

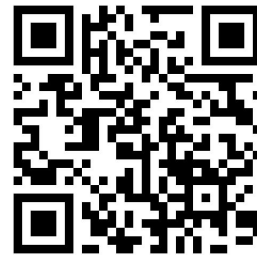


Minecraft MakeCode meets Mark Watney and Mars Colonization

Date: 26 June 2024

Time: 11:15 am

Room: 7010



my slides → wrfryer.me/mars



Wes Fryer
wefryer.com

QR code for:

lessons.wesfryer.com/lessons/minecraft-mars



Mark Watney?

Minecraft?



Minecraft
MakeCode



Actor:
Matt
Damon





Minecraft Mars Outpost



“Building like NASA with Minecraft MakeCode”



lessons.wesfryer.com

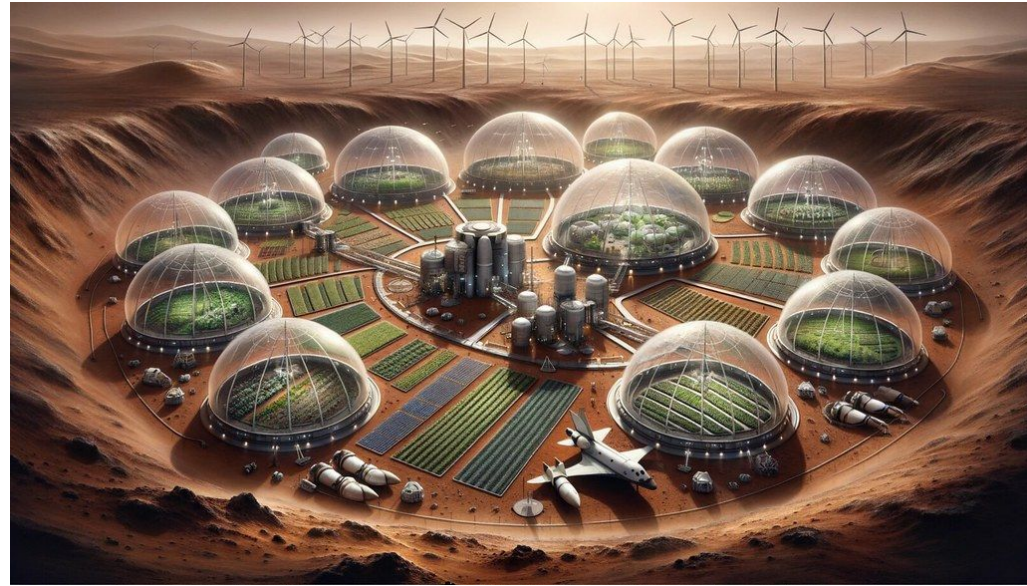
Alternate

Session Titles?

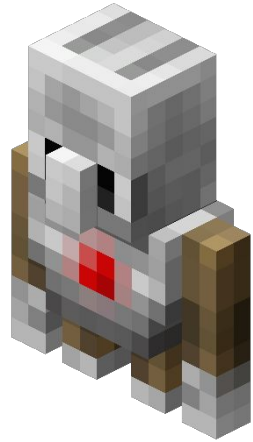
“Coding Mars”

“Minecraft

Mars”

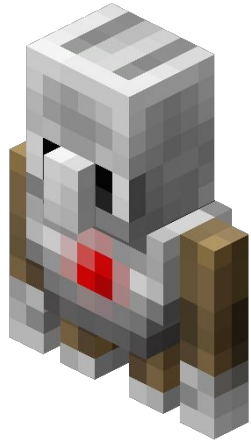


Video Summary... (this in Minecraft)

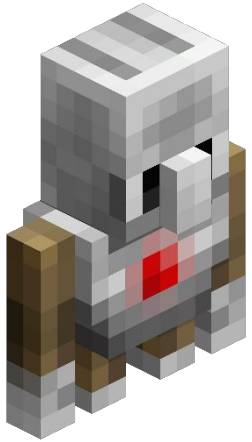


Text Summary...

“Middle school students using Minecraft MakeCode to create Mars habitats with 3D printing techniques similar to NASA's Artemis Moon and Mars missions”



My Thesis today:



“The Minecraft Mars coding project offers students opportunities to develop computational thinking skills alongside rich NASA / space exploration content knowledge in a highly engaging, multidisciplinary unit of inquiry which can be transformative for student learning and career orientation.”





I D E A S

@ P R O V I D E N C E D A Y

www.providenceday.org/academics/ideaspd



PROVIDENCE DAY
SCHOOL

Computer Programming

lessons.wesfryer.com

Coding with Dr. Fryer



Connect with me!

wesfryer.com/after

(slides & lessons!)



Wes Fryer



wesfryer.com



Wes' newsletter



WIKI.WESFRYER.COM

Wes' presentation slides



WEBINARS.WESFRYER.COM

webinars.wesfryer.com



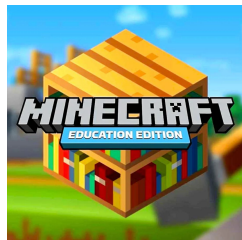
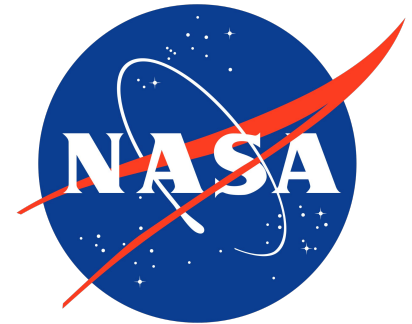
wfryer.me/mars





Outline for our session...

