

MINECRAFT
EDUCATION EDITION

CODING FUNDAMENTALS

Mercury and Venus

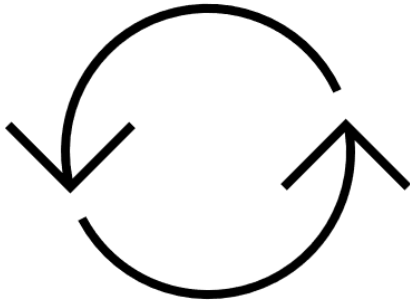
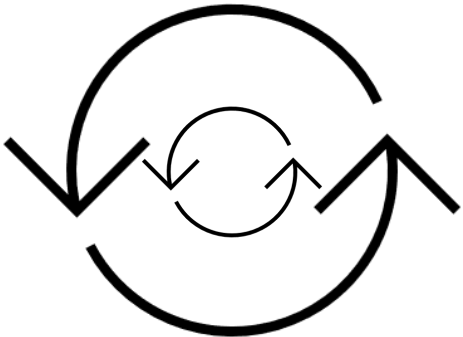
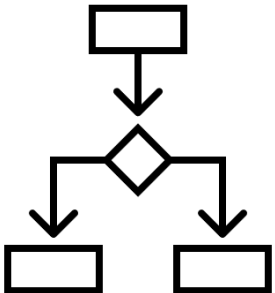


WHAT WE WILL LEARN TODAY?

- I will follow coding instructions to solve puzzles without visual Minecraft support.
- I will use operators, conditionals, and while loops in my programs.
- I will test and debug my code.
- I will embrace a coding mindset.

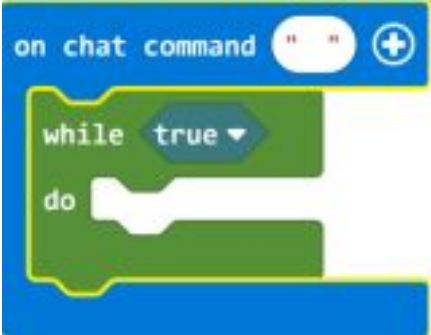

IMPORTANT VOCABULARY

There are some important things for us to understand before we begin playing- let's review some concepts first!

Loop	Nested Loop	Conditional
<p>a structure that repeats a set of instructions (algorithms) until it is told to stop</p> 	<p>a loop within a loop</p> 	<p>an action that occurs if something specific happens</p> 



CODING BLOCKS

These are coding blocks we will focus on using today...

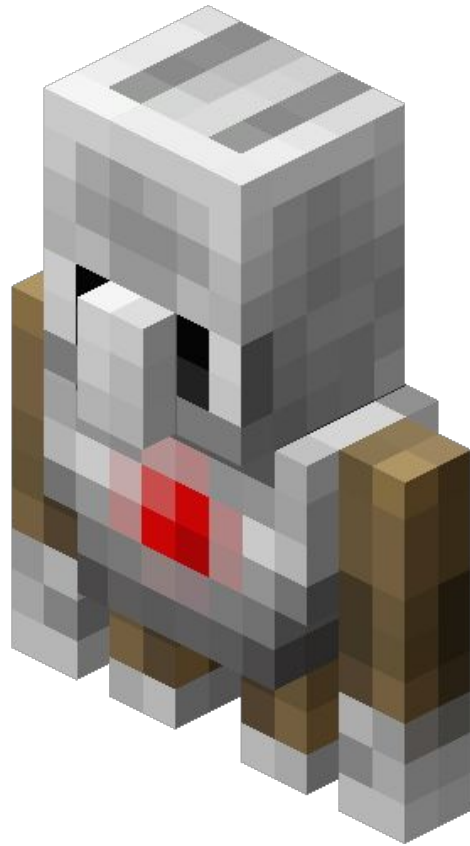
While Loop	Agent Detect
<p data-bbox="318 554 1174 682">repeats the code if a defined condition is met</p>  <p>The image shows a Scratch 'on chat command' block (blue) with a plus sign icon. Inside the block, there is a green 'while true' loop block. The 'do' section of the loop is currently empty.</p>	<p data-bbox="1332 554 2415 689">detects if there is a block next to the Agent in a defined direction</p>  <p>The image shows a Scratch 'agent detect' block (orange and red) with a blue border. It has three dropdown menus: 'agent detect', 'block', and 'forward'.</p>

CODING BLOCKS

These are coding blocks we will focus on using today...

If Then	Agent Detect
<p data-bbox="231 554 1263 611">runs code when a condition is met</p>  <p data-bbox="547 658 1003 1012">A Scratch coding block for 'on chat command' with a plus sign in the top right. It contains an 'if true then' block with a plus sign in the bottom left, and a blank block with a plus sign in the bottom left.</p>	<p data-bbox="1365 554 2390 686">runs a specific code depending on whether a condition is met or not</p>  <p data-bbox="1704 715 2084 1129">A Scratch coding block for 'on chat command' with a plus sign in the top right. It contains an 'if true then' block with a plus sign in the bottom left, an 'else' block with a minus sign in the bottom right, and a blank block with a plus sign in the bottom left. The entire block is highlighted with a yellow border.</p>

GOAL FOR THE DAY



Welcome Space Explorers!

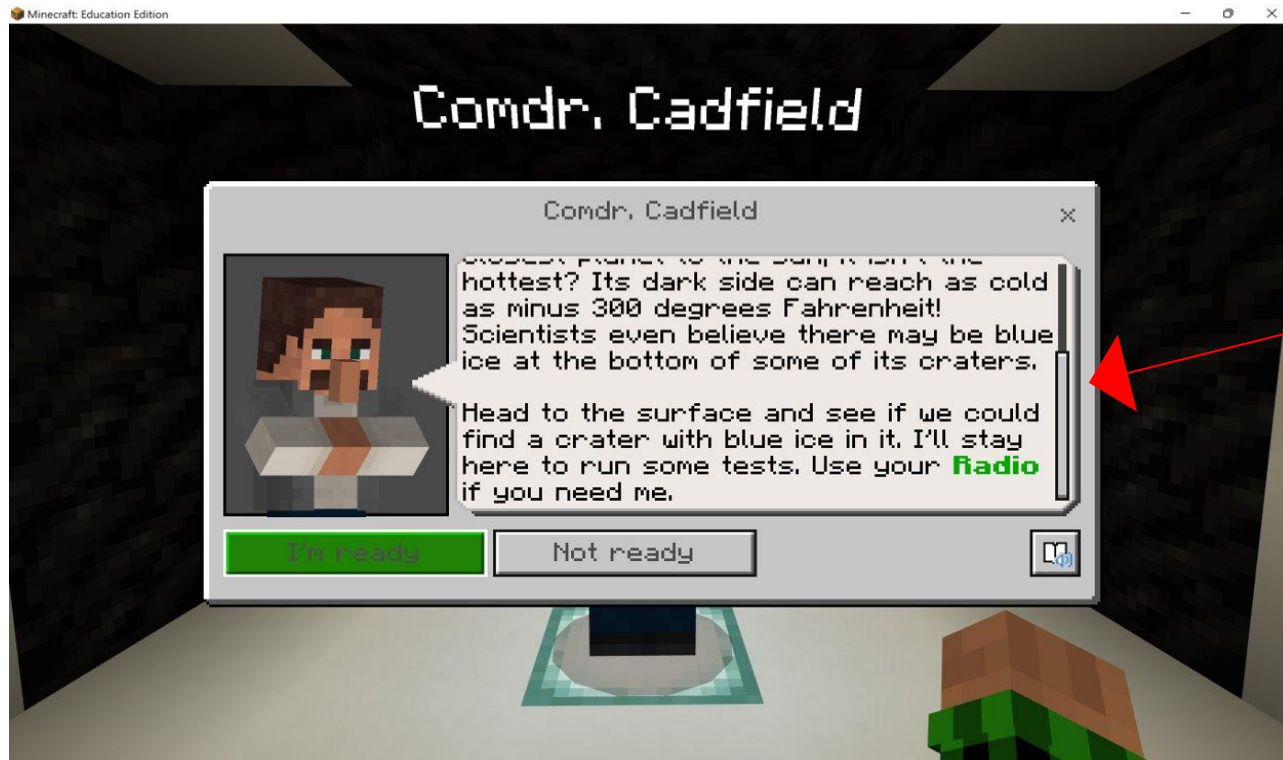
Today, we will explore Mercury and Venus. During our exploration, we will use the Agent to help us collect materials from each of these planets. Because of these inhospitable environments, only the Agent will be able to explore, collect, and deliver our materials.

