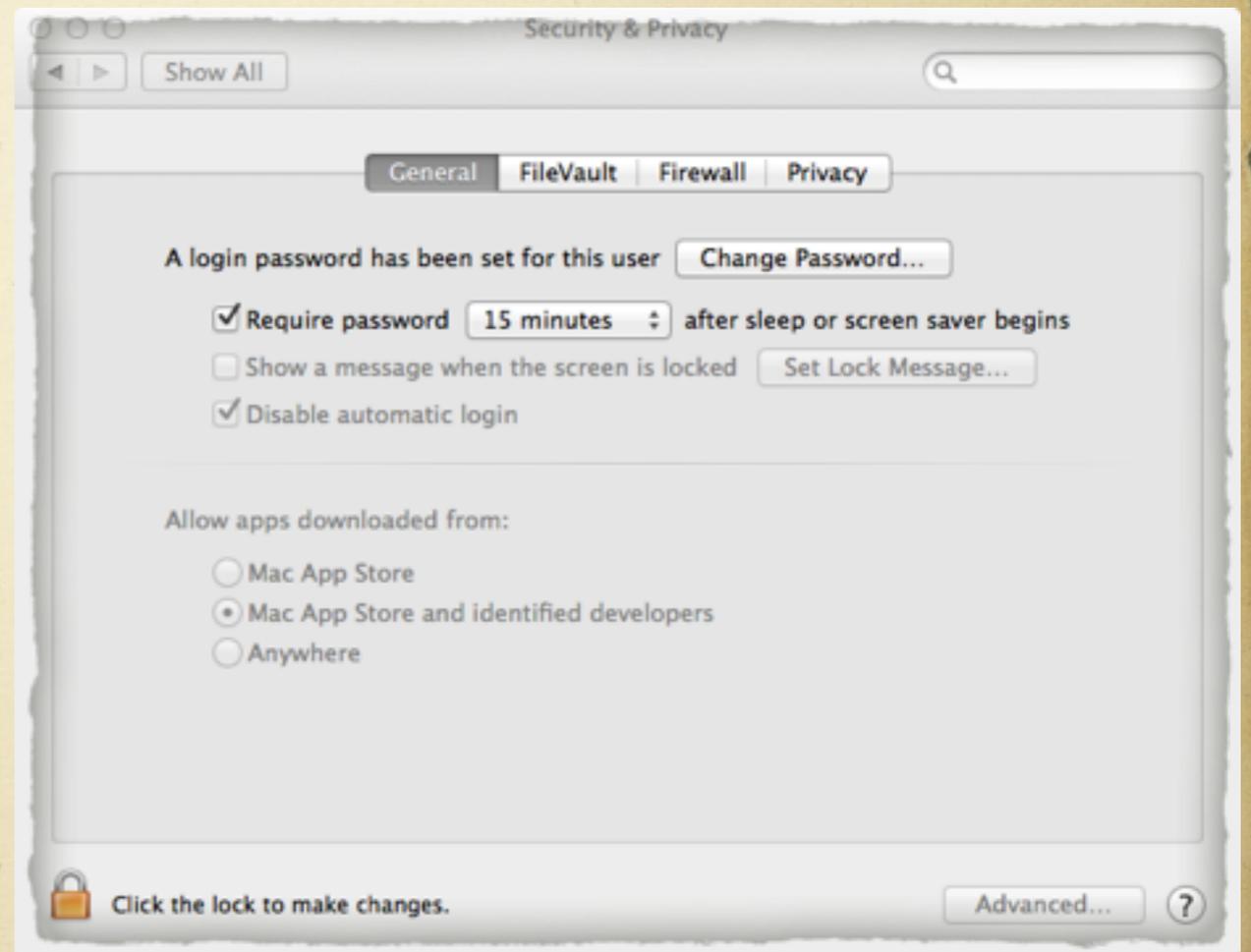


# Open MCEdit

- Locate the downloaded file. Check your “Downloads” folder.
- Unzip the file (double-clicking will probably do this on your computer).
- Double-click on the program.

