HOUR OF CODE 2023

EDUCATOR GUIDE

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HOW TO GET STARTED - MINECRAFT EDUCATION

If you are licensed to use Minecraft Education through your O365 EDU account, download directly at aka.ms/download or reach out to your IT department for assistance. More information on deployment and license assignment can be found at aka.ms/meedeployguide.

Here's how to get setup:
1. First, check here to see if your school account is eligible.
2. If you do not have a valid O365 EDU account, you can still download and play for free on Windows, Mac or iPad.
3. Download Minecraft Education for Windows, Mac or iPad.

Once you are set-up with Minecraft Education, you should:

- Learn about Hour of Code 2023: Generation AI with this introduction video.
- Use this Educator Guide, Classroom Presentation, and Solutions Guide to help you prepare for your own Hour of Code 2023 experience.
- Play through the Hour of Code 2023: Generation AI game or watch the walkthrough video to get more familiar with the game play!

THEME OVERVIEW

Team up with the trusty Agent to build helpful AI-powered inventions in this year's Minecraft Hour of Code: Generation AI! Players will correct coding problems, solve fun puzzles, and use the principles of responsible artificial intelligence (AI) while exploring the amazing potential AI and the importance of fair, reliable technology. With coding in Blocks or Python, Minecraft Hour of Code allows anyone to learn the basics of coding and how to build better AI for all.

Minecraft Education is a unique, safe space for young people to explore AI: it's inherently engaging, effective for conceptual understanding, and offers in-game coding with fun, immersive narratives to reinforce learning.

WELCOME TO MINECRAFT'S HOUR OF CODE 2023: GENERATION AI!

HOUR OF CODE 2023: GENERATION AI— LESSON

Lesson Objectives

By the end of this lesson, students will be able to:

- Explain the concept of Artificial Intelligence (AI) and its relevance in different aspects of our daily lives.
- Explore the rules that make sure AI is helpful, safe, and fair for everyone.
- Utilize coding concepts and computational thinking to develop algorithmic reasoning and problem decomposition skills for creating effective coding solutions.
- Understand the potential impacts of AI on people and society
- Apply new learning about AI to gain awareness of CS career connections.

Lesson Overview

Join the exciting expedition in "Minecraft Hour of Code: Generation AI," where each player pairs with the whimsical AI Guides for a thrilling adventure through AI's potential. Begin with hands-on tasks like fixing a quirky motion sensor that's unfairly picky about height, introducing the importance of fairness in AI. Leap forward to puzzles, like tinkering with a clunky robotic lawnmower, to grasp the nuts and bolts of AI safety. With every step, the puzzles evolve, just like the players' savvy in coding, bringing to light the essentials of transparency and security.

The grand finale? Students teach the collective of AI Guides, cementing the AI principles they've mastered in a fun, engaging way. In a twist ending, players discover their Time Agent is their own AI creation, unlocking a creative sandbox where they can innovate and craft with their AI sidekick. This game magically transforms coding lessons into an adventure, inspiring young minds to shape the future of technology with care and creativity.

GUIDING IDEAS:

What is Responsible Artificial Intelligence (AI)?

Responsible Artificial Intelligence (Responsible AI) is an approach to developing, assessing, and deploying AI systems in a safe, trustworthy, and ethical way.

In the Hour of Code: Generation AI, learners will explore the principles of responsible AI and how they can ensure that AI is helpful, safe, and fair for everyone:

Fairness: AI systems should treat all people fairly.

Reliability & Safety: AI systems should perform reliably and safely.

Privacy & Security: AI systems should be secure and respect privacy.

Inclusiveness: AI systems should empower everyone and engage people.

Transparency: AI systems should be understandable.

Accountability: People should be accountable for AI systems.

Practical Implications for Students and Educators Using AI

Data Privacy

AI uses data to learn and study patterns. Educators should use this opportunity to review data privacy practices with students.

- Students should review the data privacy settings on any tool.
- Students should use the "public post test" as a guide— or, " Stop and think…before I share." If they wouldn't publicly post this information, then they should not share with a chatbot or any other AI either.

