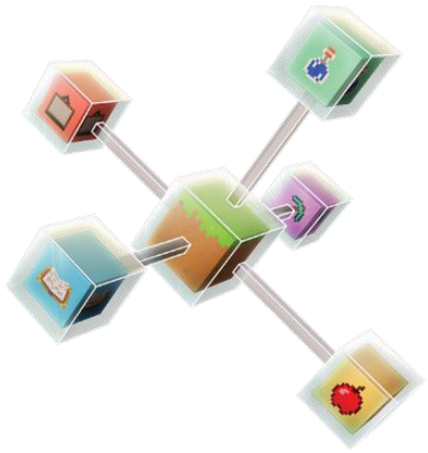
COMPUTING WITH MINECRAFT 1: THE AGENCY

Student workbook

education.minecraft.net

CONTENTS



OVERVIEW

Unit summary

This unit introduces computer programming with Minecraft: Education Edition and Microsoft MakeCode. You'll play in a special Minecraft world where you'll get to know your Agent and build an entire city with roads, buildings, a park, zoo, and wind farm—all through coding!

Learning goals

By the end of this unit, you'll be able to:

- Describe coding.
- Launch and connect Microsoft MakeCode to Minecraft: Education Edition.
- Play and maneuver in Minecraft: Education Edition.
- Use on-chat commands and code your Agent to move in different directions, use inventory, and build a bridge in Minecraft.

LESSON 1: PLAN

Lesson part	Timing
Minecraft Introduction	10 min
Movement tutorial, place & break tutorial	10 min
MakeCode Introduction	10 min
Coding a conversation with the Agent	5 min
Teleport the Agent	5 min
Assessment	5 min

LESSON 1: CODE A CONVERSATION WITH YOUR AGENT & TELEPORT YOUR AGENT

Overview: Introducing Minecraft: Education Edition

Minecraft is an online game about placing blocks and going on adventures, set in infinite worlds of wide open terrain. It extends up into the hills and mountains, and down into dark caverns filled with lava and treasure.

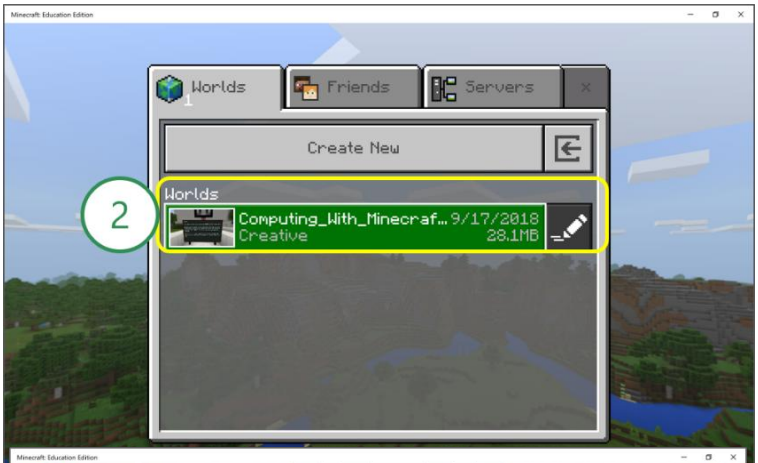
Just like a sandbox, there are no specific goals in Minecraft, no set objectives to fill. The fun comes from setting your own goals and deciding how you want to play on a given day. Maybe you will head into the jungle in search of a jungle temple. Perhaps you will build your dream tree house with a perfect view of the ocean, or mine deep underground in search of emeralds and diamonds. Whenever one task becomes too difficult, or boring, or when you get stuck and need some help or inspiration, you can just choose to do something else. There is always something engaging to do, and no matter what you choose to do, you will always learn more about the world around you and be thinking about better and more efficient ways to accomplish what you want to do.

MINECRAFT INTRODUCTION: Watch a video on how to set up the Minecraft: Education Edition game!