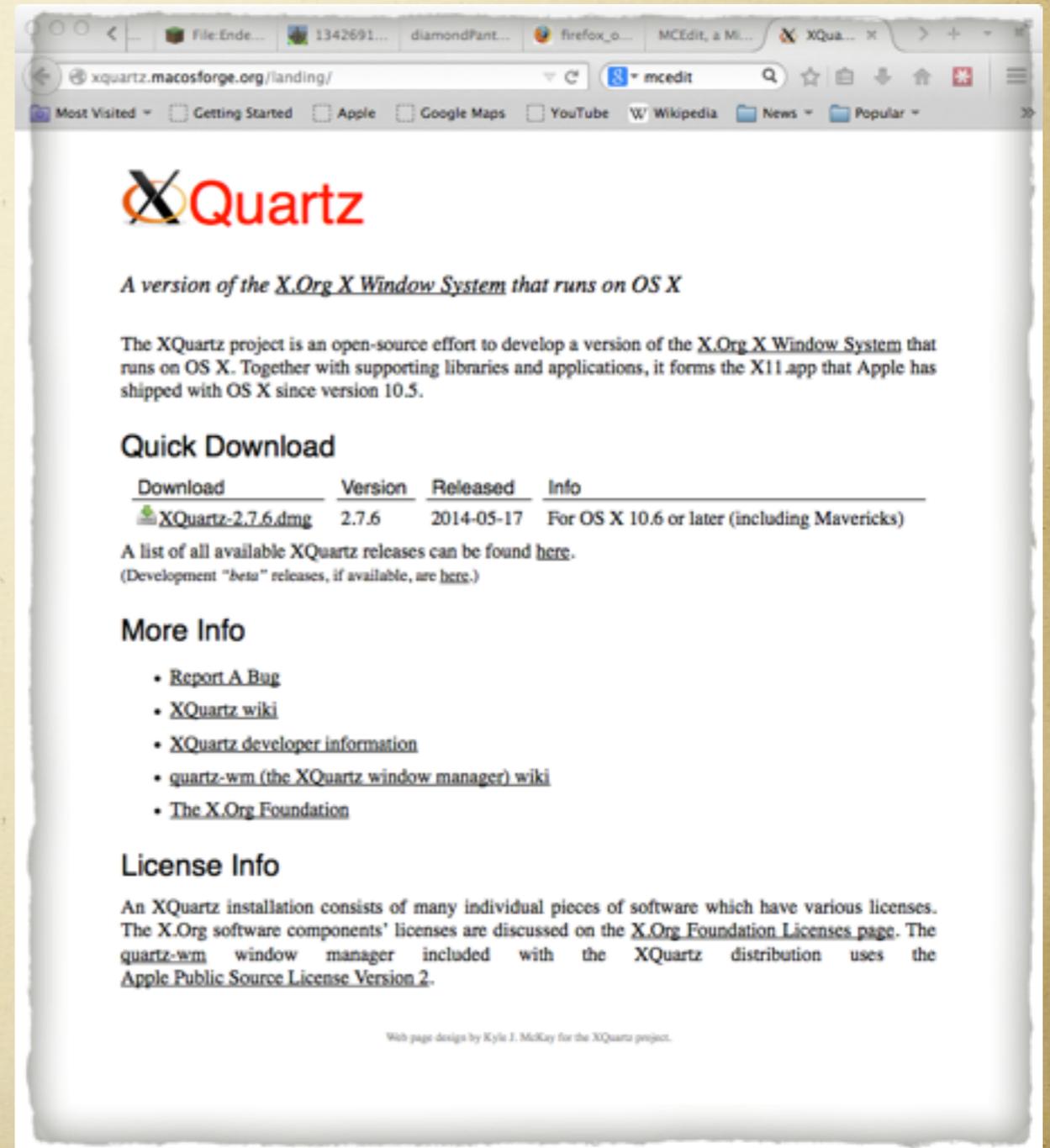
# MCEdit on a Mac

- On a Mac, you may need to go into System Preferences > Security & Privacy and click **OPEN ANYWAY** to permit the program to run.



# XQuartz on the Mac

- After that you may get a request to install X11. Click CONTINUE. Click the link on the page that pops up to install Xquartz. Click the link under QUICK DOWNLOAD for the latest version. Click OK on the next dialogue box. The download might take some time.



The screenshot shows a web browser window with the address bar displaying `xquartz.macosforge.org/landing/`. The page content includes the XQuartz logo, a description of the project as a version of the X.Org X Window System for OS X, and a 'Quick Download' section with a table of releases. The table lists a download for version 2.7.6, released on 2014-05-17, for OS X 10.6 or later. Below the table, there are links for 'More Info' and 'License Info'.

**XQuartz**

*A version of the X.Org X Window System that runs on OS X*

The XQuartz project is an open-source effort to develop a version of the X.Org X Window System that runs on OS X. Together with supporting libraries and applications, it forms the X11.app that Apple has shipped with OS X since version 10.5.

**Quick Download**

Download	Version	Released	Info
<a href="#">XQuartz-2.7.6.dmg</a>	2.7.6	2014-05-17	For OS X 10.6 or later (including Mavericks)

A list of all available XQuartz releases can be found [here](#).  
(Development "beta" releases, if available, are [here](#).)

**More Info**

- [Report A Bug](#)
- [XQuartz wiki](#)
- [XQuartz developer information](#)
- [quartz-wm \(the XQuartz window manager\) wiki](#)
- [The X.Org Foundation](#)