Critical Thinking and Digital Literacy Skills

AI is a language model, not a knowledge model. AI will pull together information from the data sets available. As many of us are already aware, anyone can post information on the Internet. It does not necessarily mean it is accurate or credible.

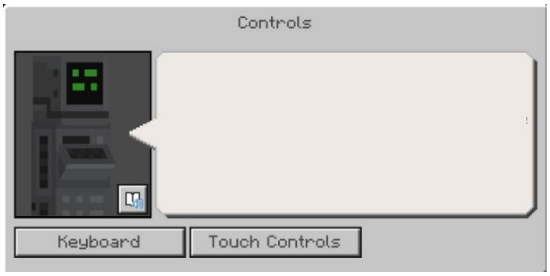
- Students should be cautious when looking for information. Students should be encouraged to ask the AI to reevaluate the information.
- Students should use AI in conjunction with other reliable research methods, such as Search Coach. Search Coach is a tool that provides context and guidance for students to ask effective questions and discover reliable sources.

ACTIVITY EXPLANATION

Beginning the Map

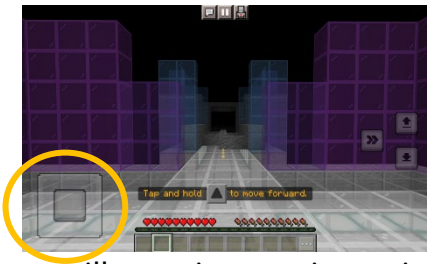
When the world launches, players will spawn into a dark bedroom. They will be prompted to press a key to start the map for a short tutorial that will teach players basic Minecraft movement skills needed to complete the Hour of Code. These include: looking, moving, jumping, NPCs, placing and breaking blocks, and interacting with buttons.

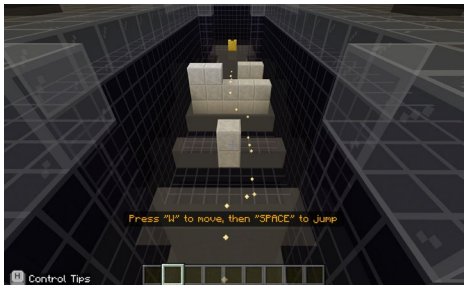
They will then be immediately prompted to select their control scheme: keyboard or touch controls.



The player will receive another message, which will ask the player to start tutorial or skip the tutorial. The tutorial will teach the basics of navigating in Minecraft.

Tutorial Sequence

KEYBOARD	TOUCH CONTROLS
Look Tutorial	
 Players will need to use their mouse and place the “+” (crosshairs) on the golden orbs. The player should look at the golden orb until it disappears. They will look at 9 golden orbs before moving on to the next task.	 Players will swipe to look at the golden orb. They will hold until the orb turns white and then disappears. They will look at 9 golden orbs before moving on to the next task.
Movement Tutorial	
 Players will practice moving in the game using the WASD keys. Press “W” to move forward. Press “A” to move right. Press “D” to move left.	 Players will practice moving using the touch controls. The arrows on the touch control (on the bottom left-hand side of the screen) will indicate what direction they can move.
 Players need to move past the wall by either moving left or right.	 Players need to move past the wall by either moving left or right.

<table>
<tr><th colspan="2">Jump Tutorial</th></tr>
<tr>
<td> 

Players should press “W” to move forward and then press “space” to jump. Players should move towards the gold block.</td>
<td> 

Players need to tap and hold the  (forward command) and then press the  to jump.</td>
</tr>
<tr><th colspan="2">NPC Tutorial</th></tr>
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<td> 

Players will need to aim and right-click the NPC (non-player character) with the  next to them.</td>
<td> 

Players need to aim and tap on the NPC (non-player character) with the  next to them.</td>
</tr>
<tr><th colspan="2">Placing Blocks Tutorial</th></tr>
<tr>
<td> 

Players will need to select an item slot containing an item or block. To place a block, players need to aim towards the surface of another block near them.</td>
<td> 