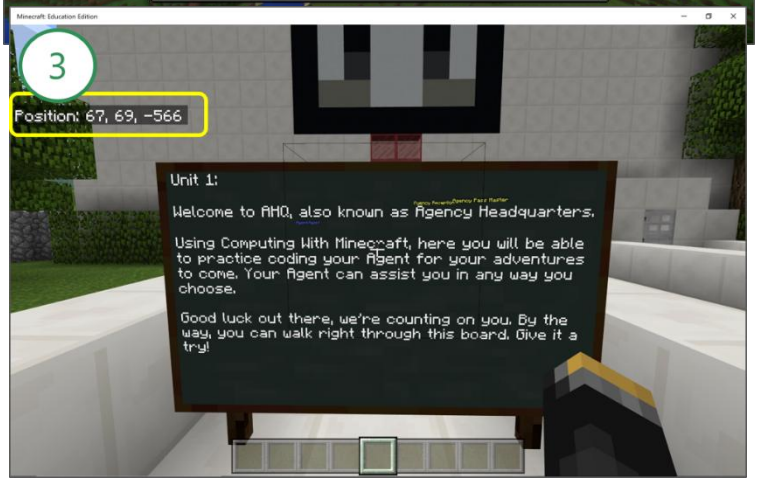
Setting up the game

1. From the main game screen, you can:
    a. Your player's name
    b. Change your Player's skin & avatar
    c. Select Settings to check on the audio settings
    d. Click Play

2. From here you can select an existing world or create a new world. Select **the world that has been pre-loaded**!



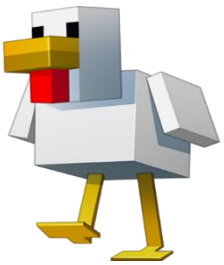
3. Now you're in the game! Everything you see is from the perspective of your player avatar. This is where we'll start our adventure, following the instructions on the signs to build a city.



Moving around in Minecraft

Using your mouse

Move the mouse	→	Look around
Left mouse button	→	Mine or attack
Right mouse button	→	Use a piece of inventory
Scroll wheel	→	Toolbar selection



Using your keyboard

W	Moves your player forward
A	Moves your player left
S	Moves your player backward
D	Moves your player right
E	Opens your inventory
Q	Drops an item

Space	Makes your player jump
Shift	Hold to make your player crouch
Esc	Pauses the game or exits chat mode
1 - **9**	Toolbar selection

Get students into Minecraft and walk them through the sign-in process. Students should be able to select the world and complete

- Movement tutorial
- Break & Place tutorial

Overview: Coding with Microsoft MakeCode

Coding lets you be the boss of a computer! You tell it what to do by giving it instructions. *Code* or a *computer program* gives instructions to a computer to do something. A computer can be a laptop, tablet, smart phone or TV, or any kind of computer. Even robots!

Tip: Coding and computer programming mean the same thing.

Solving a problem by breaking a task down into a series of specific steps in a specific order is called an *algorithm*.

Coding needs algorithms too. We need to write code in a specific order to create the intended outcome with the computer. The wrong order could tell the computer to do the wrong thing.

What steps do you follow to make an egg and tomato dish?

Write your ideas here:

All those things are possible because a computer program created by a human gave the computer the instructions. Coding and computers are a huge part of our lives and impact almost everything we do at school, for fun, in our personal and work lives. The possibilities are endless, and people who code are figuring out more and more ways for computers to help us. No matter what you want to be or do, technology and coding will be part of it. And hopefully this course will get you excited to keep learning to code. You don't have to be geeky or want to be a coder when you grow up. Knowing about how computers work and being able to code is for everyone!

Characteristics of a coding mindset

- Learning something new can be hard.
- Get curious if you're frustrated.
- Keep trying - persistence is important!
- It's ok to ask others for help after you've tried to figure it out.
- Learn from mistakes – each time something doesn't work, you get some information to help you figure out what else might work.

MAKECODE INTRODUCTION: Introducing Microsoft MakeCode

Watch a video introducing MakeCode!

Microsoft MakeCode is a coding editor that's part of an app called Code Connection. Just like humans use different languages to talk to each other, computers use different programming languages. In MakeCode, you can code or program with blocks or JavaScript:

- *Block programming* – an easy way to learn, kind of like using puzzle pieces.
- *JavaScript* – a text-based language using letters, numbers, and symbols. It's one of the most popular programming languages in the world.

Connecting Microsoft MakeCode to Minecraft

1. Press "C"

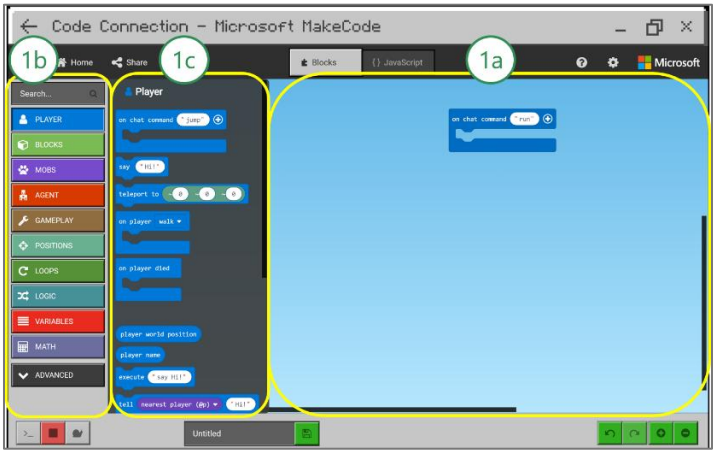
Overview of Microsoft MakeCode

1. Select New Project to see your workspace and tools.

a. The coding Workspace – Where you work with different coding blocks.