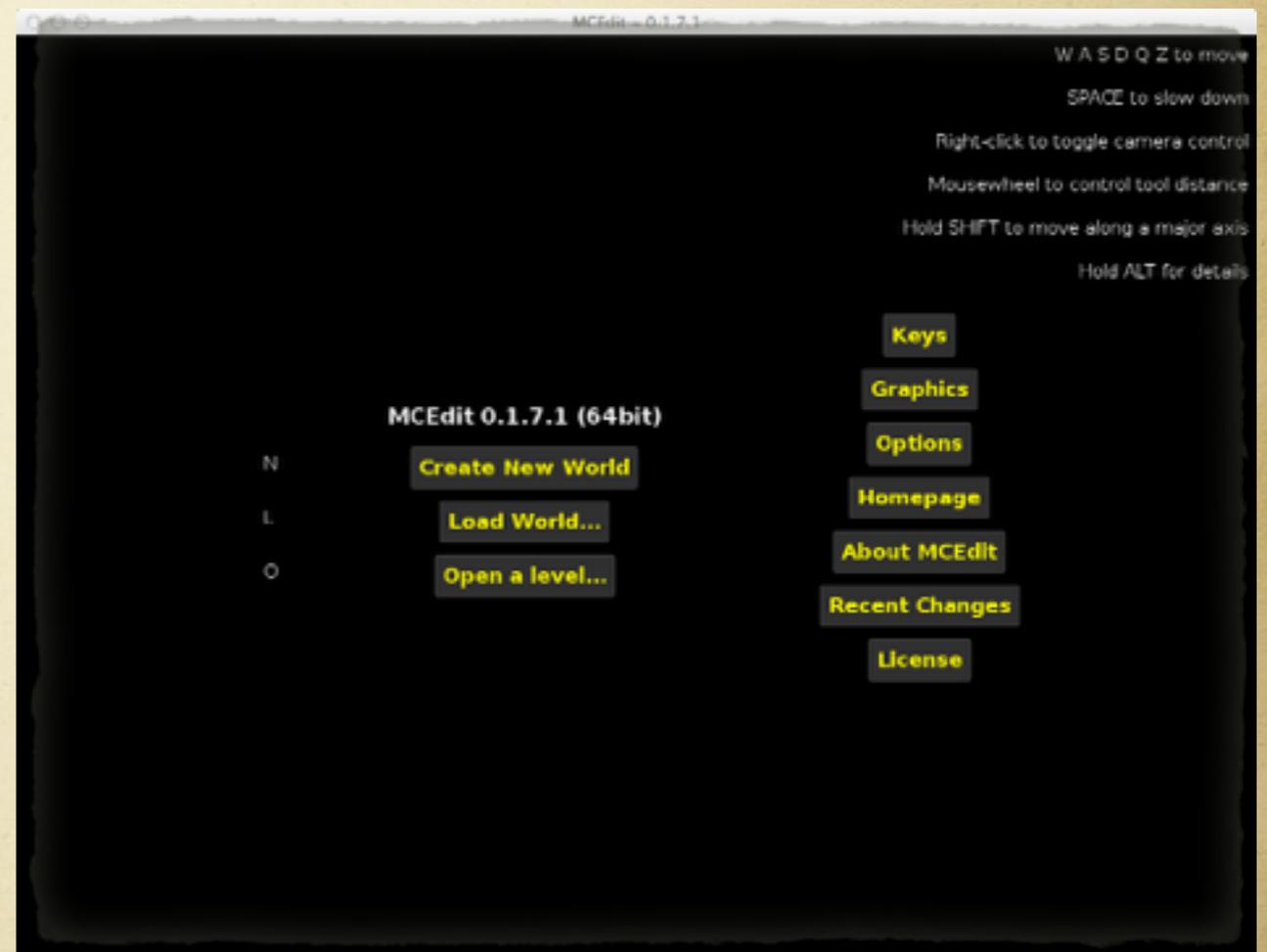
**License Info**

An XQuartz installation consists of many individual pieces of software which have various licenses. The X.Org software components' licenses are discussed on the [X.Org Foundation Licenses page](#). The quartz-wm window manager included with the XQuartz distribution uses the [Apple Public Source License Version 2](#).

Web page design by Kyle J. McKay for the XQuartz project.