Players will need to select an item slot containing an item or block. To place a block, players need to aim towards the surface of another block near them.</td>
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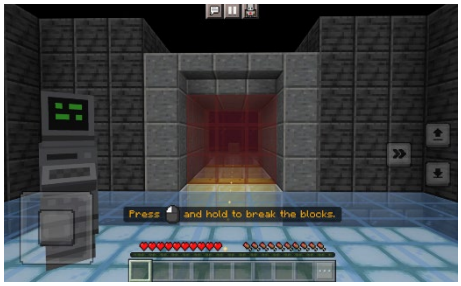
</table>

Right-clicking the block in hand will place the block if the space is valid.	Aim and tap the space to place the block.
 Players will then need to practice placing more blocks to create a bridge across this area.	 Players will then need to practice placing more blocks to create a bridge across this area.
Breaking Blocks Tutorial	
 Players will need to aim and hold down on left-click to break the block. Players will need to break through two walls of red glass.	 Players will need to aim and hold down to break the block. Players will need to break through two walls of red glass.
Interaction Tutorial	
 Players will need to interact by right-clicking the button.	 Players need to press the button.

Welcome to Hour of Code 2023: Generation AI!
Let's get started...

Game Play Activities

The Hour of Code lessons consists of several coding activities, where players will be jumping through time (pillars) and fixing their AI inventions. The following section will walk you, step by step, through all the activities in the Hour of Code: Generation AI.

The player will appear in the bedroom. They will be instructed to interact with the computer.

After interacting with the computer, the player will meet their Agent! Their Agent is a type of artificial intelligence (AI).

IMPORTANT VOCABULARY:

Artificial Intelligence – type of "thinking" or "smartness" that humans have made for machines or computers

ACTIVITY 1: FAIRNESS AND INCLUSIVENESS

Players will need to build a bridge from their present location to the red pillar. Their Agent will provide blocks into the first slot of their inventory.

Once they build a bridge to the red pillar, they will meet an AI Guide. In this activity, they will learn about the AI principles of fairness and inclusiveness.

FAIRNESS AND INCLUSIVENESS		
Activity	**Objective**	**Activity Explanation**
Lunchtime Service	Fix the existing AI code to **scan SMART** for ALL students.	You made an AI to automatically serve lunch to your classmates at school. However, the AI only scans for individuals at a certain height. This is causing a problem; we need to change the AI to be both fair and inclusive.
		

Players will need to select a programming language for the Hour of Code experience. Blocks are best for beginners. Python should only be selected if a player has coded in it previously.

NOTE: Once a player selects a programming language, they are unable to change their selection for the remainder of the game.

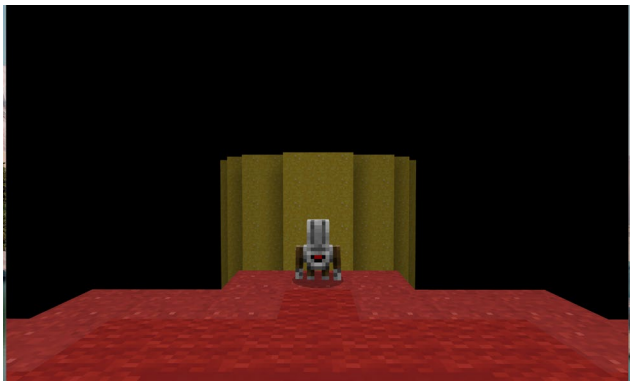
IMPORTANT VOCABULARY:

Fairness – impartial and just treatment or behavior without favoritism or discrimination

Inclusiveness – the practice or policy of providing equal access to opportunities and resources for people who might otherwise be excluded or marginalized

ACTIVITY 2: RELIABILITY AND SAFETY

To continue on their AI journey, players will need to reach the AI Guide on yellow pillar. This time, players will have the ability to code the Agent to build a bridge for them.



Players should test the existing code first. Then, they will need to reset the activity using the "Reset Activity" button (shown below).

Once they have reached the yellow pillar, they will meet their next AI Guide, who will help them learn the AI principles of reliability and safety.

