

Lesson 4 - Loops and Conditionals

Objectives

I can demonstrate understanding of sequencing and advanced loops.

Standards

- 4-6.CT.4 Decompose a problem into smaller named tasks, some of which can themselves be decomposed into smaller steps.
- 4-6.CT.5 Identify and name a task within a problem that gets performed multiple times while solving that problem, but with slightly different concrete details each time.
- 4-6.CT.8 Develop algorithms or programs that use repetition and conditionals for creative expression or to solve a problem.

Vocabulary

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.

NEW CODING BLOCKS



While

Repeats the code if a defined condition is met.



Agent detect

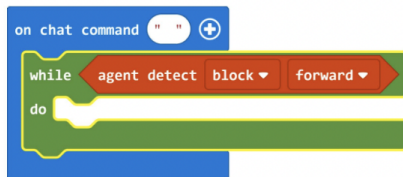
Detects if there is a block next to the Agent in a defined direction.

Gradual Release of Responsibility (I do/We do/You do)

I Do/We Do

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.



You Do: Coding Activities

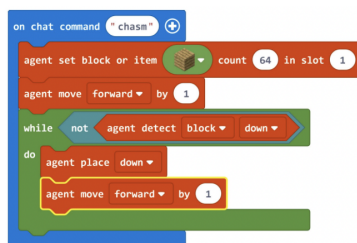
Activity 1: Locate the cub

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:



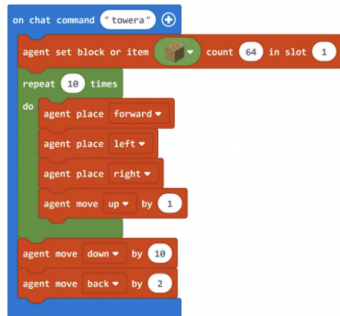
Activity 2: The great chasm

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



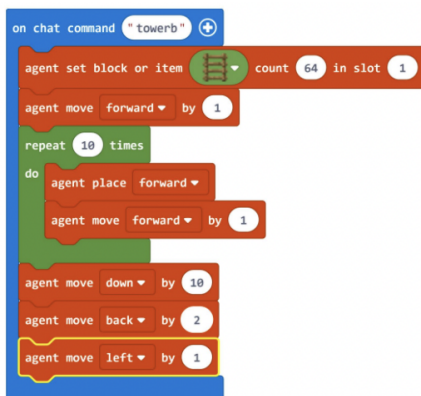
Activity 3a: Higher ground

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.



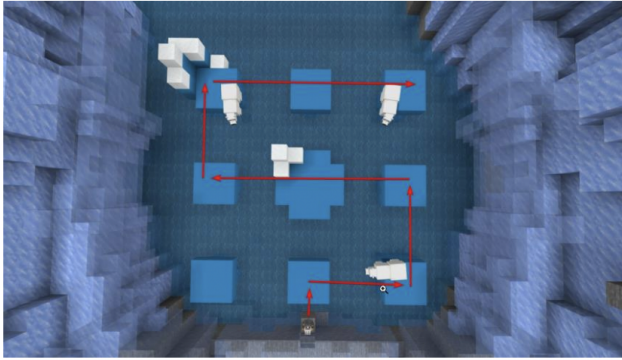
Activity 3b: Higher Ground

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:



Exit Ticket

1. Q. What does Agent detect 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