MERCURY AND VENUS



This is your spawn point, the location where you begin game play.

TALK TO COMMANDER CADFIELD



This is the pop-up screen we will see on our screen.

When there is a longer message, we will see a bar on the side. We will need to slide the bar down to read the rest of the message.

After reading/listening to the message, click the "I'm ready" button.

Remember, you can use the Immersive Reader feature if you need help reading the words.

1ST STOP: MERCURY



We have arrived on Mercury, and we need to locate a crater to gather some materials for research.

Mercury's atmosphere is inhospitable to humans so we must use our Agent to explore, collect, and deliver our specimens. It will be vital for us to use the **While Loop** because we will not be able to count blocks from the viewing platform.

THINK ABOUT THE CODE

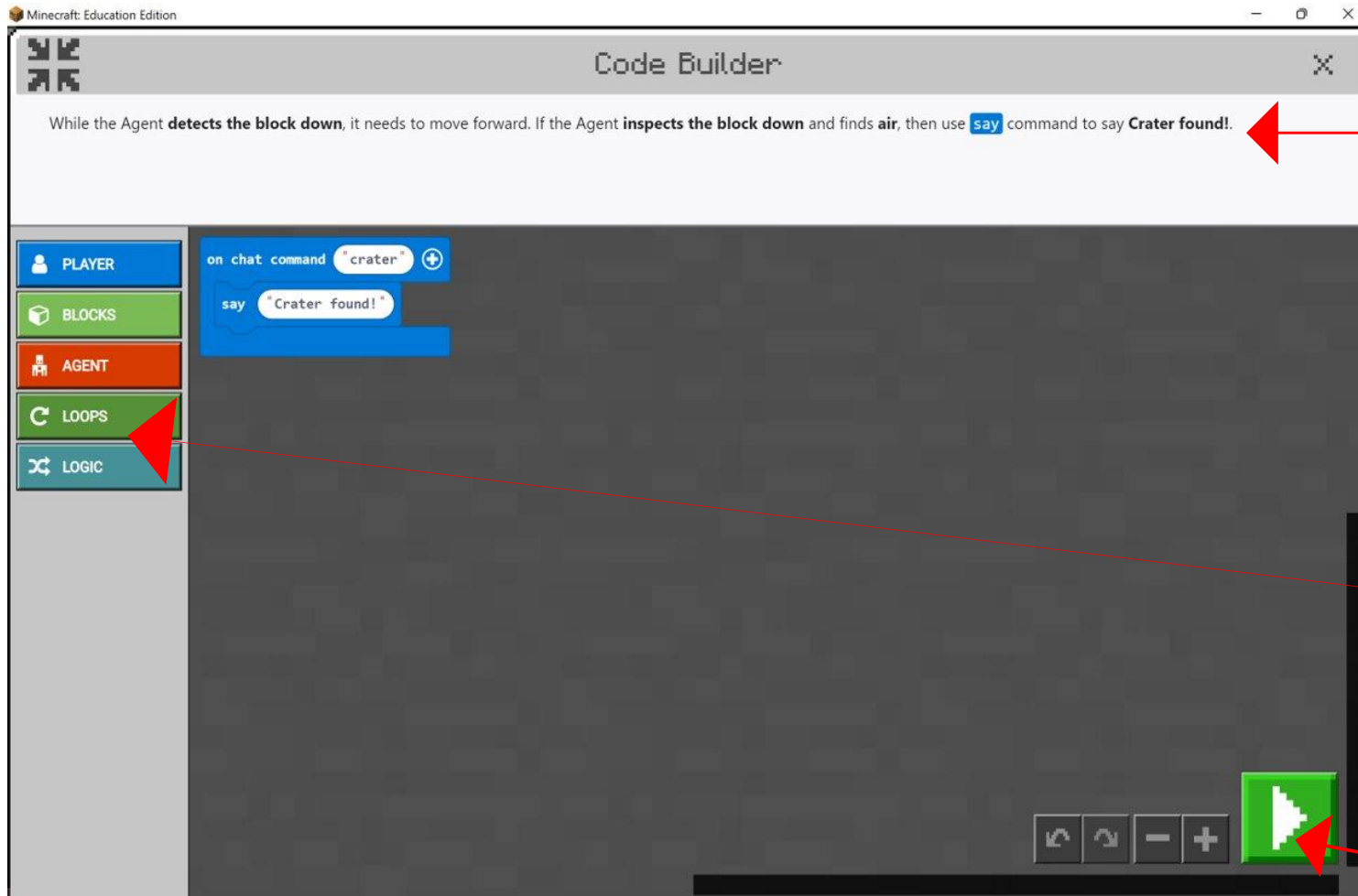


The goal is to reach the crater on the other side of this area by moving forward, but we do not know how far it is... we must use our detect block! What else should we use?



This is an areal perspective of the area. Consider how to create the program based on this layout.

CODING ACTIVITY #1



Step 1: Read the coding task.

Step 2: Use the MakeCode blocks from your toolbox. You will drag and drop them into the coding canvas.