1. Backstory
2. Unit Lessons
3. Future Ideas



 Microsoft |  MakeCode



Sharing under:



Padlet!

- Questions?
- Feedback?
- Ideas?

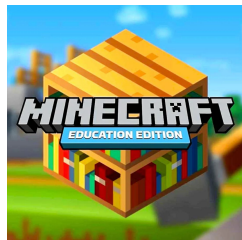
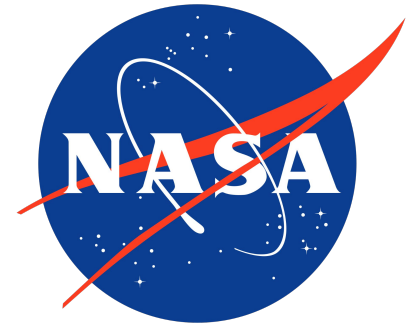


Padlet Feedback for Wes: #NCTIES24

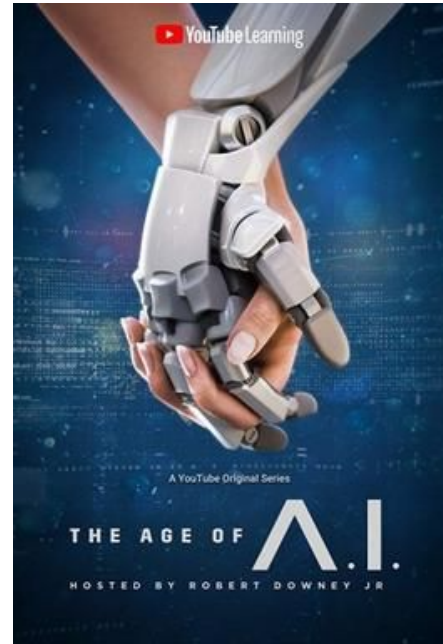
Outline for our session...



- 1. Backstory**
- 2. Unit Lessons**
- 3. Future Ideas**



The 'Space Architects' of Mars | The Age of





MINECRAFT



Casady by the Lake - Virtual Summer Camp - June 2021

Do you enjoy Minecraft?!

Are you interested in participating in a **VIRTUAL MINECRAFT CAMP**?

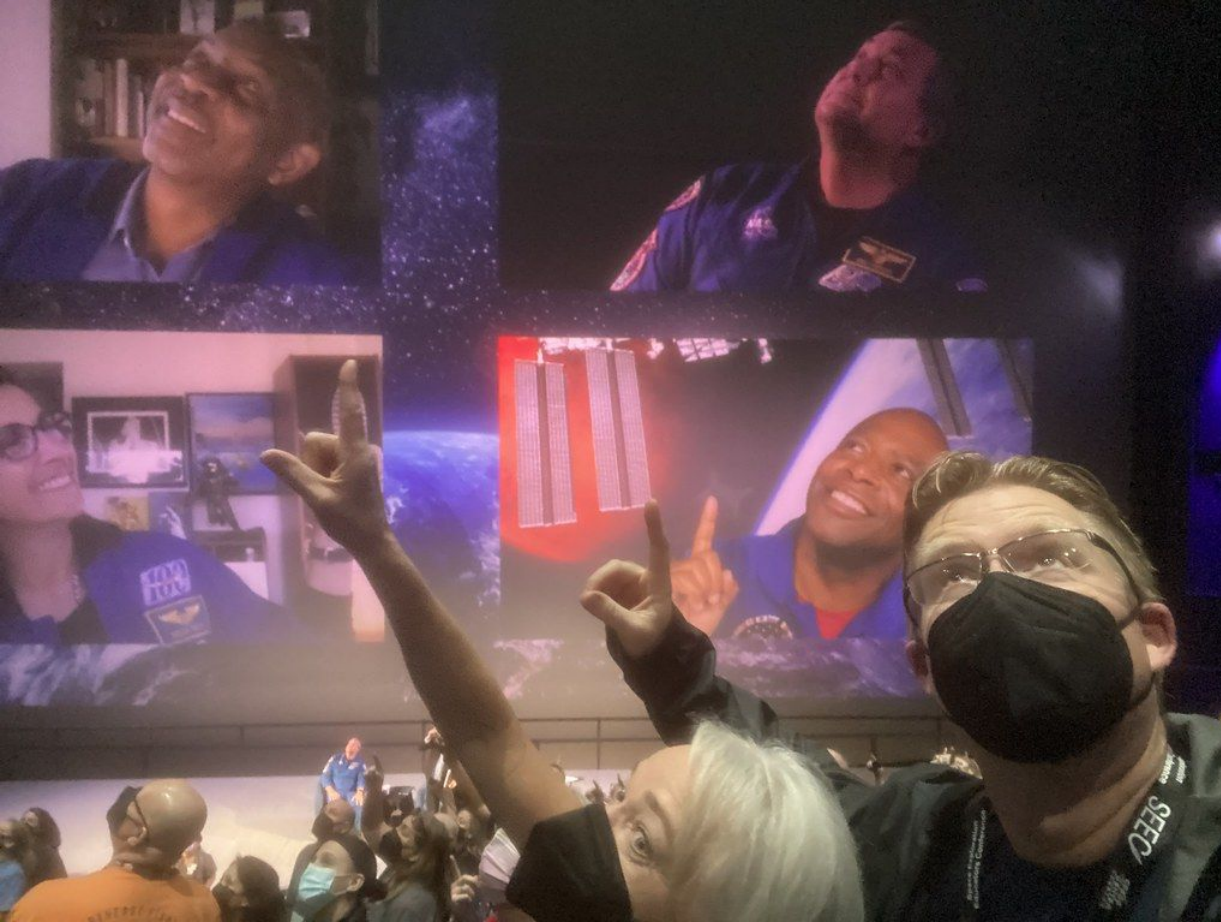
ELEMENTARY Edition: June 7-10, 2021
10am to noon (2 hours) each day