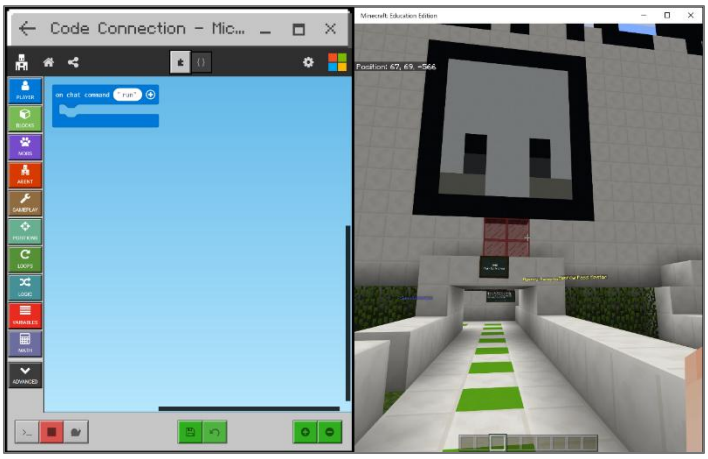
b. Tool box – Where you find different types of code blocks.

c. Tool drawer – When you select a drawer it opens to show the available coding blocks. Point out that the coding blocks in each drawer are color coded for those types of blocks.



2. To exit a project, select the Home button, then Done.

3. Set the app windows side by side on your screen so you can write code in Microsoft MakeCode and run it in Minecraft to see the results!



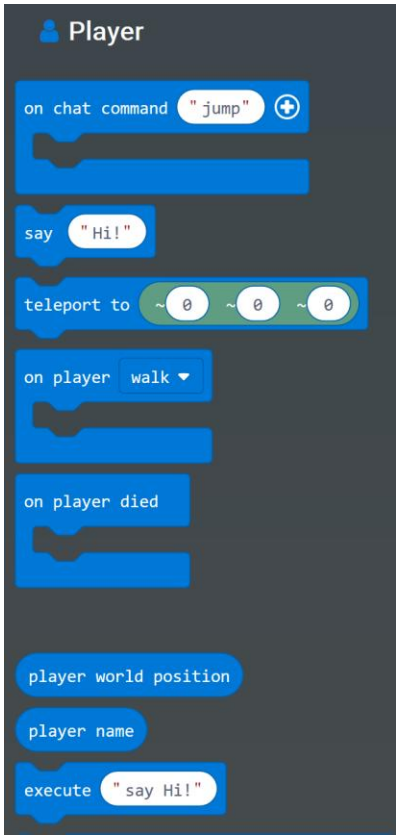
CODING ACTIVITY 1: Code a conversation with your Agent

Watch a video demonstration of coding activity with your students.

Assign your students to do the same activity on their own.

Let's code a simple program of a conversation in the game with on chat commands.

1. Select the PLAYER toolbox drawer from the left-hand menu.

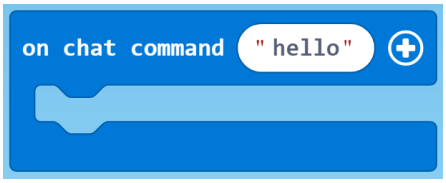


The PLAYER toolbox drawer offers players a series of code blocks that relate directly to you as the player. The code in any of the blocks work in direct response to your own actions. Some respond to you typing in chat function, others respond to you walking in the game or your position, etc.

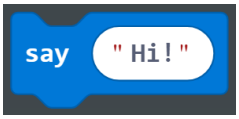
The on chat command block is one of the most used of all the code blocks. It sets a command that you later type into your in-game chat function (engaged by pressing the **T** key). For almost all of your coding commands, you'll use this block to start.

An on chat command triggers or runs the code when you type the appropriate command. The text you type in any of these boxes is case sensitive. Be mindful of this when typing names, etc. In the example above, we have opted not to use capital letters in our commands, but you'll notice we do use them in the computer's responses.

