MINECRAFT
EDUCATION EDITION

Educator Guide

Block 1 – Lesson 3
45 minutes
Single Student

Polar Bear Rescue: Sequencing and Conditional Loops

THEME OVERVIEW

Tell students that we are continuing in our work with the Animal Research Center (ARC). In this lesson, we are in the Arctic to investigate reports of a baby polar bear that has been separated from its family. Rising glacial temperatures are causing more and more of the arctic to melt away, causing the life of the polar bear to be much more difficult due to lack of ice to live on and dwindling food supplies.

CODING OBJECTIVES

By the end of Lesson 3 the students will have learned more about **Sequencing** and **Advanced Loops.**

THINGS TO KEEP IN MIND

- Students are given a radio in the first slot of their hotbar. This item allows students to reset the coding activity.
- Remind students there may be more than one solution for each of the activities.
- When using a while loop, to stop code from running students need to press C again, this will deactivate the coding.
- Use the Handout to capture students' learning: ask students to take a screenshot of the coding snippet and write the explanation of what the code does (this can be used as homework).

NEW CODING BLOCKS

	While Repeats the code if a defined condition is met.
	Agent detect Detects if there is a block next to the Agent in a defined direction.

KEYWORDS

Loop - a structure that repeats a set of instructions (algorithms) until it is told to stop.

Conditional - a statement that tells a program to do different actions depending on whether a condition is true or false.

START OF LESSON PROCEDURE

Number of Activities: 4

LESSON REVIEW: 5 minutes

Recap of what was taught in the previous lesson: Students learned about algorithms, sequencing, pattern recognition, and loops.

1. Q. What is an algorithm?
   A. Detailed step-by-step instructions or formulas for solving a problem or completing a task.
2. Q. What did the <mark>Agent destroy</mark> block do?
   A. Tells the Agent to destroy blocks in certain directions.
3. Q. What is sequencing?
   A. The order the steps should be done in to complete a task.
4. Q. What did Loops help you do in the previous lesson?
   A. Helped eliminate the need to use the same line of code over and over.

LESSON INTRODUCTION AND LEAD-IN: 5 minutes

Coding Practice – Advanced Loops and Conditionals:

In our previous lesson we learned how Loops improved the coding efficiency in giving the Agent commands. Students learned to construct algorithms and put them in sequence and based on that sequence they were able to repeat steps using repeat Loops.

Lead-in:

Remind students they are in the Arctic. In order to help the polar cub to find its family they are going to use expanding knowledge of **Loops** and **Conditionals**

Review **Loops.** Have students think of a repetitive task they do every day. Have them write out that task using **Pseudo Code**, then (based on their knowledge of **Loops** from the previous lesson) write the **Loop** down.

In this lesson students will use a while loop. In this case, while the Agent is doing something, another command will occur. Think of it as **while** you are walking along the beach, you are **detecting** if you see seashells.

CODING ACTIVITIES: 30 minutes

Activity 1: Locate the cub

Tell students that they are on a mission to find a lost polar bear cub. When they arrive in the world, they see paw prints. These paw prints are in the same direction as an avalanche. Explain to students that they need to program the Agent to dig a path without knowing how far the avalanche goes.

Tell students that they are going to use a different type of Loop block to help dig through the avalanche (while repeat block). This block tells the Agent to do one action, while the Agent detects another block.

Students need to program the Agent to move through the avalanche:

Activity 2: The great chasm

Tell students that they need to program the Agent to build a bridge over the chasm.

Activity 3a: Higher ground

Now that students have found the cub, they need to program the Agent to build a tower to climb so that they might have a better chance to look for the cub's family. First, they are going to build the tower.


Activity 3b: Higher Ground

After the Agent has built the tower, students need to program the Agent to put the ladder so that they can climb the tower. Explain students to ensure that they climb the ladder so they can find the cub's family.
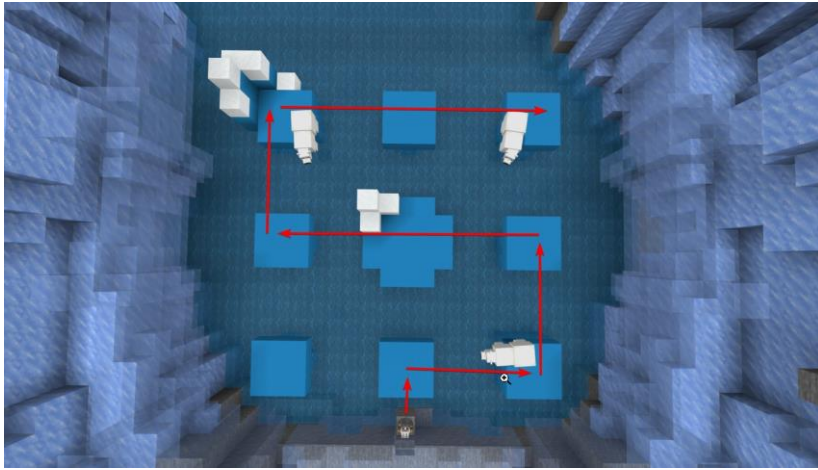

Bonus Activity: Separated Family

As students can see the cub's family just over the ridge past the clearing, they will need to head across but the ice is thin. Students will need to send the Agent first to fill in the cracks, so the bears can cross safely.
Here is an image of the potential solution:
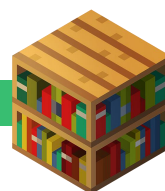
LESSON CONCLUSION: 5 minutes

Ask the students about the skills that they have learned during the lesson, to reinforce the concepts.

1. Q. What does <mark>Agent detect</mark> do?

   A. Agent can determine if an item is around.

2. Q. What is a **Conditional**?

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

3. Q. What is it called when we repeat code over and over?

   A. A loop.

4. Q. True or False? Can the Agent hold its own inventory?

   A. True

REFERENCES:

- https://www.nationalgeographic.com/news/2018/02/polar-bears-starve-melting-sea-ice-global-warming-study-beaufort-sea-environment/
- https://arcticwwf.org/species/polar-bear/threats/
- https://www.natgeokids.com/nz/discover/animals/general-animals/polar-bear-facts/

EDUCATION STANDARDS - LESSON 3

CSTA K-12	
1A-AP-09	Model the way programs store and manipulate data by using numbers or other symbols to represent information.
1A-AP-12	Develop plans that describe a sequence of events, goals, and expected outcomes.
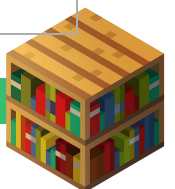
1A-AP-14	Debug, (identify and fix) errors in an algorithm or program that includes sequences and simple loops.
1B-AP-08	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
1B-AP-10	Create programs that include sequences, events, loops, and conditionals.
1B-AP-11	Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
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.