Open to rising 3rd, 4th or 5th graders
(Using Minecraft Education Edition)

MIDDLE SCHOOL Edition: June 14-17, 2021
10am to noon (2 hours) each day

Open to rising 6th, 7th, 8th & 9th graders
(Using Minecraft Education Edition)

sites.google.com/view/mdtech-archived/minecraft



SEEC 2022

spacecenter.org/education-programs/educator-resources/seec/

wfryer.me/mars





Space & STEM Resources

<curated & shared>

by Dr. Wesley Fryer @w Fryer



Space Club Dreams



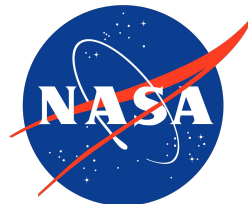
26 August 2023

by Wesley Fryer
wesfryer.com/after

www.speedofcreativity.org



space.wesfryer.com



mastodon.cloud/@w Fryer/tagged/spaceED

w Fryer.me/mars





Rachel - USAFA 2027



“Wonder Links”



Media Literacy with Dr. Fryer

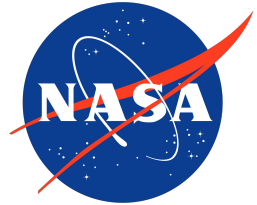


lessons.wesfryer.com

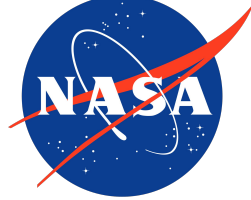
Wonder Links



We are going to the Moon to stay, by 2024. This is how.



3D printing homes on Earth, someday the moon

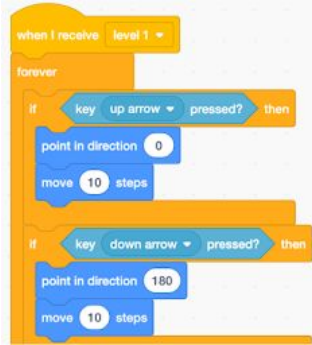


60
MINUTES



Middle School Coding Class Simulates Mars Colony





Computer Programming



lessons.wesfryer.com

Coding with Dr. Fryer



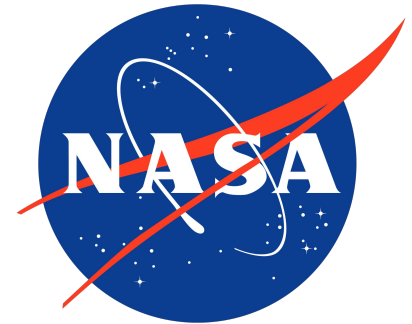
lessons.wesfryer.com/courses/coding

- **Fall 2023: 1 section - 13 students: 11 boys, 2 girls**
- **Spring 2024: 1 section - 21 students: 17 boys, 4 girls**
- **2024: 3 sections! Hoping for 60 students...**



Outline for our session...

1. **Backstory**
2. **Unit Lessons**
3. **Future Ideas**



Access Minecraft-provided lessons INSIDE Minecraft Education



HOW IT WORKS ▾

TEACH WITH MINECRAFT ▾

Quick start →

MINECRAFT SPACE CENTER

Welcome to your first day of training, space explorers!