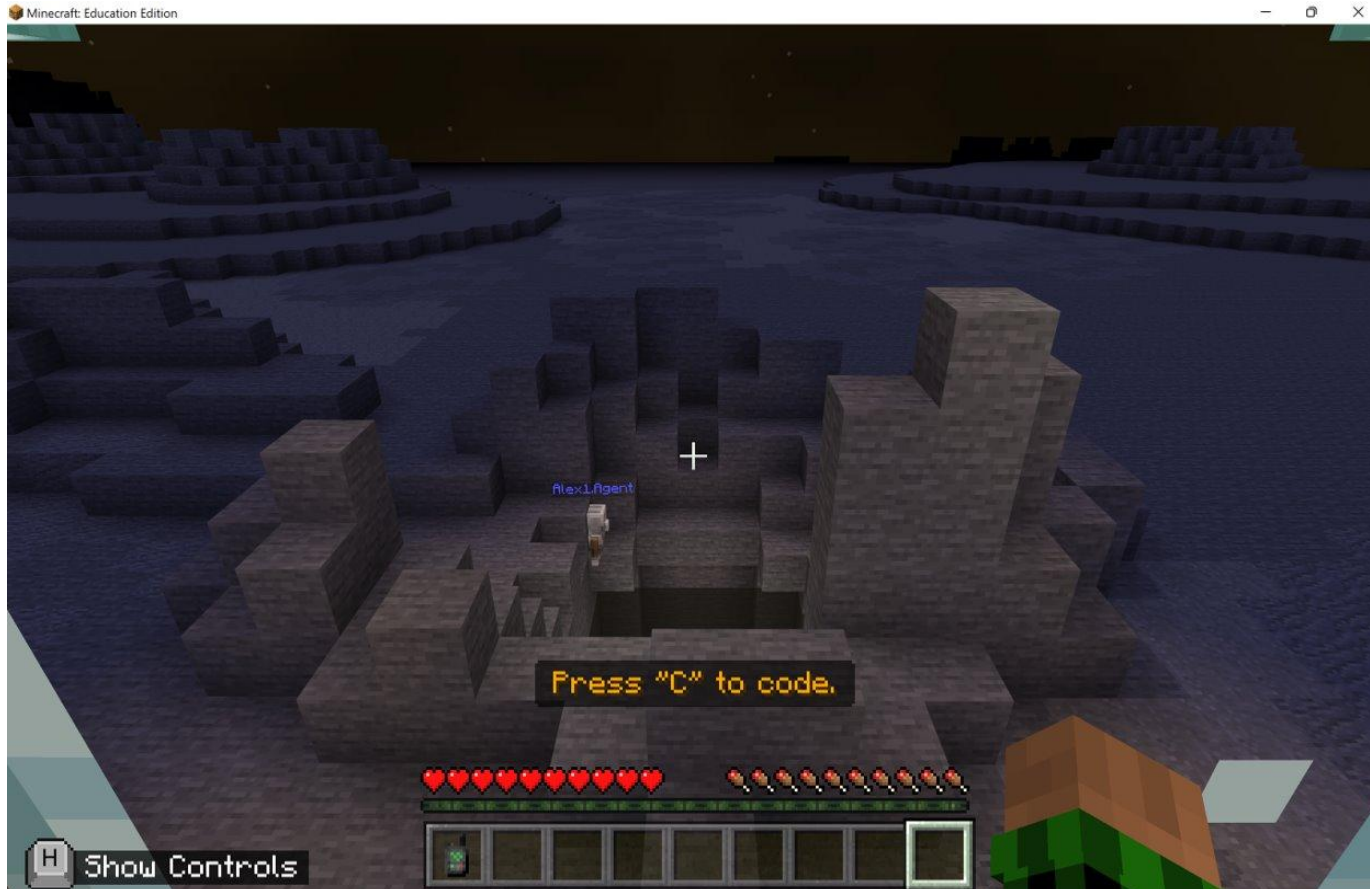
- What blocks do we need?
- What order should the blocks be in?

Step 3: Press the green start arrow to test your code.

TEST YOUR CODE



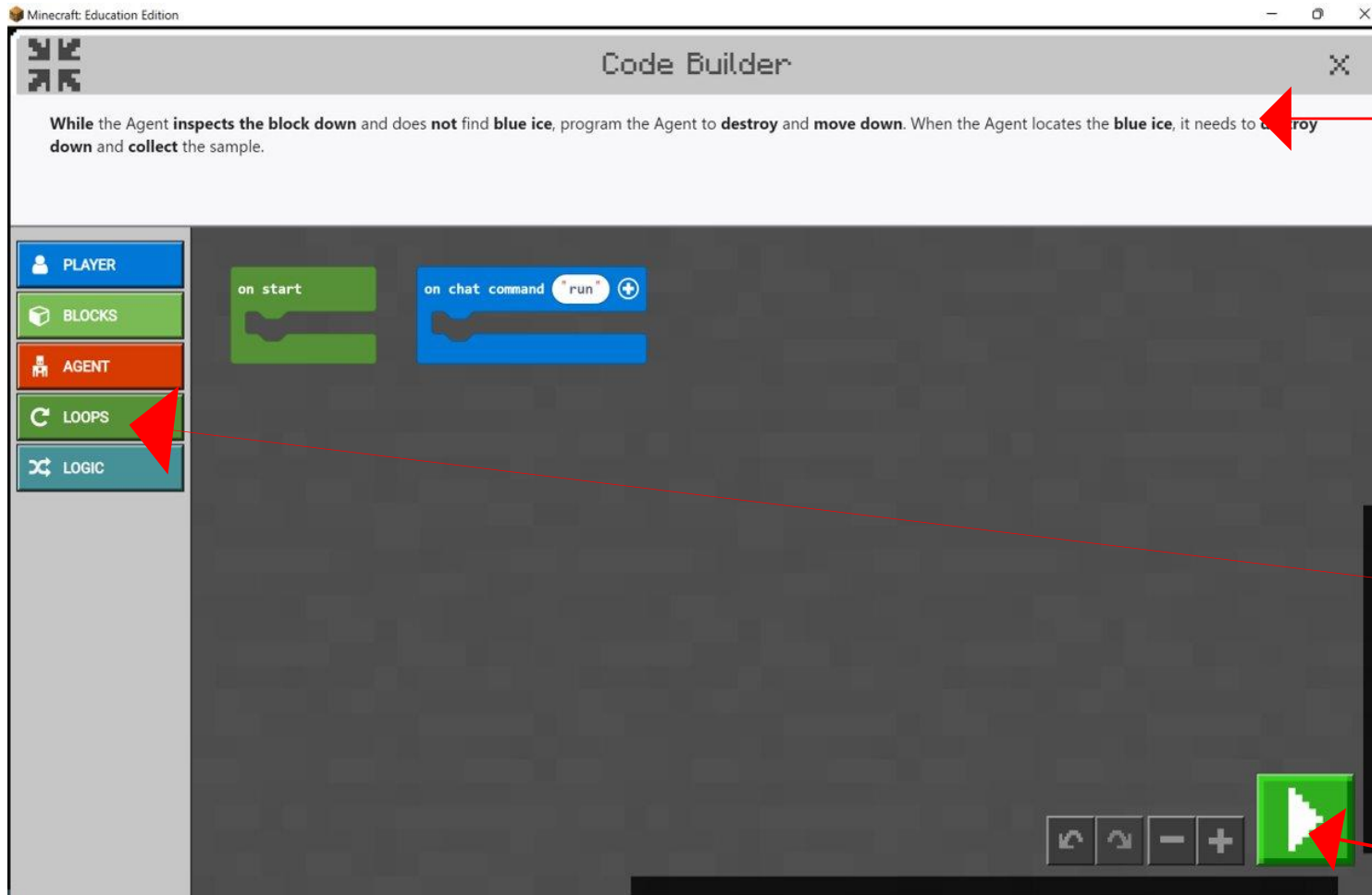
CODING ACTIVITY #2



It is time to find some samples!

Program the Agent to inspect, destroy, and collect some samples of the Blue Ice. The Agent will need to inspect downward... The Agent will go straight down into the crater using a While Loop. We need the While Loop because we do not know how deep down the Agent needs to move.