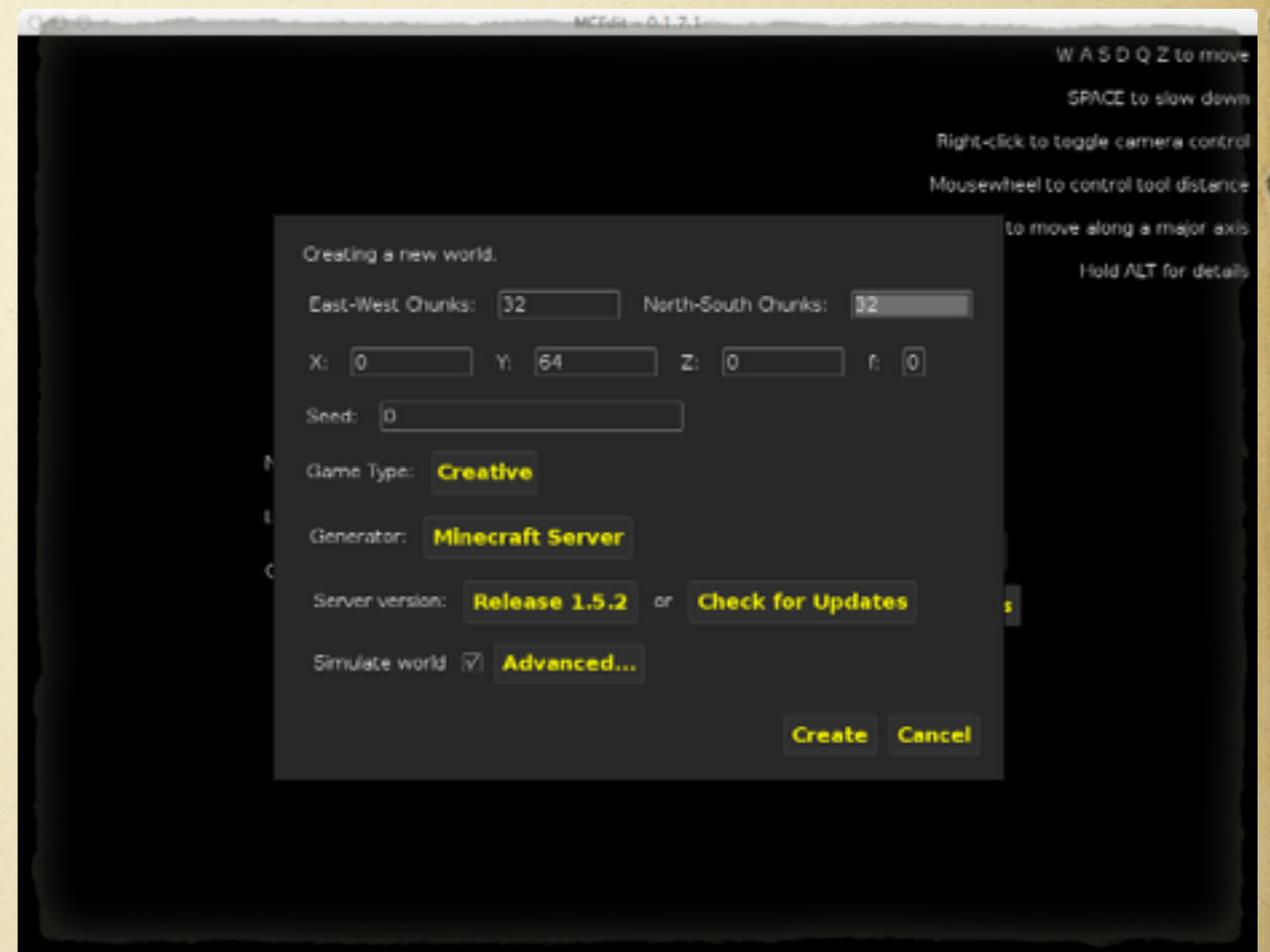
# Setting Up the World

- Read and click through the initial notifications.
- Click **CREATE NEW WORLD**.



# Setting Up the World

- Setting the number of east-west/north-south chunks depends on the size of the map you intend to make. This may require some trial-and-error. Start with 32 by 32 and work from there.
- Set game type to CREATIVE.
- Set generator to either option.
- Check SIMULATE WORLD
- Click CREATE.
- Name the world. For example, “USA1 Map.”
- Click SAVE.

