MINECRAFT EDUCATION EDITION

Educator Guide

Block 2 – Lesson 5
45 minutes
Single Student

Uranus' Rings and Neptune's Moon Triton: Finding the Correct Code

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THEME OVERVIEW

Tell the Students: We have now arrived at the ice giant Uranus. Uranus is the seventh planet from the Sun and just like Jupiter, it has rings. Although Uranus has nine rings like Saturn they are different in appearance and what they are made of. We will be heading to one of the moons in Uranus' rings to look for some ore to add to our collection.

LESSON OBJECTIVE

Building upon Debugging in some of our previous lessons, this lesson will focus on evaluating the code and testing it to determine which coding snippet is correct.

THINGS TO KEEP IN MIND

- This lesson is different in format in comparison to other lessons. It's flipped. The majority of the lesson students will be reading the code and evaluating it and then trying it out in game.
- Remind students there will be only 1 attempt for them to try the code out in game, so all the preparation needs to happen prior to the in-game time.

KEYWORDS

Debugging – the process of finding and removing errors in code.
Persistence – Not giving up. Persistence works best when you try things many different ways, many different times.
Attention to Detail – Ability to achieve accuracy in completing a task

START OF LESSON PROCEDURE

Number of Activities: 2
Optional Activity: 1

INTRODUCTION AND LEAD-IN: 5 minutes

Lead-in:

This lesson will be focusing on fine-tuning what students have been working on in this block: handling details, conditionals, and loops. Because they are handling activities that require a lot of thought and planning and the Agent

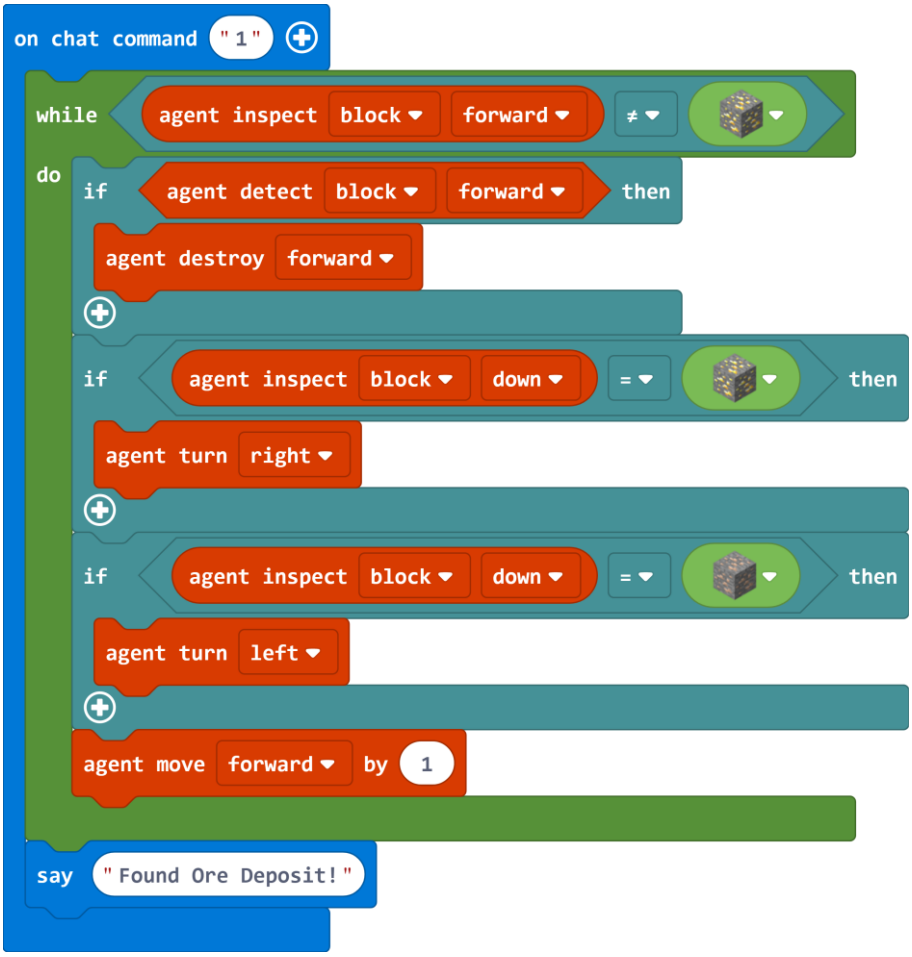
will be doing multiple jobs all at once, attenditon to detail is vital. The focus of this lesson is for students to find the code snippet that will achieve the objective.