CODING ACTIVITY #2



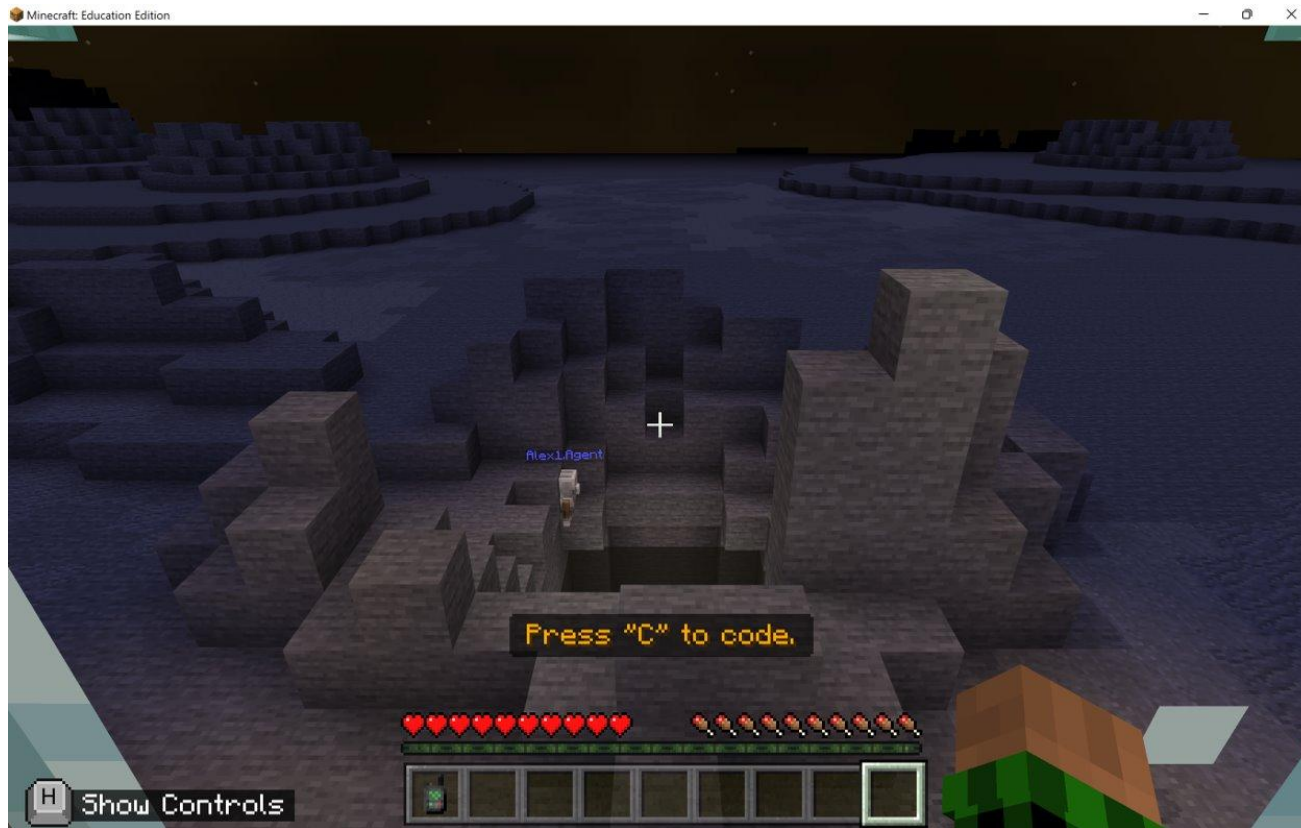
Step 1: Read the coding task.

Step 2: Use the MakeCode blocks from your toolbox. You will drag and drop them into the coding canvas.

- What blocks do we need?
- What order should the blocks be in?

Step 3: Press the green start arrow to test your code.

TEST YOUR CODE



DIGITIZE THE BLOCK



Walk over to
Commander Cadfield for
directions on how to
digitize the block.

TALK TO COMDR. CADFIELD



This is the pop-up screen we will see on our screen.

When there is a longer message, we will see a bar on the side. We will need to slide the bar down to read the rest of the message.

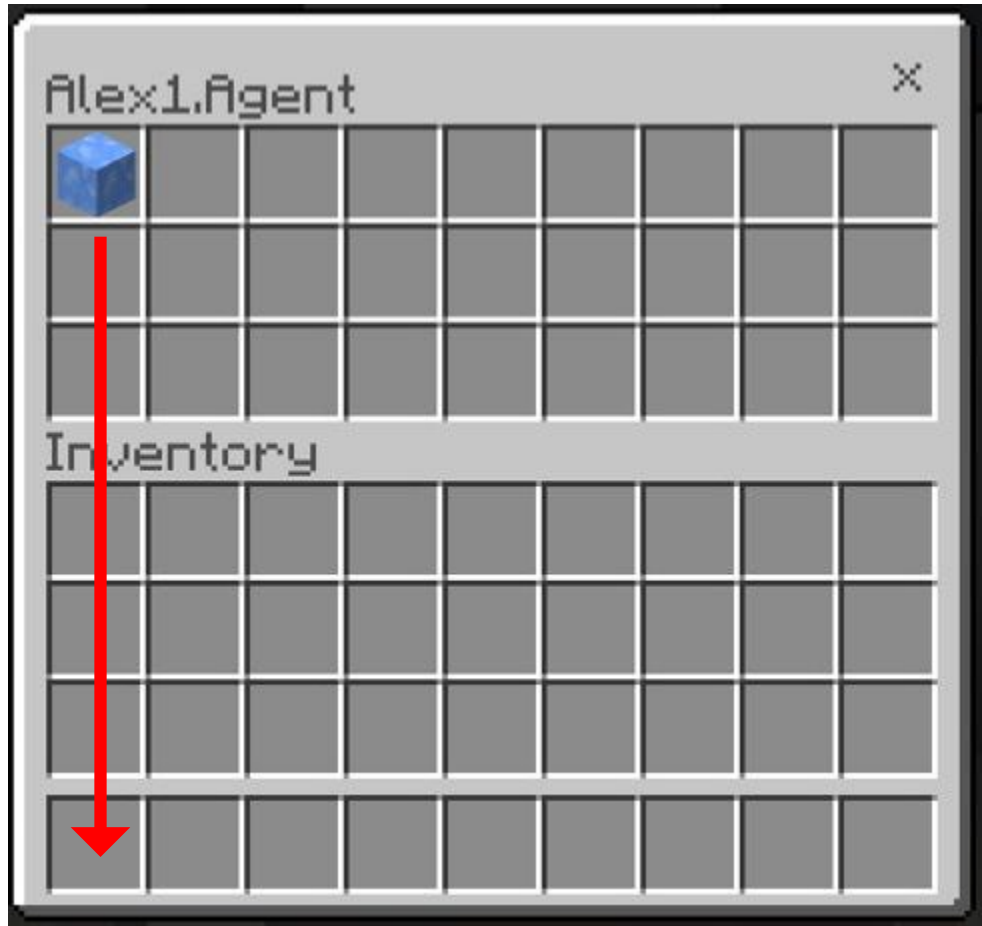
Remember, you can use the Immersive Reader feature if you need help reading the words.

STEP 1: WALK TO THE AGENT



Walk over the Agent.
Click on the Agent to see
the Agent's inventory.

