



MINECRAFT

EDUCATION EDITION

Educator Guide

Single Student

Coding Concept: CONDITIONALS

Conditionals in coding are loops that have to meet certain requirements in order to run. They are important because they allow the program to only run when various conditions are met which create a more complex code.

For more information on **conditionals**, refer to:

<https://code.org/hourofcode/unplugged-conditionals-with-cards>

EDUCATION.MINECRAFT.NET

Conditionals in Minecraft: In Minecraft, conditionals are used to program the agent or player to do a specific action **ONLY** when a certain condition is met. Using the If/Then or the If/Then/Else block or code will set the agent or player to check to see if a certain condition is met. If it is met, a specific action in the Minecraft world will run.

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 Maze

Intermediate: Chopping Trees

Expert: Agent Pyramid

Educational scenario:

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 create a **cause and effect** experience within Minecraft: Education Edition.

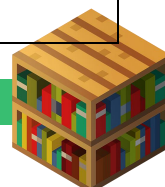
LEARNING OBJECTIVES


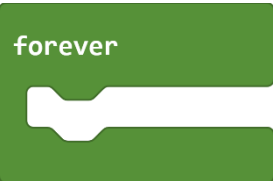
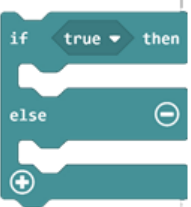
The learner will:

- Learn how to use a **variety of loops** to repeat sections of code.
- Learn the purpose of **conditional loops**.
- Learn how **conditional loops** work inside code.



CODING BLOCKS

Definition	Code
If then Runs code when a condition is met.	Block



Definition	Code
	 <p>JavaScript if (true) { } Python if True: pass</p>
<p>Forever Runs the code repeatedly when the Makecode coding window closes.</p>	<p>Block</p>  <p>JavaScript loops.forever(function () { }) Python def forever(): pass loops.forever(forever)</p>
<p>If then else Runs a specific code depending on whether a condition is met or not met.</p>	<p>Block</p>  <p>JavaScript if (true) { } else { } Python if True: pass else: pass</p>
<p>Repeat Runs part of the code a defined number of times.</p>	<p>Block</p>



Definition	Code
	 <p>JavaScript for (let index = 0; index < 10; index++) { } Python for index in range(10): pass</p>
<p>While Repeats the code if a defined condition is met.</p>	<p>Block</p>  <p>JavaScript while (true) { } Python while True: pass</p>

KEYWORDS (OR PHRASES)

1. **Conditionals** are loops that have to meet certain requirements in order to run
2. **Boolean** is an expression that is either true or false.

GUIDING QUESTIONS

1. Are there chores you do at your home that you must do in order to earn your allowance?
Example Answers: Make my bed, unload the dishwasher, walk the dog
2. If your parents told you that if you make all A's, they will give you \$50 but you make all A's and 1 B. Will you get the money? Why or why not?
No, the \$50 was on the condition that I got all A's.
3. In a video game, what are some of the requirements that must be met in order to complete the game?
Accomplish the task within the time limit, follow the rules of the game.

TUTORIAL 1: AGENT MAZE (Novice-5 minutes)

Main objective:



The learner will code the agent to find its way through any maze by using **chat commands** and an **if / else loop**.

Answer Key: https://makecode.com/_5rLHph15H4YX

TUTORIAL 2: CHOPPING TREES (Intermediate-10 minutes)

Main objective:

The learner will use **chat commands** and **loops** to code the agent to automatically chop down trees.

Answer key: https://makecode.com/_bHYdKfKCy7Ri

TUTORIAL 3: AGENT PYRAMID (Expert-5 minutes)

Main objective:

The learner will use **chat commands** and **loops** to code the agent to build a pyramid.

Answer key: https://makecode.com/_ig5Ho3V8LRJg

EDUCATIONAL APPLICATION CASE (15 minutes)

Subject Area: Language Arts

Main purpose of the activity:

The learner will:

- Practice cause and effect with **if statements**.
- Code an **if statement** that says if a certain crop is planted, a specific animal that likes to eat that crop is **spawned**.

The learner's challenge is to use if statements to spawn animals that eat that particular crop. In this world, there are various enclosures that call for a type of plant to be planted and a specific animal to be spawned. The learner will have to read the signs at each enclosure and then write the code using an **if statement**. (It should be - if the crop is planted, then the specific animal is spawned.)

Outcome of This Activity:

The learner will have successfully used **if statements** to spawn specific plants for a specific animal.

Possible Solution for this Activity: https://makecode.com/_KJoEkh89baVy

LESSON CONCLUSION/REFLECTION (5 minutes)

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

1. What does a **Forever loop** do?

It makes the code inside the loop repeat forever.

2. What is a **Conditional**?

It's a statement that tells a program to do different actions depending on whether a condition is true or false.



3. If the **condition** of the **if** portion of the code in an **if / else loop** is met, will the **else** portion run?
No. Else will only run if the if portion of the code is not met.
4. Describe a **while loop**.
A while loop will run the code only while a certain condition is being met.

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.

- Learners could extend the conditionals by utilizing the else portion to include another action. For example, if the corn is planted, a horse is spawn, ELSE, a zombie horse is spawned.
- Students could work through the puzzles using conditionals at this link: <https://studio.code.org/s/course3/stage/7/puzzle/1>.

EDUCATION STANDARDS

COMMON CORE STATE STANDARDS-ENGLISH LANGUAGE ARTS

<http://www.corestandards.org/ELA-Literacy/RI/3/3/>

CCSS.ELA-LITERACY.RI.3.3: Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

CCSS.ELA-LITERACY.RI.3.8: Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence)

COMPUTER SCIENCE TEACHERS ASSOCIATION (CSTA) COMPUTER SCIENCE STANDARDS K-12 <https://www.csteachers.org/Page/standards>

1A-AP-08: Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.

1A-AP-09: Model the way programs store and manipulate data by using numbers or other symbols to represent information.

1A-AP-10: Develop programs with sequences and simple loops, to express ideas or address a problem.

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

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.

INTERNATIONAL SOCIETY FOR TECHNOLOGY IN EDUCATION (ISTE) STANDARDS FOR STUDENTS (<https://www.iste.org/standards/for-students>)



5D: Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