Science

Technology

Computer Science

8-10

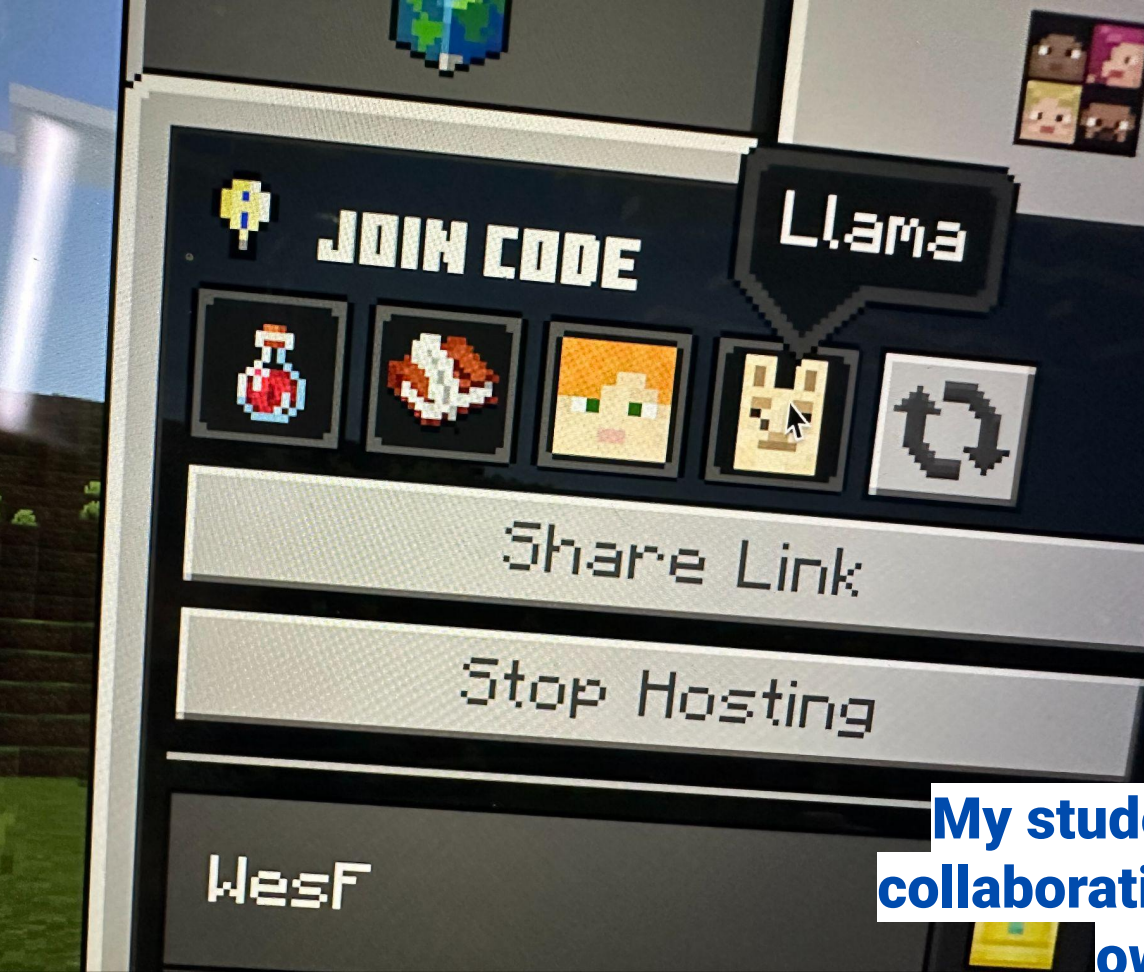
Beginner



Submitted by: [Minecraft Education](#)

Updated: September 16, 2023

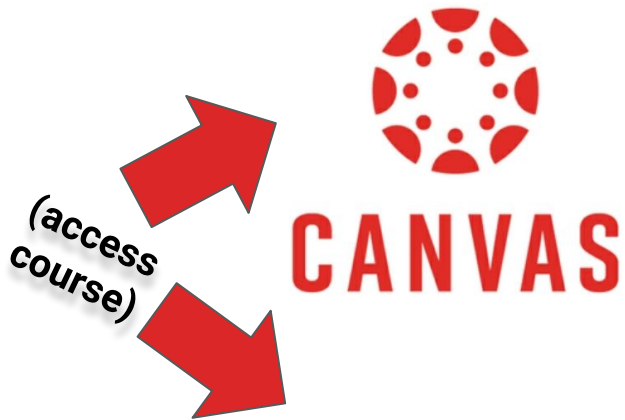
education.minecraft.net/en-us/lessons/minecraft-space-center



My students love building, creating, collaborating... So I have designed my own Minecraft Mars lessons...



Access My Coding Spring 2023 Canvas Course!



providenceday.instructure.com/courses/1037

Sample Canvas Lessons...



4.16 Mars Landing Pad and Habitat Screencast

Due May 21 by 11:59pm Points 20 Submitting a website url

Goals

1. Show and share your creativity in coding and building by hand in Minecraft EDU

Steps

1. Refer to our ["Minecraft MakeCode - "Build a Landing Pad" Challenge Details"](#) spreadsheet.
2. Create a 15 to 60 second SCREENCAST (no audio) showing:
 1. Your landing pad you created with code
 2. Your habitat / dome structure you created with code
 3. Any other "bonus structures" you built in this Mars world.
3. Upload your Screencast video to Google Drive.
4. Set the file so ANYONE WITH THE LINK can VIEW.

2.9 Mars Scratch Animation

Due May 13 by 11:59pm Points 20 Submitting a website url

Goals

1. Use creativity and imagination to animate a planned phase of the Artemis Mars Mission
2. Review animation techniques in Scratch
3. Learn or practice these specific Scratch skills
 1. Import an Animated GIF and loop animate with costume changes
 2. Use a loop to change relative sprite size
 3. Animate multiple sprites simultaneously with BROADCAST or time delay blocks
4. Deepen knowledge and understanding of NASA's Planned Artemis Missions to the Moon and Mars

Clarifications:

1. This is not a "science fiction" animation assignment. (i.e. no aliens)
2. Feel free to be whimsical / silly and have fun with animation elements, but be sure the processes and equipment you are showing "map" to actual NASA plans / reasonable equipment and procedures.
3. While you should brainstorm / collaborate with your classmates (who are working on the same MISSION PHASE) you will EACH create your OWN Scratch Project and recorded animation screencast.