STEP 2: MOVE THE BLUE ICE



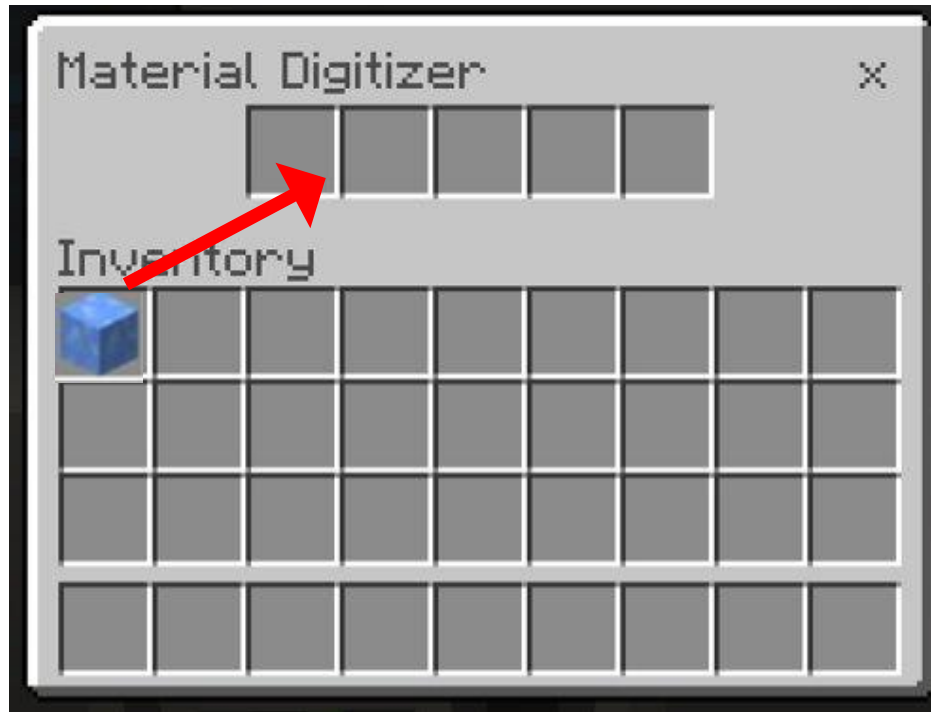
Click on the Blue Ice;
Drag and drop the Blue Ice
into a slot into your hotbar.

STEP 3: CLICK ON THE DIGITIZER



Click on the Digitizer, which is right next to the Agent.

STEP 4: MOVE THE BLUE ICE

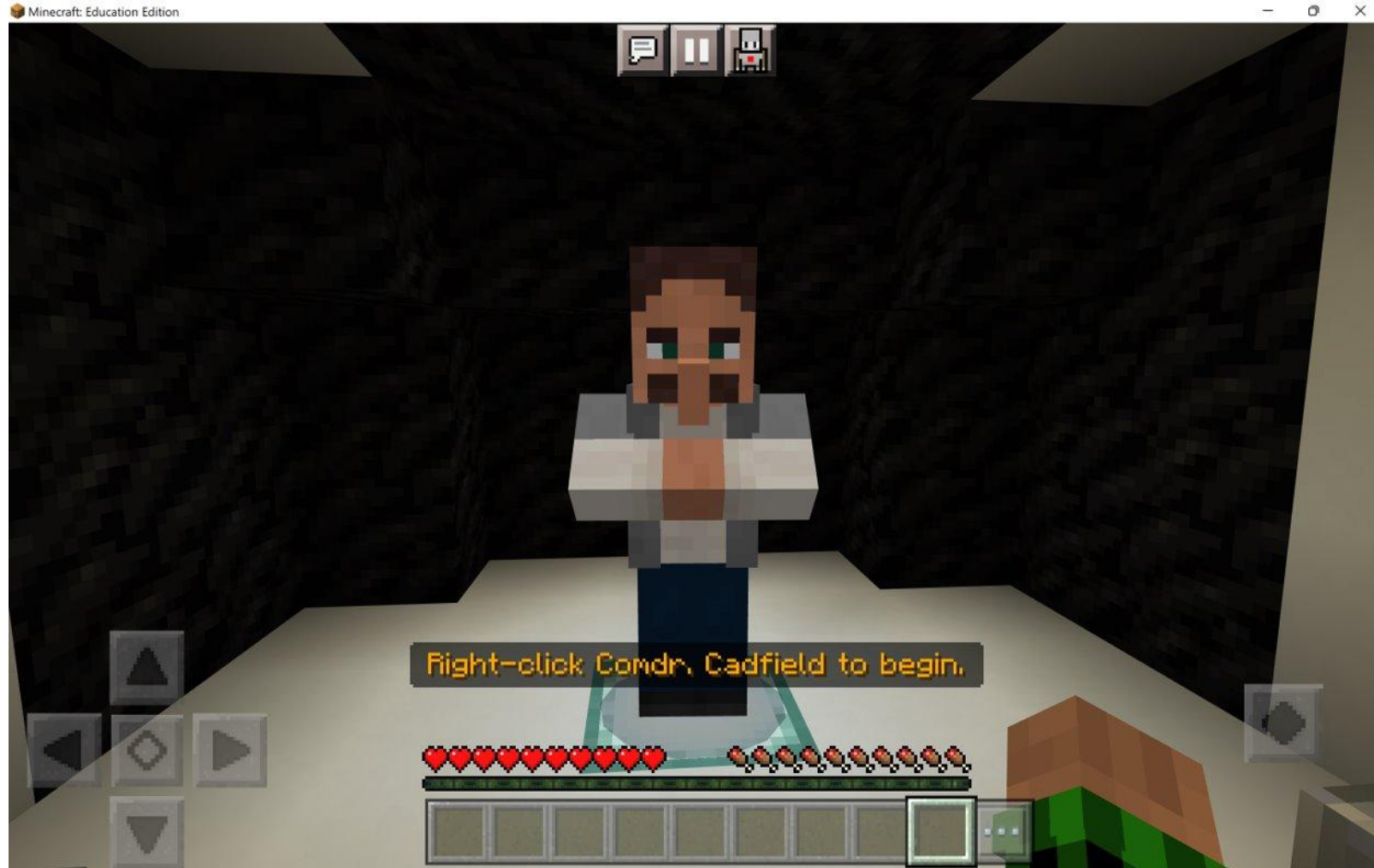


Click on the Blue Ice;
Drag and drop the Blue Ice
into a slot into the Material
Digitizer.

SUCCESS!



WALK OVER TO COMDR. CADFIELD



TALK TO COMDR. CADFIELD



Remember, you can use the Immersive Reader feature if you need help reading the words.

This is the pop-up screen we will see on our screen.

When there is a longer message, we will see a bar on the side. We will need to slide the bar down to read the rest of the message.

After reading/listening to the message, click the "I'm ready" button.