RELIABILITY AND SAFETY		
Activity	**Objective**	**Activity Explanation**
Smart Lawnmower	Change the code for the smart lawnmower to **check for sprinkler heads before cutting the grass.**	You made an AI to automatically mow your lawn! However, the lawnmower is running over the sprinkler heads and causing damage. You will need to change the existing code to have the lawnmower check the area for sprinkler heads and avoid causing any more damage!
		

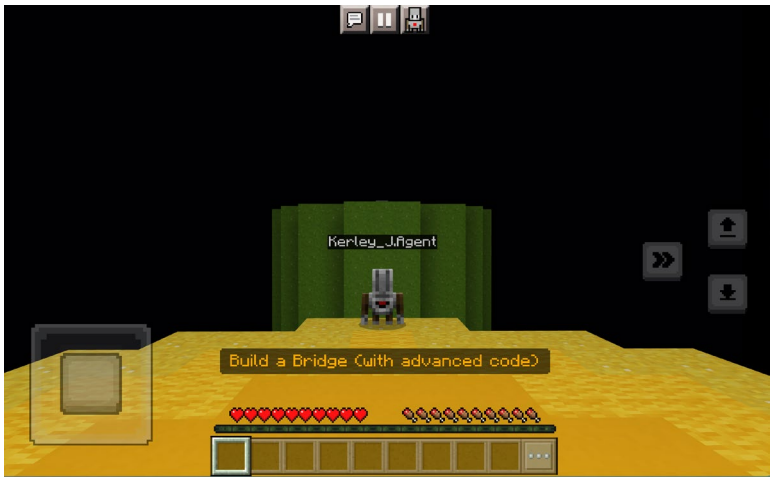
IMPORTANT VOCABULARY:

Reliability – the degree to which the result of an AI specification can be depended on to be accurate

Safety – the condition of being protected from or unlikely to cause danger, risk, or injury

ACTIVITY 3: TRANSPARENCY AND ACCOUNTABILITY

This time, players will use an advanced coding concept, known as loops, within the code. Players will code the Agent (using loops) to build a bridge to the next pillar (i.e., green pillar).



Once they have reached the green pillar, they will meet their next guide, who will help them learn the AI principles of transparency and accountability.

TRANSPARENCY AND ACCOUNTABILITY		
Activity	**Objective**	**Activity Explanation**
Trash Collector	Follow the birds to investigate what is happening in the code. **Decode the secret words and then update the code** to handle	You made special AI birds, who collect garbage around the town and fly it over to the landfill. However, there is garbage everywhere! Something is clearly not working right... Players will need to investigate the relay boxes, follow the birds to decode the secret words, and

	the trash in a better way.	then update the code to fix the trash problem.

IMPORTANT VOCABULARY:

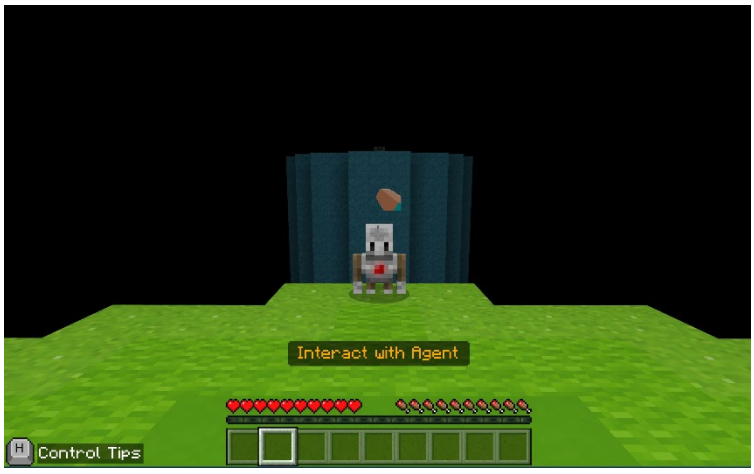
Transparency – the quality of being completely open to public

Accountability – the condition of being held responsible for specific actions

ACTIVITY 4: PRIVACY AND SECURITY

Your Agent has evolved and is rapidly gaining more abilities! You no longer need to manually enter a code to reach the next pillar. You can generate a bridge by selecting a prompt. A **prompt** lets you give instructions to the AI. The AI will respond by generating information based on what you've asked. It's a new way for you to communicate with the AI!