Position: 256, 55, 741
Agent Post: 251, 48, 765



Co **WFRYER.ME/MARS**

Drop

“Code Talk Screencasts”

[Link: Olivia's Example Terrarium Build](#)


Wes Fryer + 42 • 8d

Minecraft Screencasts (2023-24)

Screencasts recorded by middle school students in Dr. Fryer's middle school Computer Programming and Computer Science classes is available on: <https://lessons.wesfryer.com/courses/>

A [Profile] 2mo

Agent Mine and Drop



Video • 00:41


Screen Recording 2023 11 30 at 2 00 05 PM

i think this is the right one :)

0 0

A [Profile] 4mo

Agent Mine




Video • 00:29

Screen Recording 2023 11 14 at 1 44 02 PM

https://makecode.com/_Yquhajw2eLx

A [Profile] 4mo

Robot Mining



Video • 00:34

Screen Recording 2023 10 30 at 1 54 46 PM

0 0

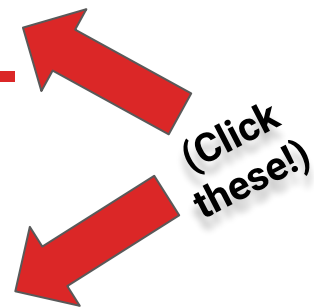
Add comment

```
on chat command "Mine" +
  agent teleport to player
  agent turn left
  repeat 10 times
    do
      repeat 2 times
        do
          agent destroy forward
          agent move forward by 1
          agent destroy up
          agent destroy right
          agent move right by 1
          agent destroy up
          agent move left by 1
```