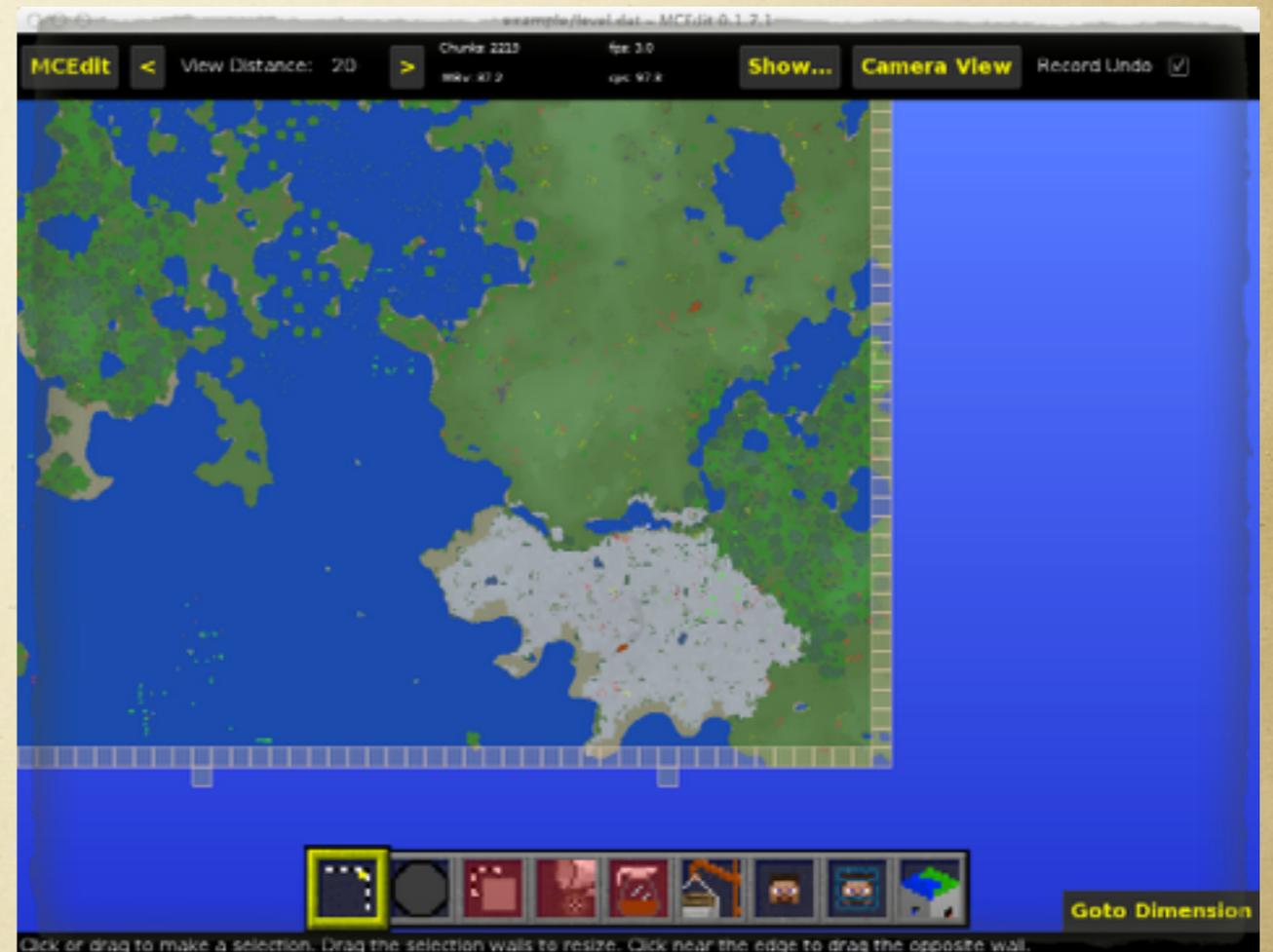


# Your Map

- The map will grow as you move through it in Minecraft. You will not run off the edge of the world.
- Click OK after reading the information about expanding the world.

# Importing the Schematic

- Look for an icon of a crane (six from the left at the bottom). Click the crane to import the schematic.
- Navigate to the schematic file you created in Spritecraft. Click OPEN.
- Switch to CHUNK VIEW.
- Click IMPORT. Wait. Click ROTATE twice to get the schematic right-side up. Hold down Q and shift while pressing NUDGE to get the map above the surface of the world. Save (cmd-s on Mac, cntrl-S on PC).



# The Tricky Part

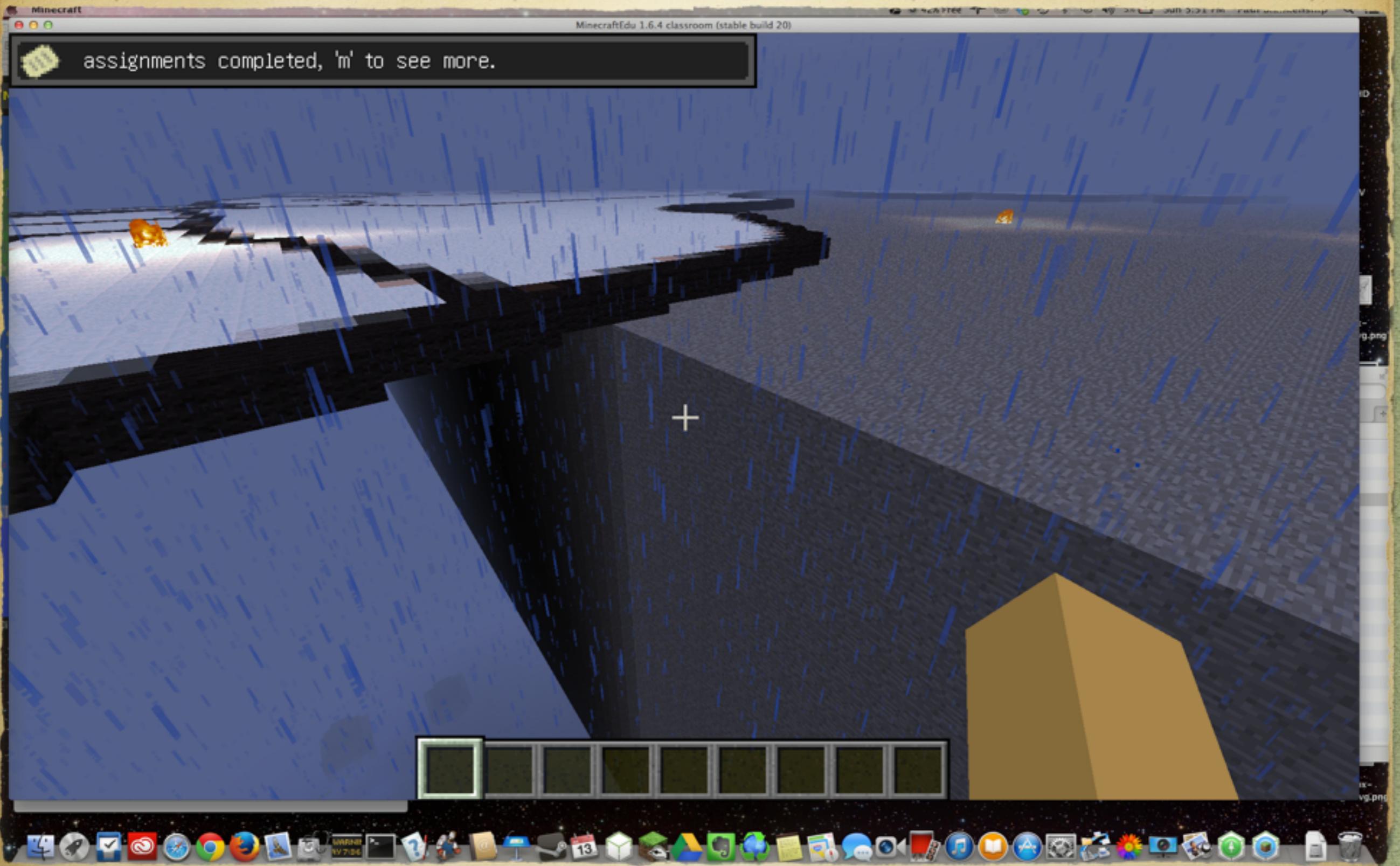
- Explaining how to select the area under the map is difficult. It takes practice and patience. A good mouse or trackball is very helpful. Flatlands are easier to use but less interesting.
- You may have to do this a section at a time.
- As you select areas, click FILL AND REPLACE, the fourth button on the bottom row from the left. Choose REPLACE. Choose AIR on the long list and set the replace option on the left as stone. Click REPLACE, not SWAP.

