



# MINECRAFT

## EDUCATION EDITION

### Educator Guide

Single Student

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## Coding Concept: **CONDITIONAL LOOPS**

**Conditional Loops** are a way for tasks to be repeated as long as a certain aspect or condition is true. They are important because they allow tasks to be repeated until complete within a program without manually writing each repeated step or process.

For more information on **conditional loops**, see <https://curriculum.code.org/csf-1718/coursed/12/>.

**EDUCATION.MINECRAFT.NET**

### Conditional Loops in Minecraft:

In Minecraft, conditional loops can be used by the agent to detect the object relative to its position and use that detection to determine what needs to happen next. In Minecraft the ability to farm is an essential element of survival and thriving in the game and allows the perfect demonstration and practice for conditional loops use. By coding the agent to farm, the learner is free to do other survival tasks while still collecting needed resources.

## OVERVIEW

These learning activities are designed to provide the learner with flexibility and choice in his/her learning.

1. The learner will be introduced to three tutorials that are at three levels of difficulty (Novice, Intermediate and Expert) which are followed by an educational activity where he/she can apply coding skills.
2. Within each tutorial, the learner will have the option of selecting a coding language (Blocks, Javascript or Python).

The learner may choose a tutorial at his/her appropriate difficulty level and language OR choose to complete all tutorials and the educational activity. It will take approximately an hour to complete all activities.

## LESSON STRUCTURE

**Novice:** Agent Destroy Passage

**Intermediate:** Agent Build Bridge

**Expert:** Spiral Activity

### Educational Application:

The learner is free to engage with activities in Block coding, Javascript and/or Python and does not need to complete all the activities.

The learner will use **conditional loops** to allow their agent to automatically farm an area.

The learner will use their knowledge of the environmental factors (what plants needs to thrive and survive) to allow their agent to automatically farm a row plot that measures 1 block by 40 blocks.

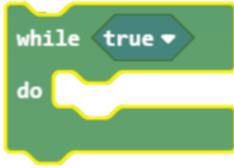
## LEARNING OBJECTIVES

The learner will:

- Learn to use **conditional loops** to allow their agent to perform repeated tasks based on conditions in Minecraft: Education Edition.
- Learn the importance using “**while**” with **conditional loops**.
- Learn to use **conditional loops** to complete challenges.



## CODING BLOCKS

Definition	Code
<p><b>While Loop</b> Allows the agent to perform a repeated action as long as a condition is true.</p>	<p><b>Block</b></p>  <p><b>JavaScript</b> while (true) {  }</p> <p><b>Python</b> while True:     pass</p>
<p><b>On chat command</b> Allows code to begin upon the entry of a phrase in the chat box. (tells the agent when to start the conditional loop).</p>	<p><b>Block</b></p>  <p><b>JavaScript</b> player.onChat("run", function () {  })</p> <p><b>Python</b> def on_chat():     pass player.on_chat("run", on_chat)</p>
<p><b>Agent detect</b> Allows the agent to “sense” or detect the item in relation to its own position.</p>	<p><b>Block</b></p>  <p><b>JavaScript</b> (agent.detect(AgentDetection.Block, FORWARD))</p> <p><b>Python</b> agent.detect(AgentDetection.BLOCK, FORWARD)</p>

## KEYWORDS (OR PHRASES)

1. **While** allows a repeated action to be performed as long as a condition is met.
2. **Detect** the ability to sense an item in relation to its position.

## GUIDING QUESTIONS

1. What do you do when you want to enter a room and the door is closed?



*Sample Answer: You have to turn the door knob, pull the door, then open the door by pulling or pushing.*

2. How do you know what areas to wipe when cleaning up a spill?

*You see the spilled object on the floor and table.*

## **TUTORIAL 1: DESTROY PASSAGE** (Novice-5 minutes)

### **Main objective:**

The learner will utilize **conditional loops** to code the agent to clear a passage.

**Answer Key:** [https://makecode.com/\\_07RT9maLwVzj](https://makecode.com/_07RT9maLwVzj)

## **TUTORIAL 2: AGENT BUILD BRIDGE** (Intermediate-10 minutes)

### **Main objective:**

The learner will use **conditional loops** to code the agent to build a bridge.

**Answer Key:** [https://makecode.com/\\_g9xbfD3mxWXb](https://makecode.com/_g9xbfD3mxWXb)

## **TUTORIAL 3: SPIRAL ACTIVITY** (Expert-15 minutes)

### **Main objective:**

The learner will utilize **conditional loops** to code the agent to navigate through a spiral.

**Answer Key:** [https://makecode.com/\\_OdPdQ0bVVH8d](https://makecode.com/_OdPdQ0bVVH8d)



## EDUCATIONAL APPLICATION (20 minutes)

**Subject Area:** Life Science

**Main purpose of the activity:**

The learner will:

- Use **conditional loops** to allow their agent to automatically farm an area.
- Use their knowledge of the **environmental factors** (what plants needs to thrive and survive) to allow their agent to automatically farm a row plot that measures 1 block by 40 blocks.

**Outcome of This Activity:**

The learner will have successfully coded the agent using **conditional loops** to farm the row of crops using the hoe, seeds and bone meal.

**Possible Solution for this Activity:**

[https://makecode.com/\\_AC11WzV8o0gy](https://makecode.com/_AC11WzV8o0gy)

## LESSON CONCLUSION/REFLECTION (5 minutes)

Ask the learner about the skills that they have practiced during the activity to reinforce new concepts.

1. What is a **condition**?

*It's the state of an object. It can be true or false.*

2. What is a **conditional loop**?

*A **conditional loop** is a way for tasks to be repeated as long as a certain aspect or condition is true.*

3. Why are **conditional loops** important in coding?

**Conditional loops** allow tasks to be completed based on the surrounding environment.

## OPPORTUNITIES TO EXTEND THE LEARNING:

Minecraft: Education Edition offers many opportunities for teachers and learners to extend and enrich the learning experience beyond this lesson.

- Consider having learners use the book and quill and camera to document their learning as they progress through the coding tutorials and the learning scenario.
- Learners could create their own learning scenario focused on conditional loops and create a challenge for a classmate to solve.
- Consider using “unplugged” coding activities from code.org, like “Until Simon Says” (<https://curriculum.code.org/csf-1718/coursed/12/>) to add a tactile experience for the learner.

## EDUCATION STANDARDS

**NEXT GENERATION SCIENCE STANDARDS (NGSS)** (<https://www.nextgenscience.org/>)

**MS-LS1-5:** Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

**COMPUTER SCIENCE TEACHERS ASSOCIATION (CSTA) COMPUTER SCIENCE STANDARDS K-12**

<https://www.csteachers.org/Page/standards>



**1A-AP-11:** Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.

**1A-AP-12:** Develop plans that describe a sequence of events, goals, and expected outcomes.

**1A-AP-14:** Debug, (identify and fix) errors in an algorithm or program that includes sequences and simple loops.

**1B-AP-10:** Create programs that include sequences, events, loops, and conditionals.

**1B-AP-11:** Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.

#### **INTERNATIONAL SOCIETY FOR TECHNOLOGY IN EDUCATION (ISTE) STANDARDS FOR STUDENTS**

<https://www.iste.org/standards/for-students>

**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.