Code Share

+

Screencast



▼ 02 Scratch and Animation

 2.1 Share Your Scratch Profile Link

 2.2 "About Me" Scratch Project

 2.3 Join our Gimkit Class! 

 2.4 Scratch Intro Part 1

 2.5 Gimkit: Intro to Scratch (FishTopia) 

 2.6 Five Irritating Things

 2.7 Animate a Science Concept / Process

 2.8 Scratch Studio: Science!

Foundational Skills



▼ 03 Game Design

 3.1 Scratch Maze Examples

Feb 9 2 pts

 3.2 Scratch Maze

Feb 14 20 pts

 3.3 Scratch Maze Tournament

 3.4 Screencast Test

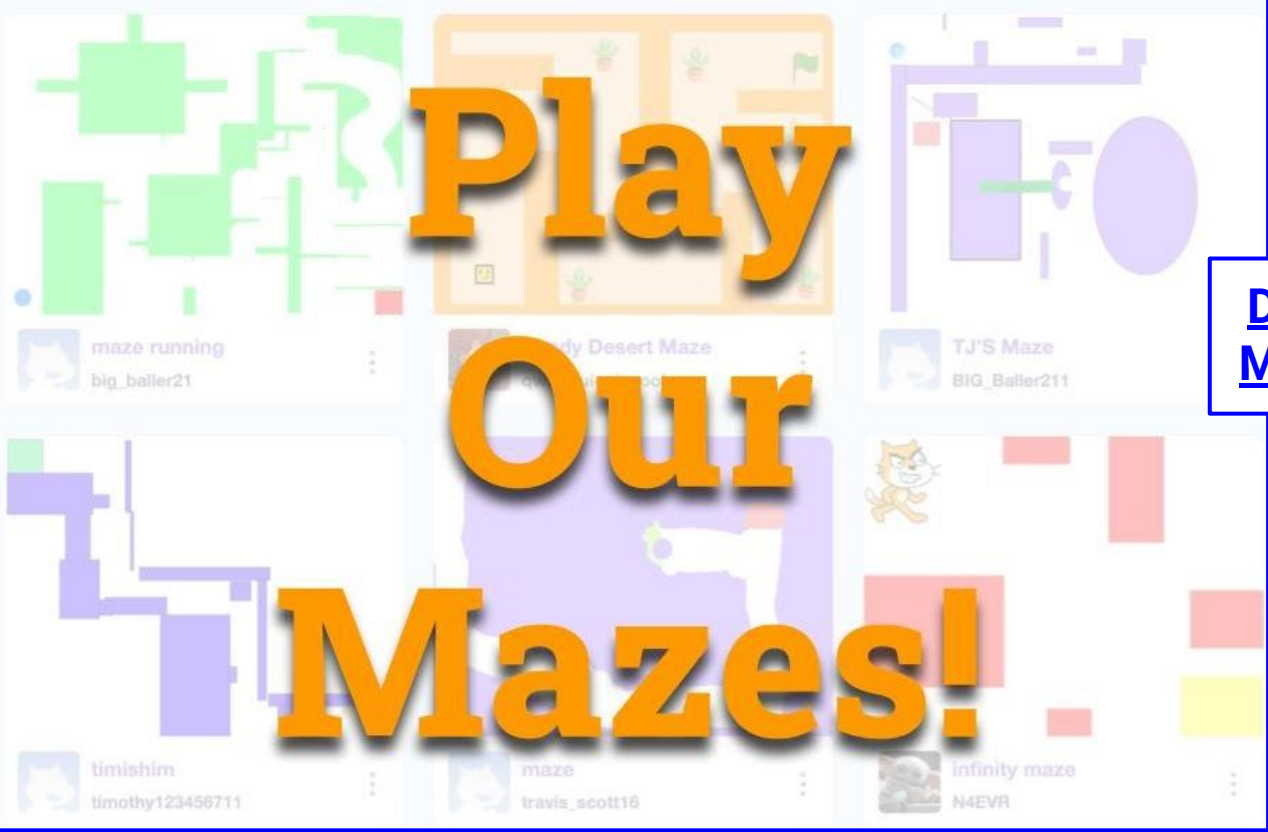
Feb 23 5 pts

 3.5 Scratch Maze Code Talk

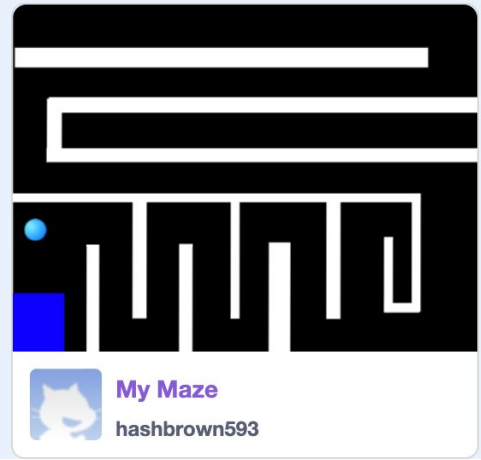
Feb 28 20 pts

Scratch Maze Tournament

Play
Our
Mazes!



[Drag](#)
[Maze](#)



Scratch Animations...



Mars &
Space



Animation!



[lessons.wsfryer.com/courses/coding](https://www.lessons.wsfryer.com/courses/coding)



Visualizations (with AI)



Terrarium / Greenhouse

Experin



**Terrarium /
Greenhouse**

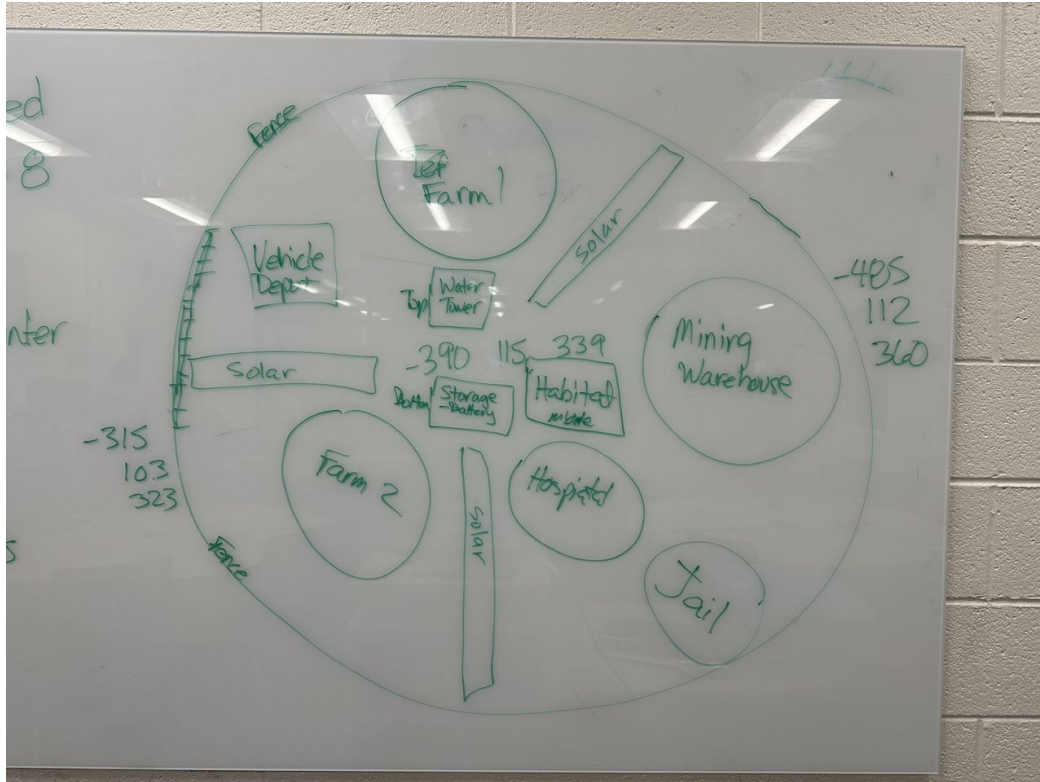


Experiments in
Minecraft Education

lessons.wesfryer.com/lessons/minecraft-mars

A large graphic with a black background. On the left is a red, smiling planet with large white eyes. In the center, the text 'Terrarium / Greenhouse' is written in green. Below that, 'Experiments in Minecraft Education' is written in white. On the right is a larger version of the Minecraft robot character. At the bottom, a URL is written in yellow.