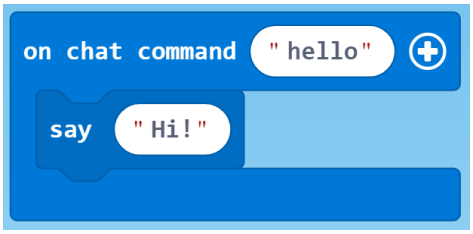
2. Rename the **run** element of this block to **hello.**



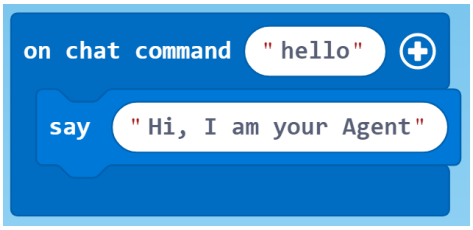
3. Return to the PLAYER menu on the left and drag the **say** block to the main coding window. Notice that the block will look translucent until you attach it to something, see below for a comparison.



4. Drag the say block into the on chat command block to activate it.



5. Rename the **Hi!** element of the say block to **Hi, I am your Agent**.



6. Now test your code. Return to the game and press **T** to open the chat function, then type **hello**. You should see both your own chat as well as **Hi, I am your Agent.**

To close the chat command field in Minecraft, select **Exit** at the top left of the screen or hit **Esc** on the keyboard. This allows you to move the player around to see all the chickens.

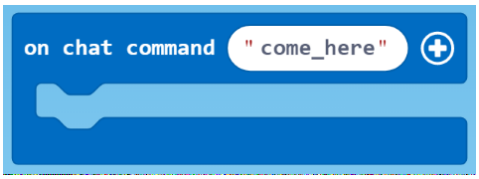
Semi-guided experience:

Now, create multiple strings of conversation to practice giving your Agent on chat command instructions.

You will notice we have used an underscore between each word when giving the Agent an instruction in the on chat command block. This text is called a string or syntax and does not recognise spaces. Use an underscore whenever you use more than one word.

Coding activity: Code to teleport your Agent

1. Start a new project and rename the **run** element of the on chat command block to **come_here**.



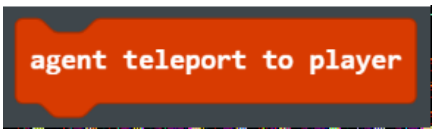
2. Now visit the AGENT drawer on the left-hand menu.

The AGENT drawer offers players a series of code blocks that relate directly to the Agent. The Agent is an assistant who helps you do things in Minecraft. It's a separate in-game but Non-Player Character (NPC) that can be controlled by you. The code in any of the blocks in this drawer act as commands for the Agent and make the Agent move, attack, place blocks, turn and much more.

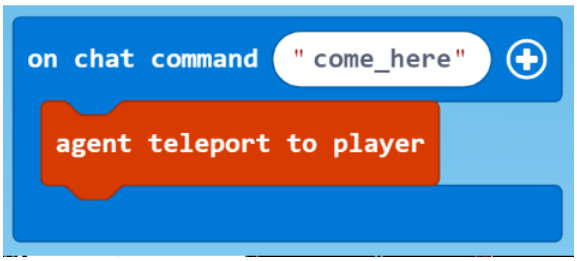
Many of the lessons require you to command the Agent to complete tasks. Combined with the on chat command code block, you can set commands that tell the Agent exactly what to do via the chat feature (pressing the **T** key).

The Agent appears when you teleport it to your player.

3. Drag and drop the agent teleport to player code block to the main coding window. Remember it will look opaque until you attach it to something.



4. Drag and drop the agent teleport to player into the on chat command block.



5. Now test your code. In the game, press **T** to open the chat function. Type **come_here** and watch your Agent appear at your exact location. You can move your player back a few steps or look down to see it.

You can do this anytime you need to bring the Agent to a given starting point to create another movement or action.

6. Move your player away from your Agent and test the **come_here** command to watch your Agent disappear and reappear at your exact location. Do this a few times to get the feel for it.

ASSESSMENT: Assign your students to write answers to the questions below. They have the same questions in their Notebooks.

Q. What is an algorithm?

A. Solving a problem by breaking a task down into a series of specific steps in a specific order is called an algorithm.

Q. What is block coding?

A. Block coding is an easy way to code that looks like a puzzle.

Q. What is Java script?

A. It is one of the programming languages.

Q. What is a string or syntax and what you learned about it in this lesson?

A string that is a line of text that is given to the Agent. I cannot put spaces there, I need to put underscores between the words.

Q. Take a picture of all your code and paste it here.

Answers may vary.

Q. Take a picture of your agent and paste it here.

A. Answers may vary.