To build the bridge to reach the blue pillar, interact with the AI Guide.



Players will be able to select the following prompts:

- Prompt 1: What kind of bridge would you like? (Rope, Straight, Tall)
- Prompt 2: What material should the bridge be? (Wood, Metal, Wool)
- Prompt 3: How big should the bridge be? (Small, Super Big, Just Right)

Once they have reached the blue pillar, they will meet their next AI Guide, who will help them learn the AI principles of privacy and security.

PRIVACY AND SECURITY		
Activity	**Objective**	**Activity Explanation**
Door Access	Check the door for access bugs. Then, use the Co-Crafter AI Assistant on the computer to check the code. **Change the code for admins** to resolve the problem.	You made the most secure smart locks on the market, known as AI Tech Locks. Unfortunately, a customer is not very happy with their smart lock. Every time they sit down for dinner, salespeople show up at their door. How do they always know when they home?!
		

IMPORTANT VOCABULARY:

Privacy – the right to be left alone from interference or intrusion

Security – the protection from harm, theft, and/or unauthorized use

ACTIVITY 5: TRAIN THE RESPONSIBLE AI

Players will ride the scooter to the last pillar. The last pillar is the opportunity for players to demonstrate their new knowledge about responsible AI.

When they arrive at the last pillar, they will be responsible for teaching the AI. They will need to consider the principles of responsible AI and match the AIs to the correct statements.

STATEMENTS	PRINCIPLES OF RESPONSIBLE AI
Train the AI with a wide range of objects and people.	Players are responsible for matching each of the statements with the correct Principle of Responsible AI. Selections include: • Fairness and Inclusiveness • Reliability and Safety • Transparency and Accountability • Privacy and Security
Train a self-driving car to understand different road signs.	
Make an AI that hides any information you wouldn't share with a stranger.	
Add a way for users to report incorrect information.	

ACTIVITY 6: CREATE YOUR OWN MAP

Now that players have had the opportunity to teach the Agent in responsible AI, they will be specifically rewarded with an open-game play prompt. Players will be able to make specific prompt selections for the Agent to automatically generate a new special place in Minecraft for them.

Players will be able to create their own world based on the following prompts:

- **Biome**: Savanna, Taiga, Desert, Flower Forest
- **Time of Day**: Sunrise, Noon, Sunset, Midnight
- **Pre-Built Items**: Town, Monument, Starter Home, or Nothing
- **Sharing this Space**: Villagers Only, Mobs Only, Animals Only, Everyone, or Nobody
- **Game Mode**: Survival Mode, Creative Mode, Adventure Mode
- **Kind of Rules**: Peaceful, Normal, Challenging

REFLECTION AND CELEBRATION

After game play has finished, gather students back together to recap their learning and to discuss the **reflection questions.**

- How do you define artificial intelligence?
- Name one principle of responsible AI. Explain this principle.
- How is artificial intelligence used in our everyday lives?
- What do you think is the most important thing to understand about AI?
- What are some of the ethical and societal impacts of AI?
- How will AI impact jobs? What kind of jobs may be created because of AI? How can AI make certain jobs easier or more efficient?

END THE LEARNING EXPERIENCE BY PRESENTING STUDENTS WITH THEIR CERTIFICATION OF COMPLETION!