# Putting a Base Under the Map

- Click DESELECT.
- Click CAMERA VIEW. You will see that your map is only one block thick. If you plan to add waterways you need more depth.
- To navigate:
  - Q = up
  - Z = down
  - W = forward
  - S = reverse
  - A = slide left
  - D = slide right

# Why Elevated?

- I prefer to put the schematic high above the map.
- I then place several layers of stone below the map to prevent players from accidentally digging through the map and falling into oblivion.
- This also separates the work area from the rest of the map.
- If you place the map above the land you may select a regular map instead of a flat map and use the lower level for survival or adventure games.



# Finishing Touches

- Click DESELECT.
- SAVE. Wait.
- Click MCEDIT.
- Click WORLD INFO.
- Click REPAIR REGIONS.
- SAVE again.
- Quit MCEdit. This is important.

# Corrupted Chunks

- If you get a error message about “corrupted chunks” when you open a map in Minecraft or MinecraftEdu go back into MCEdit and repair the world.
- Open the file, click on the MCEdit button in the upper left corner, and select **WORLD INFO**. Click **REPAIR REGIONS**.

# Moving the Files

- MCEdit, by default, stores your world in the regular Minecraft folder.
- Locate your Minecraft saves folder (or wherever you had MCEdit put the save file).
- Locate your MinecraftEdu server saves folder. You can do this in the server software (look at the top of the window).
- Drag the world you made from the Minecraft folder to the MinecraftEdu server folder.
- I recommend making aliases/shortcuts for these folders on your desktop.