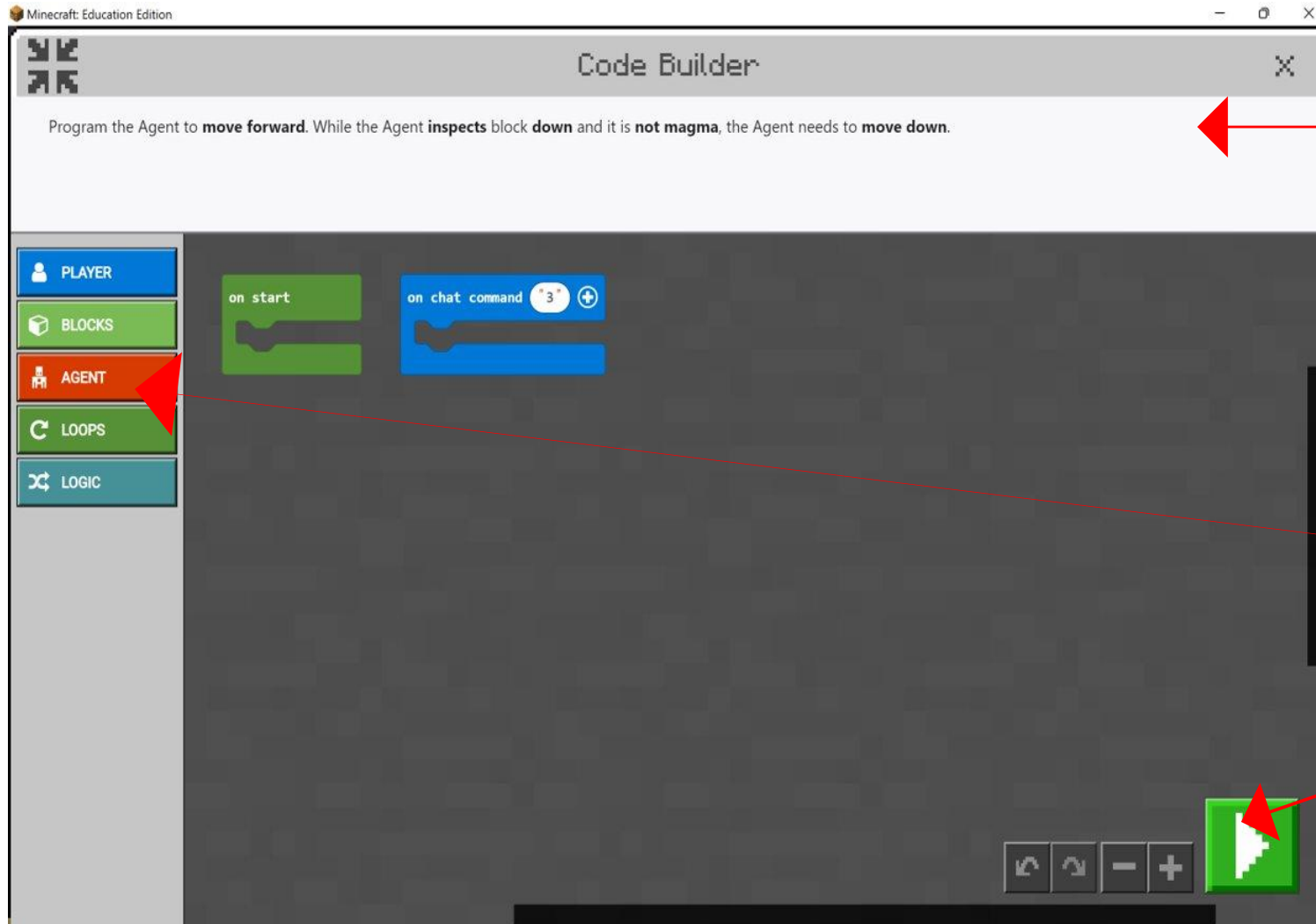
CODING ACTIVITY #3



Welcome to Venus!

The ship is in a habitable zone until the surface can be found. You need to program the Agent to reach magma.

CODING ACTIVITY #3



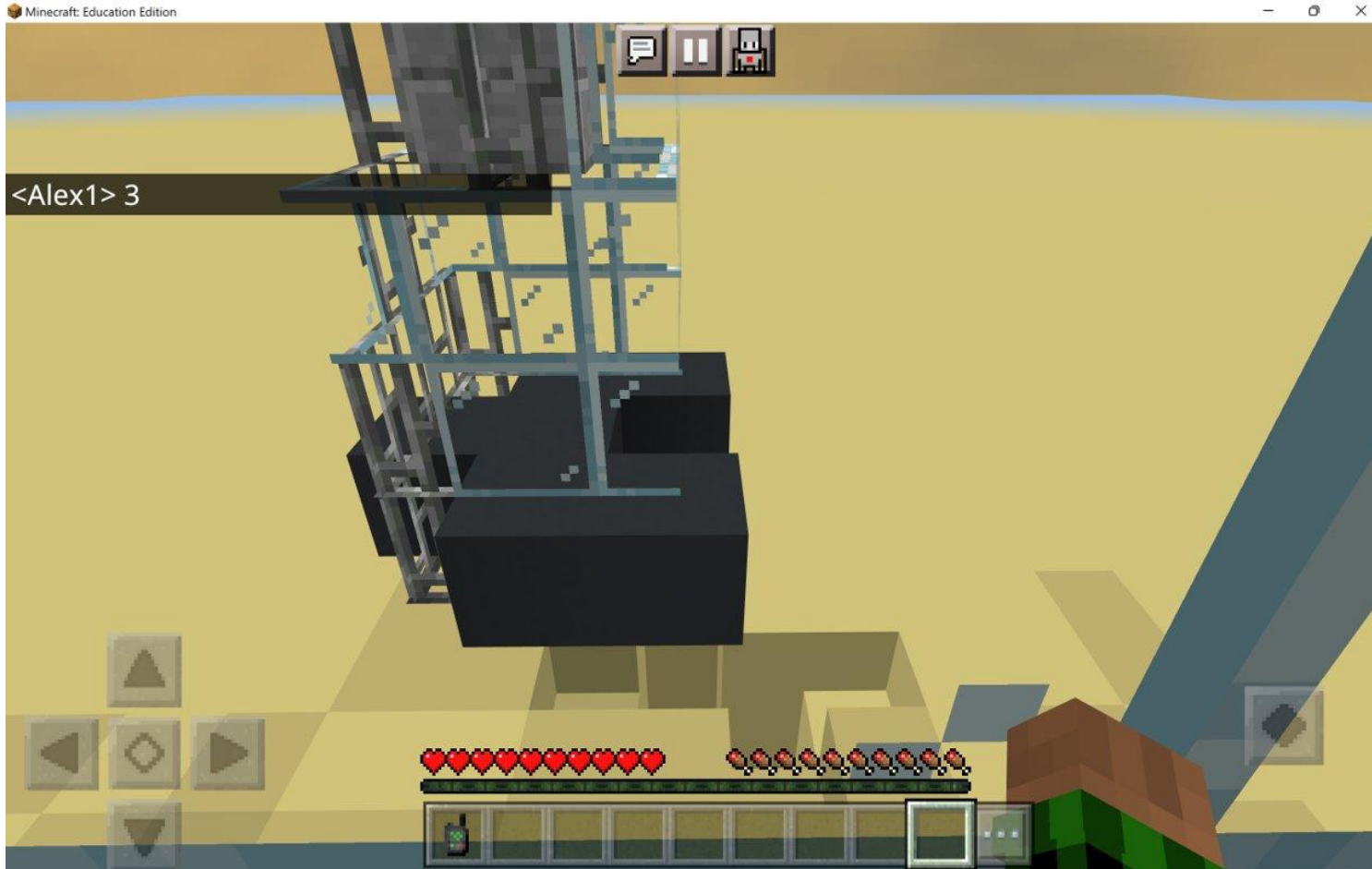
Step 1: Read the coding task.

Step 2: Use the MakeCode blocks from your toolbox. You will drag and drop them into the coding canvas.

- What blocks do we need?
- What order should the blocks be in?

