Fairfax Collegiate

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Minecraft Engineering 3-4 Syllabus

Course Goals

1 Basic Engineering Concept
Students learn basic engineering concepts to incorporate into the Minecraft world.

2 Redstone Mechanisms
Students use redstone in Minecraft to generate engineering marvels.

3 Environment and Structures
Students learn about the different biomes and structures of Minecraft and how they relate to their real world counterparts.

4 Basic Programming
Students learn basic fundamentals of programming.

Course Topics

1 Engineering Concepts
Students learn basic engineering concepts such as civil engineering structures, electrical engineering circuits, etc.

2 Redstone
Students practice using redstone to understand concepts of circuits and switches.

3 ComputerCraft
Students use ComputerCraft mod programming on their Minecraft world to learn concepts of programming such as variables and control structures.

4 Coordinate Systems
Students learn about coordinate systems and how to incorporate them into their engineering projects.

5 Texture Customization
Students customize the given map and learn about different resources and their respective textures/role in the world of Minecraft.

Course Schedule

Day 1

Setup
Before class each day make sure all computers are setup and you're familiar with Minecraft and how to start it up. Also, make sure that it's creative mode and not survival mode.

Ice Breaker
Students will play a brief icebreaker to get to know their classmates and the teacher.

Introduction to Engineering
Engage students in group discussion about the different types of engineering and how it can correlate into Minecraft.

Exploration
Have students explore the world of Minecraft and familiarize them to the different aspects of the program in creative mode, as that will be their main learning environment.

Explore Continued
Students who have gotten ahead of the curriculum are encouraged to explore the world using only the techniques that they have developed and that you have gone over.

Day 2

Setup
Before class each day make sure all computers are setup and you're familiar with Minecraft and how to start it up. Also, make sure that it's creative mode and not survival mode.

Coordinates
Coordinates represent your location in the Minecraft world. Have students play around with coordinate systems to get a better understand of how 3D and 2D works.

Explore Continued
Students who have gotten ahead of the curriculum are encouraged to explore the world using only the techniques that they have developed and that you have gone over.

Biomes+
Explanation of overall Minecraft concepts and biomes, continuing the exploration previously presented in lessons.

Day 3

Setup
Before class each day make sure all computers are setup and you're familiar with Minecraft and how to start it up. Also, make sure that it's creative mode and not survival mode.

Redstone Part 1 - Introduction
Introduce the concept of redstone in Minecraft and how it will allow students to automatically open doors, create switch-controlled lights, introduce farms that harvest themselves, and more.

Redstone Part 2 - Circuits
Students build on the introduction of redstone and add more concepts to their repertoire.

Explore Continued
Students who have gotten ahead of the curriculum are encouraged to explore the world using only the techniques that they have developed and that you have gone over.

Day 4

Setup
Before class each day make sure all computers are setup and you're familiar with Minecraft and how to start it up. Also, make sure that it's creative mode and not survival mode.

Redstone Part 3 - Circuits Continued
Students continue to learn the basics of redstone and it's practical use in engineering in Minecraft.

Redstone Part 4 - Ladders and Torches
Students learn about the last section on the basics of redstone.

Day 5

Setup
Before class each day make sure all computers are setup and you're familiar with Minecraft and how to start it up. Also, make sure that it's creative mode and not survival mode.

Redstone Part 5 - Mechanisms
Students expand their knowledge of redstone and other Minecraft materials to engineer more mechanisms.

Redstone Part 6 - Advanced Mechanisms
Students continue to learn more about Redstone in Minecraft and how it relates to engineering.

Day 6

Setup
Before class each day make sure all computers are setup and you're familiar with Minecraft and how to start it up. Also, make sure that it's creative mode and not survival mode.

Redstone Part 7 - Engineering Constructs
Students use knowledge that they've learned about the different redstone mechanisms to create an engineering marvel inside Minecraft.

Redstone Part 8 - Complex Mechanisms
Students will create another more complex mechanism in Minecraft using the knowledge learned thus far.

Day 7

ComputerCraft Part 1 - Introduction
Students learn the basics of programming in Lua and ComputerCraft.

ComputerCraft Part 2 - Conditional Statements
Students begin to learn about conditional statements and how they can be applied in Lua and Minecraft.

Day 8

ComputerCraft Part 3 - Functions
Students learn about functions and how they are used in coding.

ComputerCraft Part 4 - Tables

Students learn about tables and their benefits to coding.

Day 9

ComputerCraft Part 5 - Classes
Students learn about the concept of classes and how it relates to ComputerCraft and Minecraft.

ComputerCraft - Activities
Students use all concepts they know to create programs to work.

Day 10

ComputerCraft - Activities
Students use all concepts they know to create programs to work.

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