Partner Habitat Construction



Minecraft Mars Colony Build - Team Preferences (Resp

Student Name	1st Choice Team
Micah	Building / Habitats
Ethan	Building / Habitats
Wil	Energy / Water
Timothy	Energy / Water
Vihaan	Farming / Terrarium / Greenhouses
Luc	Farming / Terrarium / Greenhouses
Indeera	Hospital / Med Bay
Noah	Hospital / Med Bay
Nadeem	Jail / Security
Alexa	Jail / Security
TJ	Mining / Resource Collection
Josh	Mining / Resource Collection
Stephen	Transportation
Arlo	Transportation

Coordinates in Minecraft

World coordinates

World coordinates are expressed as a set of three *absolute world coordinates* (X Y Z), each number representing a distance along an axis from the world origin.

Coordinate system

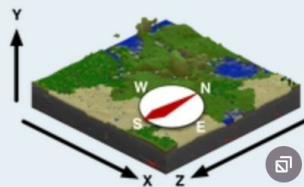
World coordinates are based on a grid where three lines or axes intersect at the origin point.

- The x-axis indicates the player's distance east (positive) or west (negative) of the origin point—i.e., the longitude,
- The z-axis indicates the player's distance south (positive) or north (negative) of the origin point—i.e., the latitude,
- The y-axis indicates how high or low (from 0 to 255 (pre 1.18) or -64 to 320 (from 1.18), with 63 being sea level) the player is—i.e., the [elevation](#),
- The unit length of the three axes equals the side of one block. And, in terms of [real-world measurement](#), one block equals 1 cubic meter.

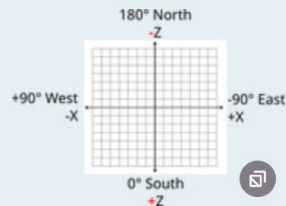
The origin point marks the zero point for the x and z coordinates. Hence, it may be thought of as the 0,0 coordinate:

- X-axis = 0
- Z-axis = 0

minecraft.fandom.com/wiki/Coordinates



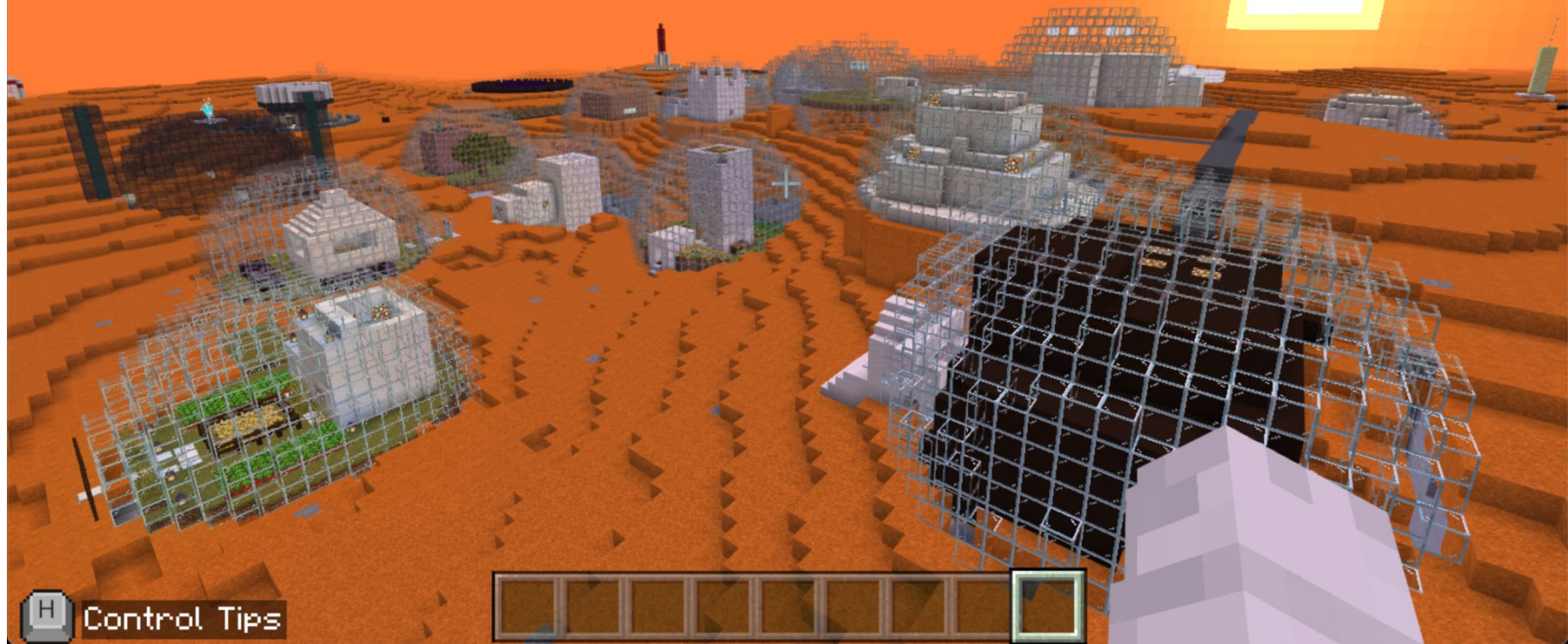
X, Y and Z coordinate on a Minecraft map.