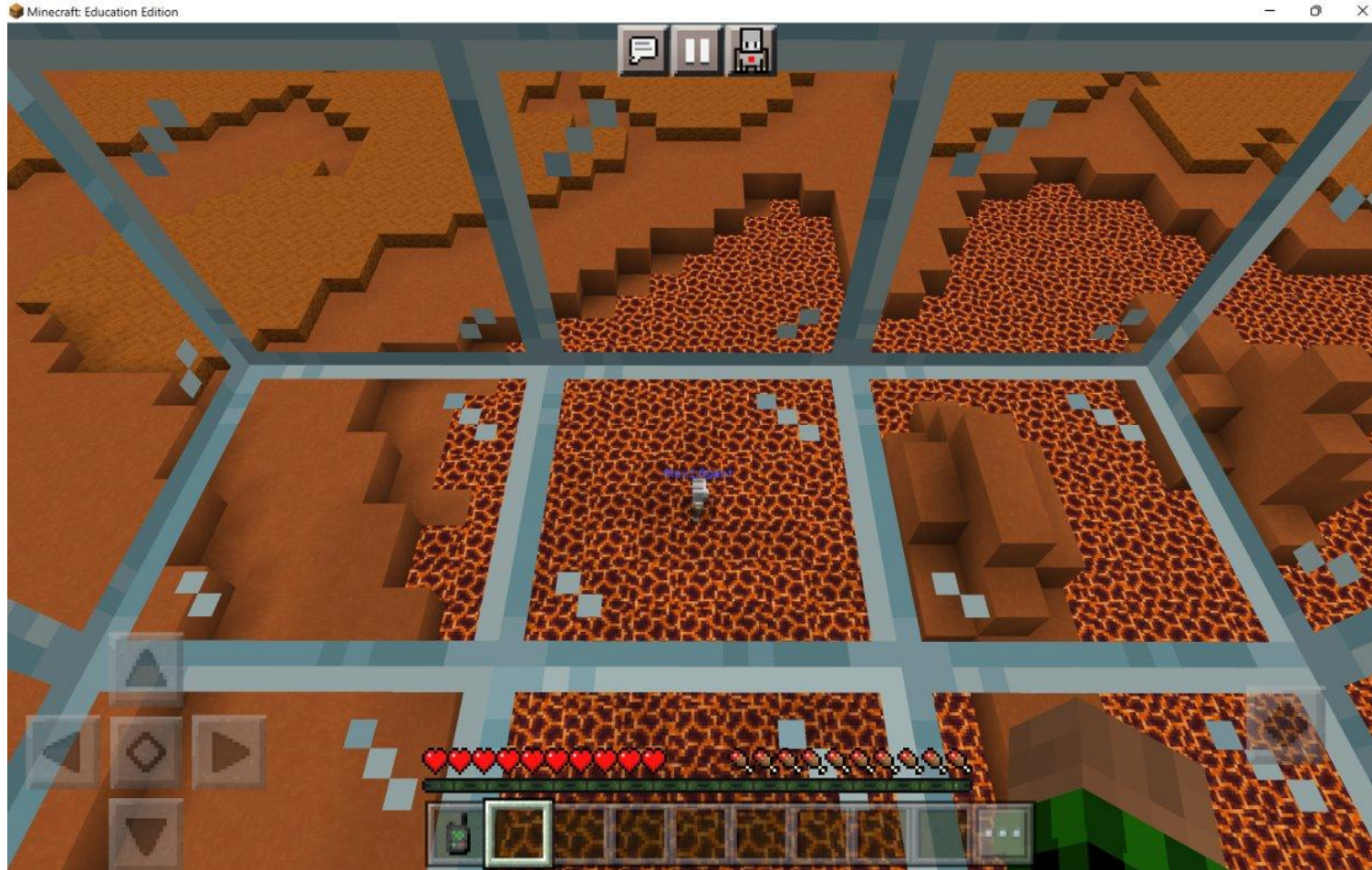
Step 3: Press the green start arrow to test your code.

TEST YOUR CODE



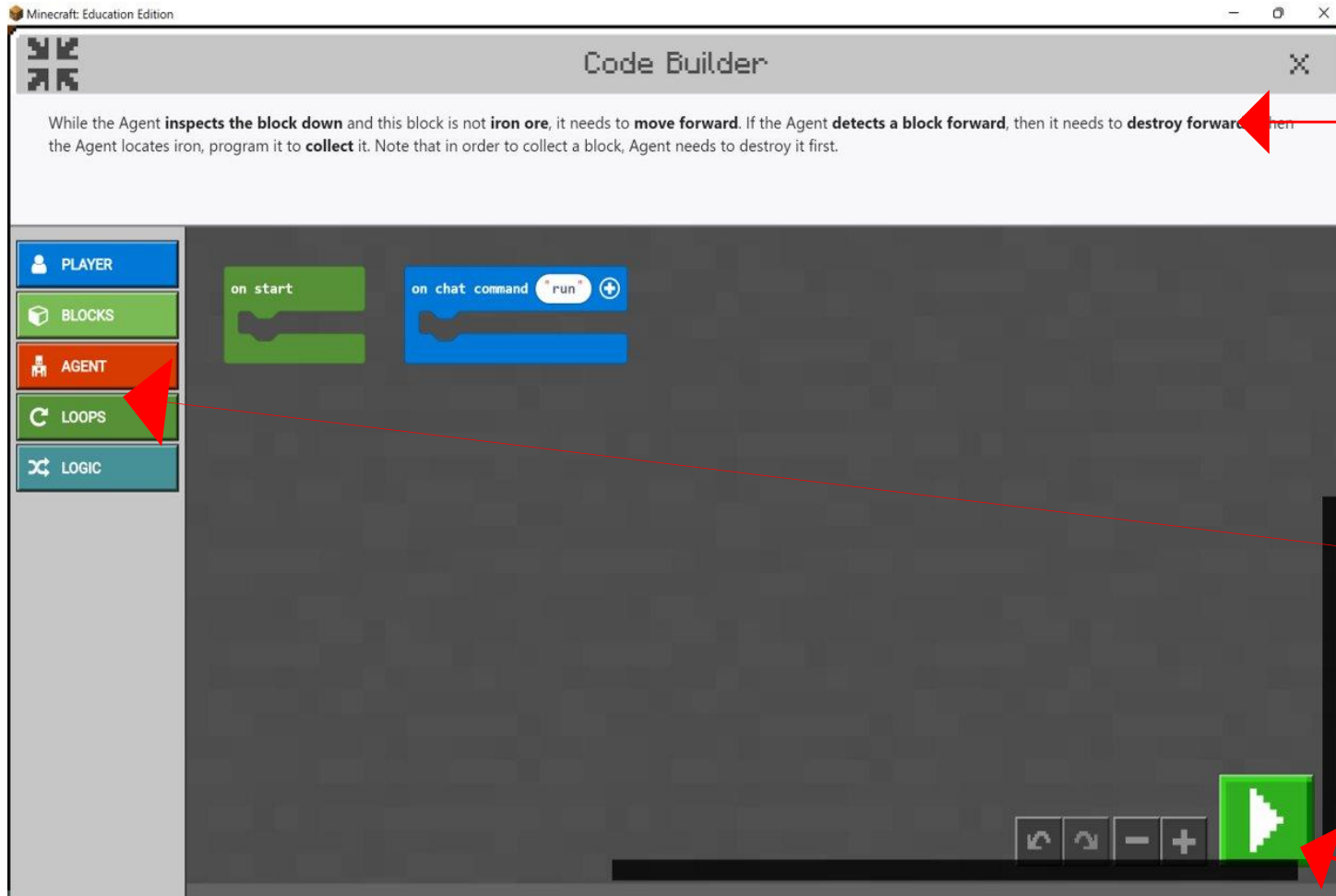
If your code runs correctly, you will see the "Activity Complete" message.

