Assessment Summary

Course Assessment:	Final project
Unit Assessments:	Quiz
Lesson Assessments:	"Do now," knowledge check questions, and exit ticket

Activity Summary

Each unit includes three types of activities that complement each other by reinforcing different concepts, skills, and opportunities for creativity. The activities for each unit are distributed among lessons of approximately 45-60 minutes each.

Unplugged: These activities are a great way to introduce new concepts in a fun way that gets students up and away from their computers and interacting with each other in person. It's important to introduce the concept first so that students have an introduction to the big ideas they will be exploring with Microsoft MakeCode and Minecraft.

Guided or "Birdhouse": These activities provide step-by-step instructions, and every student makes the same thing. Like the birdhouses you may have made in school wood shop, they introduce new skills and provide an easy way to assess student work because you already know what it's supposed to look like at the end. Students can work through these activities at their own pace and implement optional extensions at the end of these activities if they find they have extra time. Guided activities provide high skills development but low creativity because everyone is making the same thing. It's important not to stop after these activities. Go beyond the birdhouse!

Independent Project: Each unit culminates in an independent project, an opportunity for each student to "show what you know" by demonstrating the skills they learned in the guided activities. Some of the independent projects are paired independent projects, in which students are encouraged to work with a partner on building something together. Creative projects enable students to apply new skills and concept knowledge in a unique context and provide lots of opportunity for creativity. Try to build in opportunities for students to share their projects with each other, or with the class!

Creative Coding   Ages 11-14 | Grades 6, 7, 8

MINECRAFT

	Concepts	Skills Development	Creativity
Unplugged	High	Medium	Low
Guided or "Birdhouse"	Low	High	Medium
Independent Project	Medium	Low	High

Unit 1: Introduction

A. Minecraft and Microsoft MakeCode

- Describe computer science and coding and its importance
- Learn to play and maneuver in Minecraft: Education Edition
- Understand block programming in Microsoft MakeCode
- Change your Minecraft world through coding

Unit 2: Events

A. Introduction to events
B. Coding with events
C. Linking events
D. Get creative with events

- Describe the different kinds of coding events
- Understand the importance of events while playing Minecraft
- Understand the importance of events in coding
- Learn about real-life events and how they can affect situations
- Alter the Minecraft landscape through coding with events
- Design an original creative project to change their Minecraft world through coding events

Unit 3: Coordinates

    A. Introduction to coordinates
    B. Coding with coordinates
    C. Automating actions with coordinates
    D. Get creative with coordinates

• Describe the difference between relative coordinates and absolute coordinates in real life
• Identify your real-world position and calculate the position of a landmark or object relative to your position
• Describe the difference between relative player position and absolute world position in Minecraft
• Understand the importance of coordinates in coding and while playing Minecraft
• Alter the Minecraft landscape by coding with coordinates
• Design an original creative project to apply your coding skills in new ways

Unit 4: Variables

    A. Introduction to variables
    B. Coding with variables
    C. Combining variables
    D. Get creative with variables

• Describe the different kinds of coding variables
• Understand the importance of variables while playing Minecraft
• Understand the importance of variables in coding
• Learn about real-life variables and how they can affect situations
• Alter the Minecraft landscape through coding with variables
• Design an original creative project to change their Minecraft world through coding an automated solution with variables

Unit 5: Conditionals

A. Introduction to conditionals
B. Coding with conditionals
C. Debug problem code with conditionals
D. Get creative with conditionals

• Describe the importance of conditionals in coding
• Create IF THEN and IF THEN ELSE conditional statements
• Code with a variety of conditional blocks to automate their agent to find and collect important resources
• Evaluate code to identify problems like infinite loops and debug the code with conditionals
• Add a Say block inside if-then blocks to help debug problem code
• Work collaboratively to design an original creative project to apply their coding skills in new ways

Unit 6: Functions

A. Introduction to functions
B. Coding with functions
C. Building on functions
D. Get creative with functions

• Describe the different kinds of coding functions
• Understand the importance of functions while playing Minecraft
• Understand the importance of functions in coding
• Learn about real-life functions and how they can affect situations
• Alter the Minecraft landscape through coding Design an original creative project to change their Minecraft world through coding an automated solution with functions

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Unit 7: Iteration

  A. Introduction to iteration
  B. Coding with iteration
  C. Debugging with iteration
  D. Get creative with iteration

- Understand the use of iteration in coding and synonymous terms used by programmers
- List examples of iteration in daily life
- Describe the different types of loops in MakeCode
- Use different types of loops to debug and code more efficiently
- Design an original creative project to automate a solution with iteration

Unit 8: Arrays

  A. Introduction to arrays
  B. Coding with arrays
  C. Building on arrays
  D. Get creative with arrays

- Understand the usefulness of arrays in coding as a collection of related items
- List examples of arrays in real life
- Use the array operations to add and arrange items
- Describe array indexes and elements in MakeCode
- Sort array values with basic sorting algorithms
- Design an original creative project that uses arrays to create a piece of artwork in Minecraft

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Unit 9: Artificial intelligence

    A. Introduction to artificial intelligence
    B. Coding an intelligent agent
    C. Get creative with artificial intelligence

- Identify factors that distinguish humans from machines
- Recognize that computers model intelligent behavior
- Understand the importance of artificial intelligence and explore some of the ethics and fears relating to artificial intelligence
- Find opportunities to code your agent to behave intelligently in Minecraft
- Design an original creative project to teach your agent to intelligently adapt to the Minecraft environment

Unit 10: Final independent project

    A. Introduction to the project
    B. Coding the project
    C. Beta test and finalize the project

- Design an original creative project to program four tools for a survival backpack to help you in a Minecraft world
- Demonstrate your learned coding skills and apply them in a new way
- Validate your approach to the project, including beta testing and analysis of code to debug and problem solve