X and Z axes with directions shown, from a birds-eye view. Red highlights where these axes are different than standard.



Position: 464, 54, 717
Agent Pos: 484, 38, 700



Control Tips



AI-assisted lesson design...

OK great, now I need your help to identify 12 different building areas which are outside the existing coordinates of our virtual Minecraft Outpost. I'm uploading a CSV which includes details about the structures we have built and their coordinates. Keep in mind how coordinates in Minecraft Education work: there are 3 numbers, (x, y, z). Y is the VERTICAL coordinate and you can basically ignore it / keep it constant in this situation. X is north / south, and z is east / west. Please provide me with a data table I can readily copy and paste into a Google Sheet with the CENTER coordinate of each build area, the northwest coordinate, and the southeast coordinate. Make each build area at least 20 blocks outside the existing build zones.



ChatGPT

[\(archived ChatGPT conversation\)](#)

New Building Areas

Criteria:

- At least 20 blocks away from existing build zones.
- Size of each build area: 20x20 blocks.

Below is the data table for 12 new build areas with their center, northwest, and southeast coordinates.

Area Number	Center Coordinate	NW Coordinate	SE Coordinate
1	(325, 43, 865)	(315, 43, 855)	(335, 43, 875)
2	(355, 43, 865)	(345, 43, 855)	(365, 43, 875)
3	(385, 43, 865)	(375, 43, 855)	(395, 43, 875)
4	(415, 43, 865)	(405, 43, 855)	(425, 43, 875)
5	(445, 43, 865)	(435, 43, 855)	(455, 43, 875)
6	(475, 43, 865)	(465, 43, 855)	(485, 43, 875)
7	(505, 43, 865)	(495, 43, 855)	(515, 43, 875)
8	(535, 43, 865)	(525, 43, 855)	(545, 43, 875)
9	(565, 43, 865)	(555, 43, 855)	(575, 43, 875)
10	(595, 43, 865)	(585, 43, 855)	(605, 43, 875)
11	(625, 43, 865)	(615, 43, 855)	(635, 43, 875)
12	(655, 43, 865)	(645, 43, 855)	(665, 43, 875)

Coordinates in Minecraft...

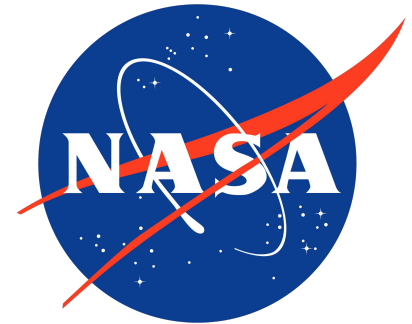
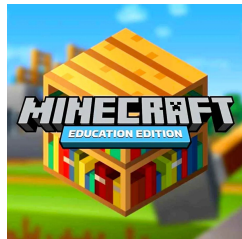


ChatGPT

(archived ChatGPT conversation)

Outline for our session...

1. Backstory
2. Unit Lessons
3. Future Ideas



Class-to-Class Collaboration?



Our Shared Minecraft EDU worlds

Shared with me > Minecraft Saves ▾ 






























Type ▾

People ▾

Modified ▾

 Updates to keyboard shortcuts On Thursday, August 1, 2024, Drive keyboard shortcuts will be updated to give you first-letters naviga

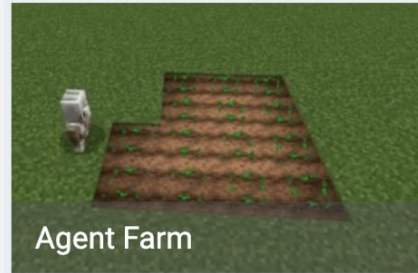
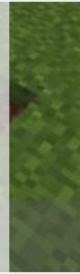
[See shortcu](#)

Name	Owner	Last modified ▾ ↓	File size
 Spleef.mcworld 	 me	May 21, 2024 wes.fryer	10 MB
 Coding-21May-Bedrock Edition 1-19-50.m... 	 wes.fryer	May 21, 2024 wes.fryer	5.5 MB
 coding may 21 2024 FINAL.mcworld 	 ari. 	May 21, 2024 wes.fryer	19.5 MB
 Coding May 20 2024.mcworld 	 ari. 	May 20, 2024 ari.padmana...	19.4 MB
 Coding 17 May 2024 Mars.mcworld 	 luke. 	May 17, 2024 luke.hoffman	19 MB
 Coding 14 May 2024 Mars final.mcworld 	 wes.fryer	May 16, 2024 wes.fryer	19.1 MB
 Coding May 14 2024.mcworld 	 ari. 	May 14, 2024 ari.padmanab...	18.3 MB
 Coding May 13 2024.mcworld 	 ari. 	May 13, 2024 ari.padmanab...	18.1 MB



Screencasts of Tips & Techniques

Agent



minecraft.makecode.com

Questions?



Connect with me!

wesfryer.com/after

(slides & lessons!)



Wes Fryer



wesfryer.com



Wes' newsletter



Wes' presentation slides



webinars.wesfryer.com



wryer.me/mars





Minecraft MakeCode meets Mark Watney and Mars Colonization

Date: 26 June 2024

Time: 11:15 am

Room: 7010



my slides → wrfryer.me/mars



Wes Fryer
wefryer.com