CODING ACTIVITY #4



The Agent has located magma blocks that need to be crossed to get to the iron ore on the shore. Once again, since you cannot count blocks, you will need to use a conditional loop and the Agent inspect block.

CODING ACTIVITY #4



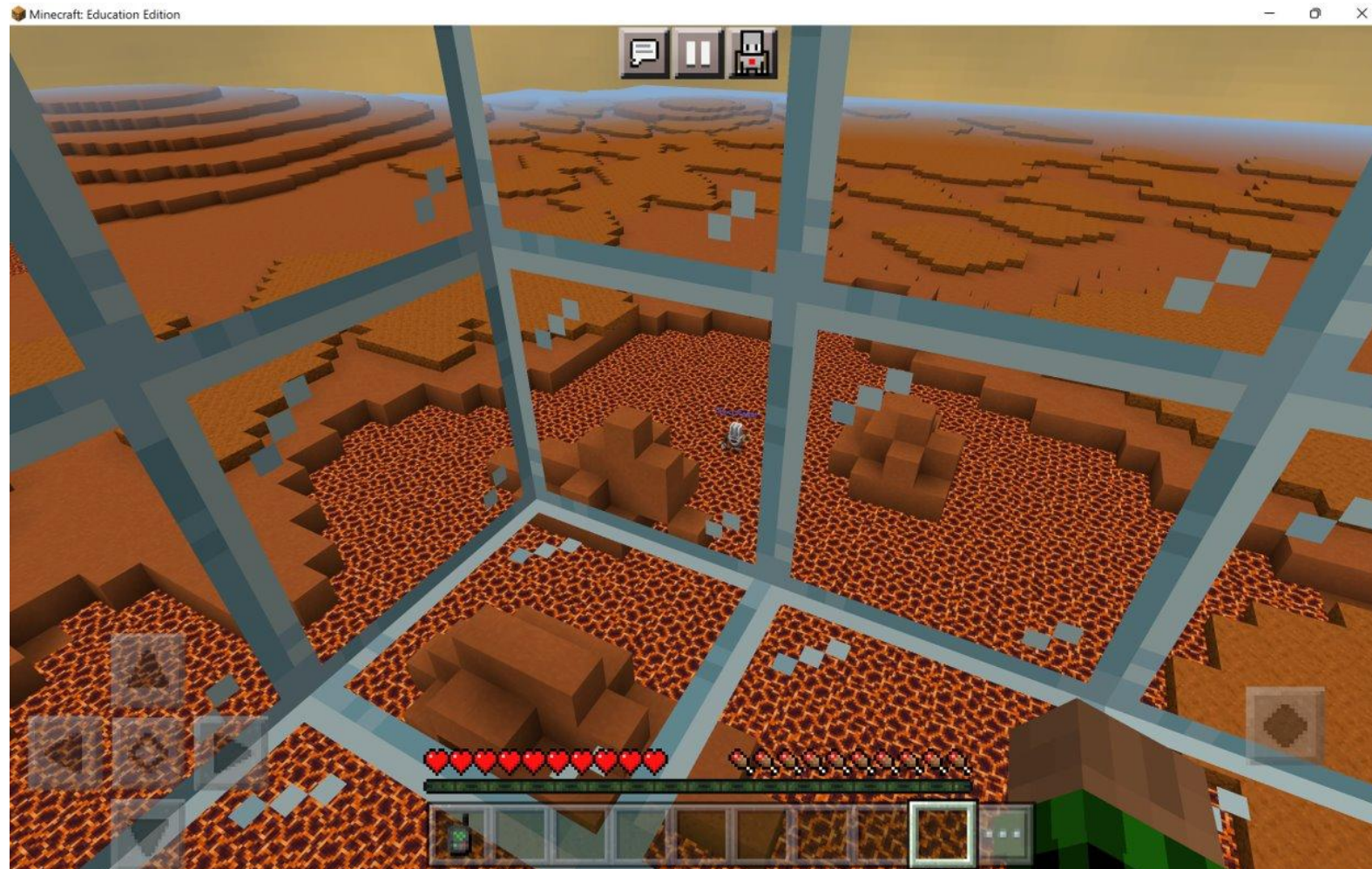
Step 1: Read the coding task.

Step 2: Use the MakeCode blocks from your toolbox. You will drag and drop them into the coding canvas.

- What blocks do we need?
- What order should the blocks be in?

Step 3: Press the green start arrow to test your code.

TEST YOUR CODE



DIGITIZE THE BLOCK



Follow the same steps to digitize the block from Venus.

1. Click on the Agent; move the block from the inventory to the hotbar.
2. Click on the Digitizer; move the block from your hotbar into the Material Digitizer.

SUCCESS!



TALK TO COMDR. CADFIELD



This is the pop-up screen we will see on our screen.

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BONUS ACTIVITY



Move into the
holographic
simulator!

BONUS ACTIVITY



Practice using your Agent in the simulation room. Try out some of the coding skills you have been learning.

Recap

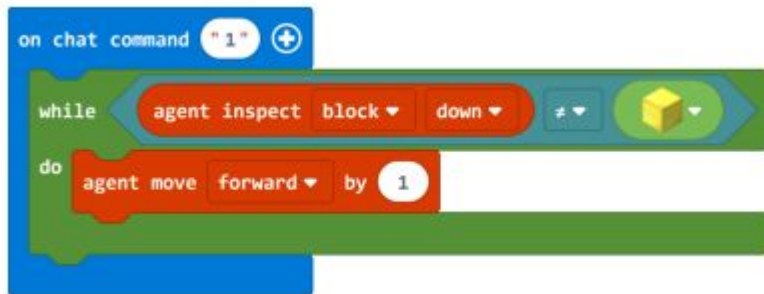
What you've done today:

- Followed coding instructions to solve puzzles without visual Minecraft support.
- Used the coding concepts of operators, loops, nested loops, and conditionals to complete tasks.
- Tested and debugged my code.
- Embraced a coding mindset!

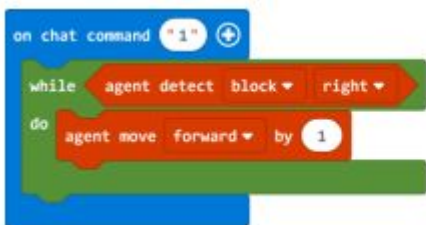


REFLECTION

- Can you read this coding snippet and explain in your own words what it does?

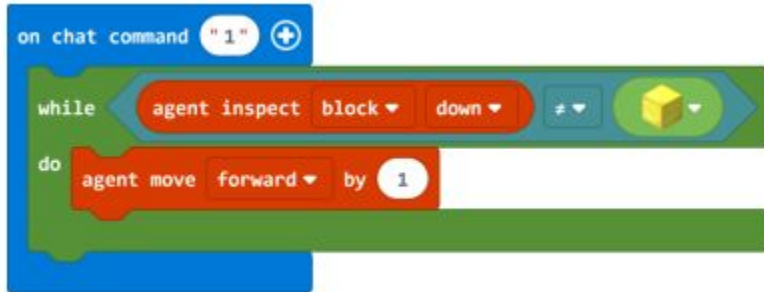


- What is the difference between these two coding snippets?



REFLECTION

- Do you know how many steps forward does the Agent needs to move forward?



- Why are “while loops” useful in coding?