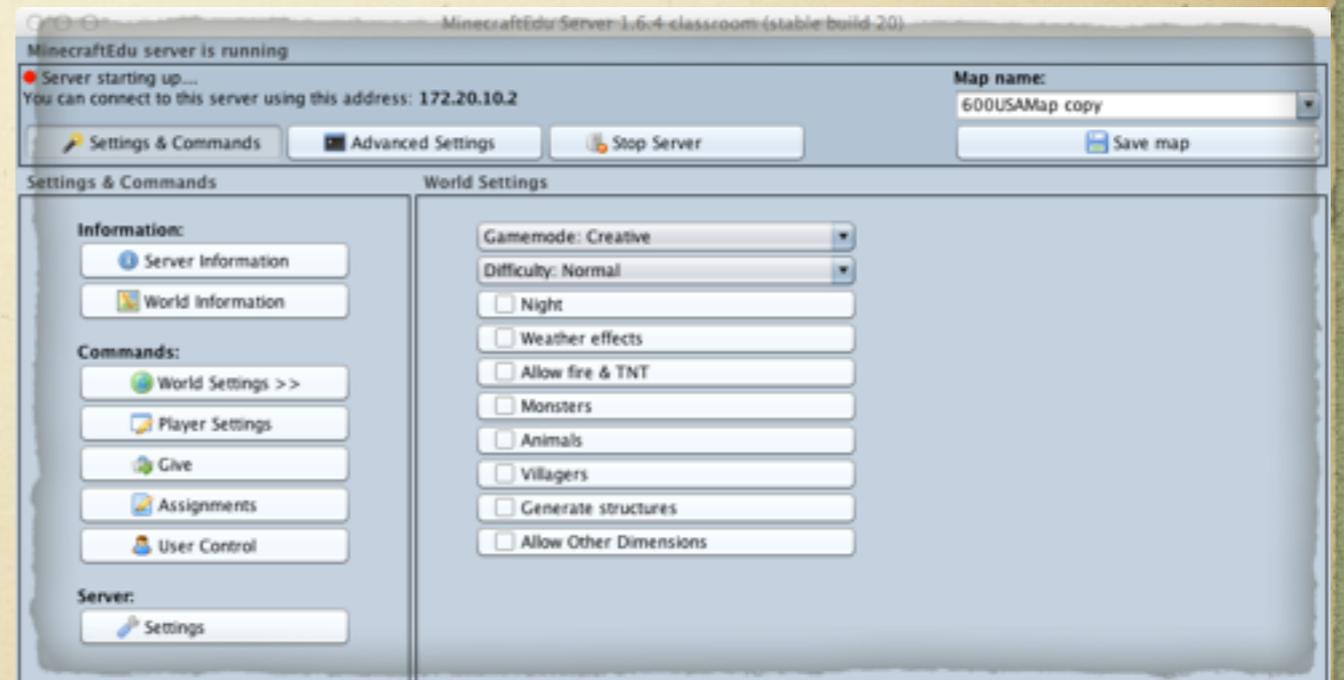
# Launching the Server

- Open the MinecraftEdu launcher.
- Click **START MINECRAFTEDU SERVER LAUNCHER**.
- Click **RESTORE LAUNCHER**.
- Click **SELECT SAVED WORLD**.
- Select the world you want to use.
- Click **START SERVER WITH SELECTED SAVED WORLD** at the bottom of the window.
- If possible, run the server on a computer that is not needed for a person.



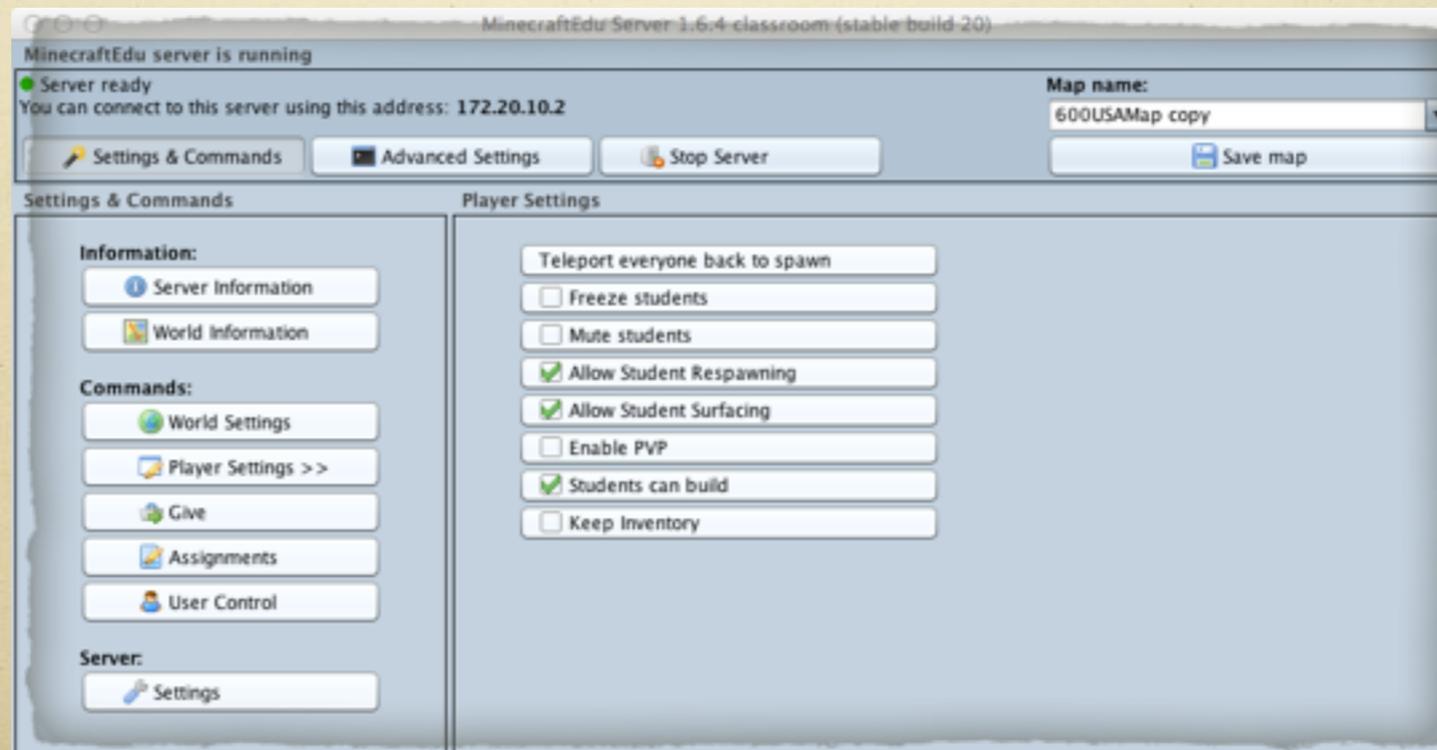
# Server Settings

- World Settings
- Gamemode: Creative
- Uncheck ALL boxes.



# Server Settings

- Player Settings
  - Check only respawning, building, and surfacing.
- Set assignment description.
- User control: allow alias protection.



# Launching the Clients

- The students use the client program.
- I recommend keeping each server to around 15 users if possible. I have run 30 at a time in creative and gotten by but it gets laggy sometimes.
- On student computers (and the one you will use), open the MinecraftEdu Launcher and click the top button, **START MINECRAFTEDU**.