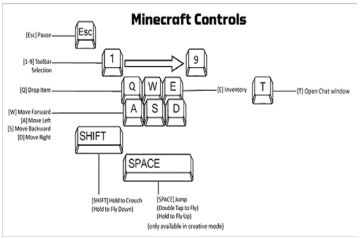
MINECRAFT VISUAL GLOSSARY

AGENT

a form of artificial intelligence that can be coded to complete tasks

CONTROLS

(keyboard)
keyboard buttons that help you move around and complete tasks

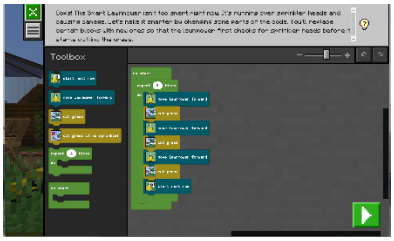


CONTROLS

(touch)
the touch pad that helps you move around and complete tasks

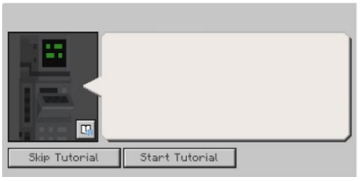
CODE BUILDER

the in-game coding editor for Minecraft Education



DIALOG

a written conversational exchange between the player and NPC



HOTBAR

selection bar that appears on the bottom of the screen

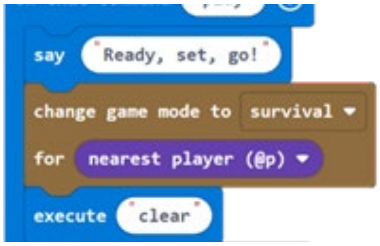
PYTHON

a text-based programming language used to create code

```
# Say Hello!
greeting = "Hello World!"
say(greeting)
# Introduce yourself!
myname = "Anonymous"
say(myname)
# try both
say(greeting,myname)
```

MAKECODE BLOCKS

visual programming blocks used to create code



MINECRAFT EDUCATION

a game-based learning platform

INVENTORY

a menu displaying all blocks, tools, and resources in Minecraft

BLOCKS

the basic unit of structure in Minecraft

NPC

non-player character in Minecraft

Educational Standards - Computer Science

Computer Science Teachers Association (CSTA) - United States

CSTA Standards			
Elementary (K-2)	**Elementary (3-5)**	**Middle (6-8)**	**High (9-12)**
1A-AP-14 Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops. **1A-IC-16** Compare how people live and work before and after the implementation or adoption of new computing technology.	**1B-AP-15** Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended. **1B-IC-18** Discuss computing technologies that have changed the world, and express how those technologies influence, and are influenced by, cultural practices.	**2-AP-17** Systematically test and refine programs using a range of test cases. **2-IC-20** Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.	**3A-IC-24** Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices. **3B-IC-27** Predict how computational innovations that have revolutionized aspects of our culture might evolve.

International Society for Technology in Education (ISTE) - United States

Empowered Learner
• 1.1d Students understand the fundamental concepts of technology operations; demonstrate the ability to choose, use and troubleshoot current technologies; and are able to transfer their knowledge to explore emerging technologies.

Computing Programmes of Study - National Curriculum in England

Key Stage 3

Aims

- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems

Subject content

- Recall that a general-purpose computing system is a device for executing programs.
- Describe how AI differs from traditional programming.
- Identify examples of AI in the real world.

- Associate the use of artificial intelligence with moral dilemmas.

EDUCATIONAL STANDARDS – COMPUTER SCIENCE

AUSTRALIAN F-10 CURRICULUM – DIGITAL TECHNOLOGIES

Year 7 and 8

Investigate the ways in which products, services and environments evolve locally, regionally and globally and how competing factors including social, ethical, sustainability considerations are prioritised in the development of technologies and designed solutions for preferred futures (ACTDEK029)

- investigating how ethics, social values, profitability and sustainability considerations impact on design and technologies
- identifying needs and new opportunities for design and enterprise

Year 9 and 10

Explain how products, services and environments evolve with consideration of preferred futures and the impact of emerging technologies on design decisions (ACTDEK041)

- considering how creativity, innovation and enterprise contribute to how products, services and environments evolve
- explaining the consequences of social, ethical and sustainability decisions for products, services and environments
- predicting the impact of emerging technologies for preferred futures
- constructing scenarios of how the future may unfold (forecasting) and what impacts there may be for society and particular groups, and back casting from preferred futures