CODING ACTIVITIES: 30 minutes

It is important to communicate to students that attention to detail and persistence make up a large portion of coding exercise. Just like in other subjects making sure everything is correct and doing what it is supposed to be doing is our end goal. All three of the scenarios given to the students contain code that should be familiar to the students. They are required to "read" each code snippet and write out what the code is supposed to do. They can also draw the solutions as they see them.

Split students in groups of 3-4 and distribute the handout. Students would need to read the code, write what the code is trying to achieve and draw what the Agent movement. There are 3 code snippets, only 2 of them are used in-game, the third one is not applicable to the activities. If students correctly desipher what each code snippet does, they should not have an issue selecting the correct code snippet to execute in-game.

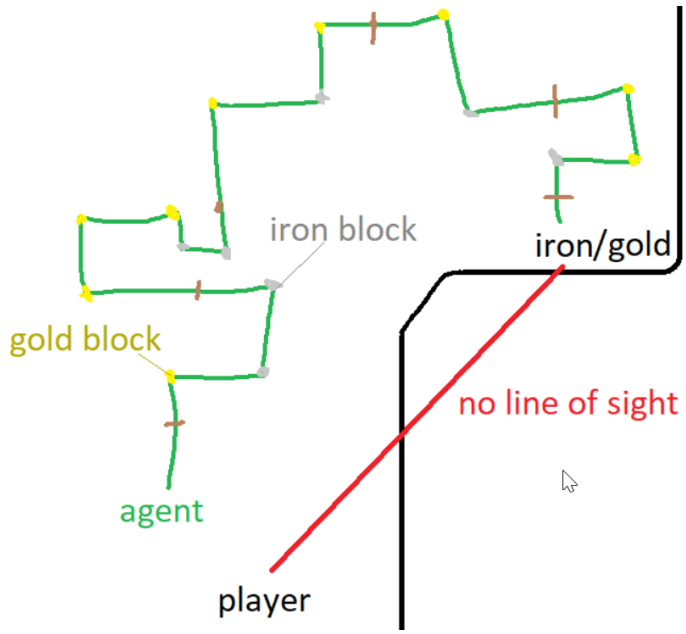
These are the code snippets:



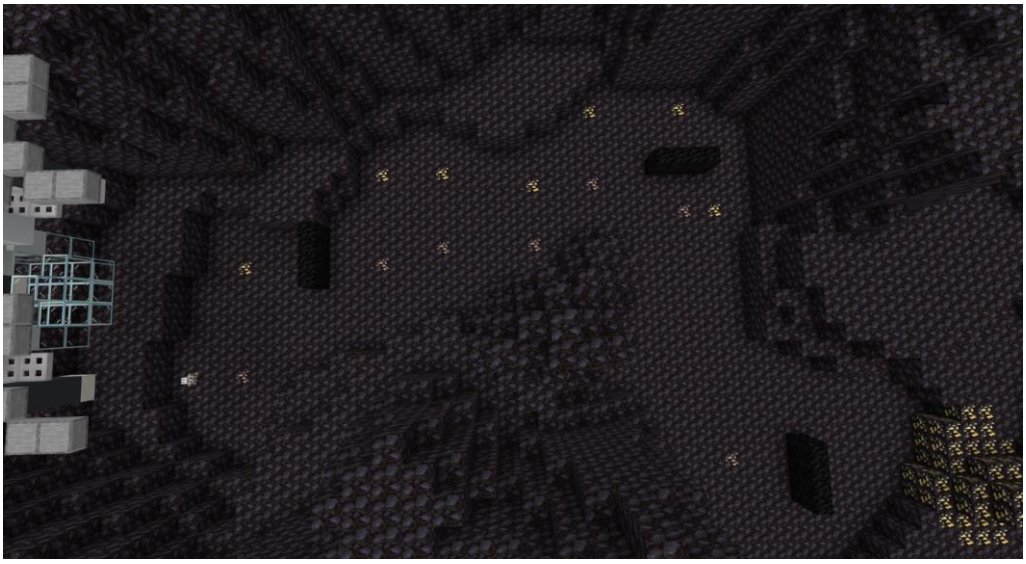
Possible explanation:

While inspecting for a gold ore block forward and not finding it, if the Agent detects a block forward, then it needs to to destroy it. If the Agent locates a block of gold ore underneath, it needs to turn right, and if the Agent detects an iron ore block underneath, it needs to turn left, otherwise it needs to move forward until it finds Ore Deposit.