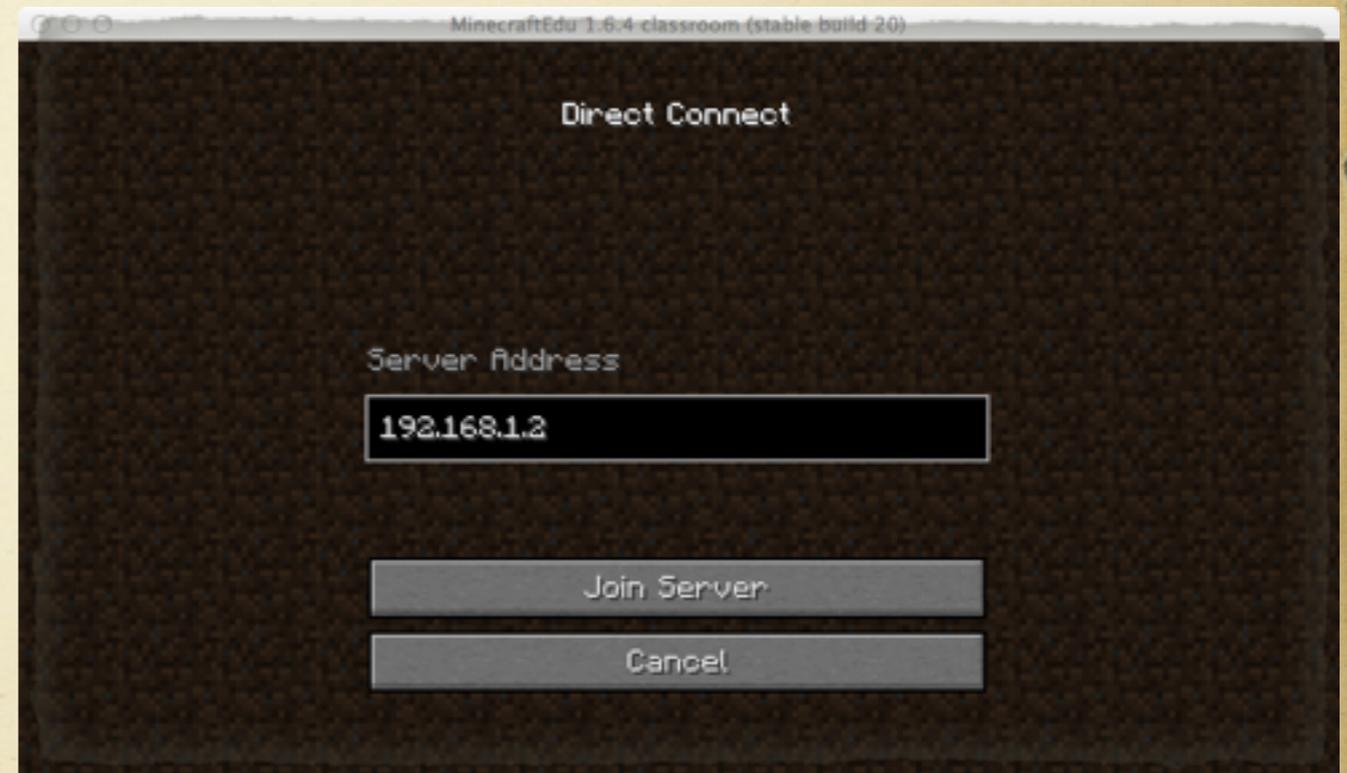
# Students Prepare

- Enter a real name.
- Select gender.
- Click CONTINUE.
- Click MULTIPLAYER.



# Students Log In

- Click DIRECT CONNECT.
- Enter the server address (such as 192.168.1.8) from the top of the server window into the server address box on each client logging in to that server.
- Click JOIN SERVER.
- Students select I AM A STUDENT, choose an appearance, and click CONNECT.
- If no one can fly, switch the game mode to creative in world settings on the server software.



# Running the World

- Use FREEZE to stop individuals or whole classes when you need their full attention.
- Mute chat as needed. The server logs all chat. Use screenshots for documentation if required.
- Teleport yourself to students to check progress or them to you if they get stuck.
- **SAVE THEIR WORK EARLY AND OFTEN. THERE IS NO AUTOSAVE!** If you stop the server without saving all their work is lost.
- Back up their work. Copy the saves folder (not its alias or shortcut) to DropBox every day that they work on the project.

# Join In

- Sign in as a teacher. You will have a distinctive skin.
- The server will prompt you for a teacher password.
- Enter this when you join the game.
- Use teacher controls to move twice as fast as your students, teleport to them (or them to you), freeze them, mute them, and set assignments while the server is running from within the client you are using.
- Monitoring within the server is more effective than over-the-shoulder.

# Building

- Don't worry, your students will teach you all about it.

# What We Covered

- Why MinecraftEdu works better at school.
- How to purchase MinecraftEdu
- How to use Spritecraft to make a map schematic
- How to use MCEdit to flesh out the world for the map
- Tips on running the server and client software

# What Will You Do?

- What geography objectives in your curriculum could be covered by using MinecraftEdu?
- How can you raise funds for this project (hint: student enthusiasm may be put to good use)?
- How much will students determine in the design of the project?

# Contact Info

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