A sample drawing can look like this:



The actual screenshot in-game:



Code snippet 2:

```
on chat command "2"
  repeat 28 times
  do
    if agent detect block forward or agent detect block left or agent detect block right then
      agent destroy forward
      agent destroy left
      agent destroy right
      agent collect all
    agent move forward by 1
  agent turn right
  repeat 8 times
  do
    if agent detect block forward or agent detect block left or agent detect block right then
      agent destroy forward
      agent destroy left
      agent destroy right
      agent collect all
    agent move forward by 1
  agent turn right
  repeat 24 times
  do
    if agent detect block forward or agent detect block left or agent detect block right then
      agent destroy forward
      agent destroy left
      agent destroy right
      agent collect all
    agent move forward by 1
```

Possible explanation:

If the Agent detects a block forward or a block left or a block right, then it needs to destroy forward, left and right and collect all the materials. Then the Agent needs to move forward by 1. These actions will be repeated 28 times.

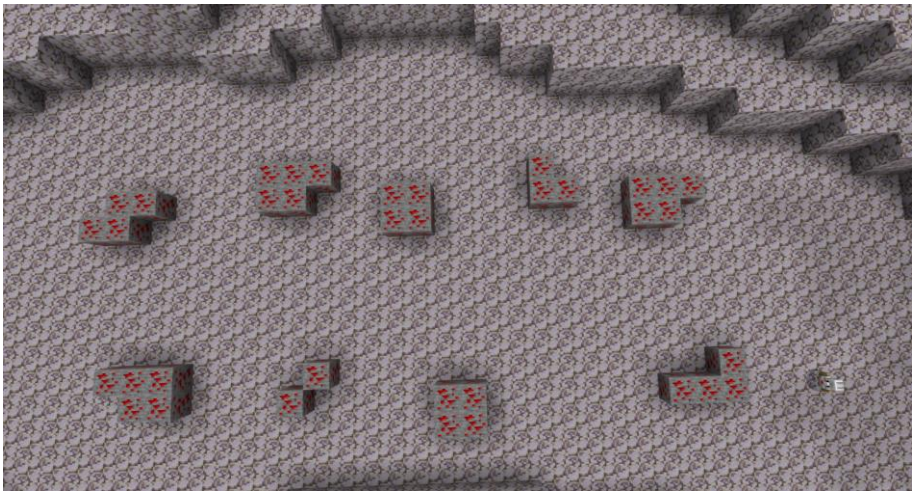
After that the Agent needs to turn right.

If the Agent detects a block forward or left or right, it needs to destroy blocks forward, left and right and collect all. Then the Agent needs to move forward by 1. These actions will be repeated 8 times.

After that the Agent needs to turn right.

If the Agent detects a block forward or left or right, it needs to destroy blocks forward, left and right and collect all. Then the Agent needs to move forward by 1. These actions will be repeated 24 times.

The actual in-game screenshot:



Code Snippet 3:

```
on chat command "incorrect"
  repeat 10 times
  do
    repeat 4 times
    do
      repeat 4 times
      do
        agent move forward by 1
        agent set block or item [wooden planks] count 1 in slot 1
        agent place down
      agent turn right
    agent move up by 1
```

This code snippet is incorrect.

Activity 1: Uranus's rings

Students will find themselves on one of the many moons of Uranus. They will see a field of different types of ore in front of them. They have been

provided with three different coding scenarios. They must select the correct scenario in order for the Agent to retrieve the ore. Remind students that in the game, they get only one chance. If they get it wrong, they will have to reset and start from the beginning.

Activity 2: Neptune's Moon Triton

Like Uranus and other planets, Neptune does not have a solid surface. Because of that, students will land on its largest moon, Triton. While extremely cold, scientists on Earth have detected its atmosphere is slowly growing warmer, but don't know why. Students will head there and see what they will find.

LESSON CONCLUSION

Upon completion of this lesson students should be able to answer the following questions:

1. Q.: Why is Sequencing important?
   A.: If sequencing is wrong, the program won't run correctly and the result will be unexpected.
2. Q.: What is a Persistence?
   A.: Not giving up. Persistence works best when you try things many different ways, many different times.
3. Q.: What was your favorite planet to visit over the course of this block?
   A.: Answers will vary.
4. Q.: Why is it important to understand the code before running it in-game?
   A.: Answers will vary. It can cause irreparable damage to the game.

EDUCATION STANDARDS - LESSON 4

CSTA K-12	
1A-AP-12	Develop plans that describe a sequence of events, goals, and expected outcomes.
1B-AP-17	Describe choices made during program development using code comments, presentations, and demonstrations.
1B-AP-11	Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
ISTE	
3D	Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.
4A	Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
5C	Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.