MINECRAFT EDUCATION EDITION

Educator Guide

Block 1 – Lesson 5
45 minutes
Single Student

Gray Wolves: Loops and Conditionals

THEME OVERVIEW

Tell students that a part of the responsibilities as members of ARC is to try to correct misinformation about animals. That misinformation and lack of understanding has really hurt the gray wolf population. People have hunted gray wolves for years out of fear. And as progress infringes on more of their habitat, we need to help humans understand wolves better to lessen the confrontations.

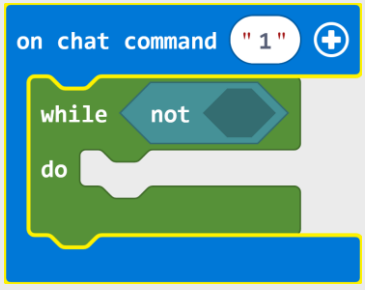
CODING OBJECTIVES

In Lesson 5 we will continuing to work with loops and nested loops. Specifically, negative conditions will be introduced.

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 conditon is met

KEYWORDS

Loop - a structure that repeats a set of instructions (algorithms) until it is told to stop.
Nested Loop – A loop within a loop.
Conditional – An action that occurs if something specific happens.

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 the name of the block we use to make loops?
   A. Repeat.
2. Q. What is a nested loop?
   A. A loop inside a loop that causes the Agent to do two things at once.
3 Q. True or False. It's important to know the sequence of events before building a loop.
   A. True.
4. Q. What is the difference between repeat and conditional loops?
   A repeat loop reapeats an action a certain number of times. A conditional loop repeats an action, while a certain condition is met.

LESSON INTRODUCTION AND LEAD-IN: 5 minutes

Coding Practice – Loops and Nested Loops:

In the Panda lesson we worked with using loops more efficiently and increased that knowledge by creating nested loops, so we could do two things at the same time.

Lead-in:

We have received reports of a wolf pack hanging around a nearby farm. The farmers are concerned that the wolves will attack their livestock and are considering a hunting party to resolve the issue. Students need to get there; help secure the livestock in a safe way that will not only protect the livestock but the wolves as well. Tell students that they will do this by persuading the wolves to stay away.

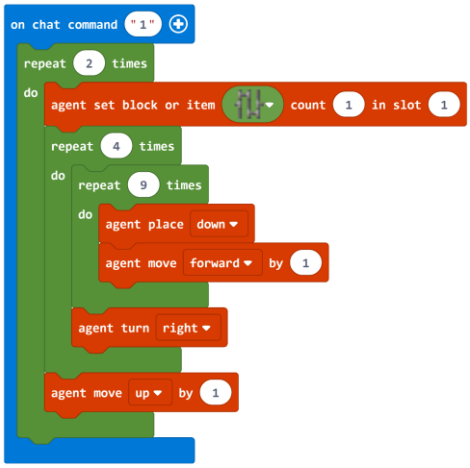
Tell students that in this lesson we will continue to work with loops and nested loops but we will be adding a conditional that will cause the Agent to be selective, make choices, what action the Agent will take. Tell students to imagine they are walking and picking flowers, however, this time they have decided they will only pick daisies. As they walk (one action), they are picking flowers (another action), if they see a dandelion (they don't pick it), they see a daisy (they pick the daisy).

CODING ACTIVITIES: 30 minutes

Activity 1: Secure the Chicken Coop

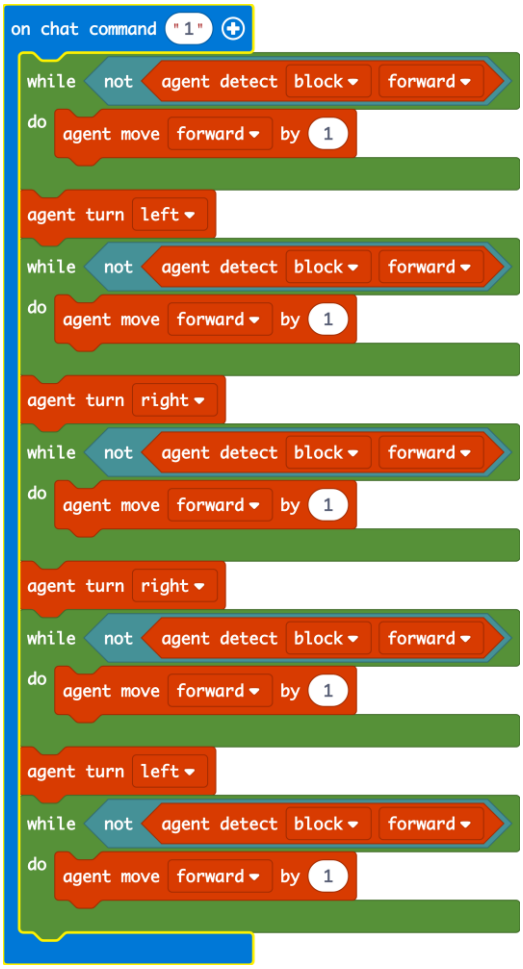
Tell students that chickens are a favorite food of wolves. They will need to program the Agent to reinforce the fence around the chicken coop to make sure the wolves can't get to the chickens. Explain to students that the wire fence needs to be 2 levels high to keep the wolves from being able to jump over it.

Here is some thought process: the Agent needs to lay fence along sides of the chicken coop, the Agent will need to turn corners, and the Agent will need to go up a row to install 2 levels of fence.
Hint: Due to the fact that the Agent needs to use more than 64 blocks of wire to build 2-levels high fence, it is necessary to provide the Agent with double the amount of wire.

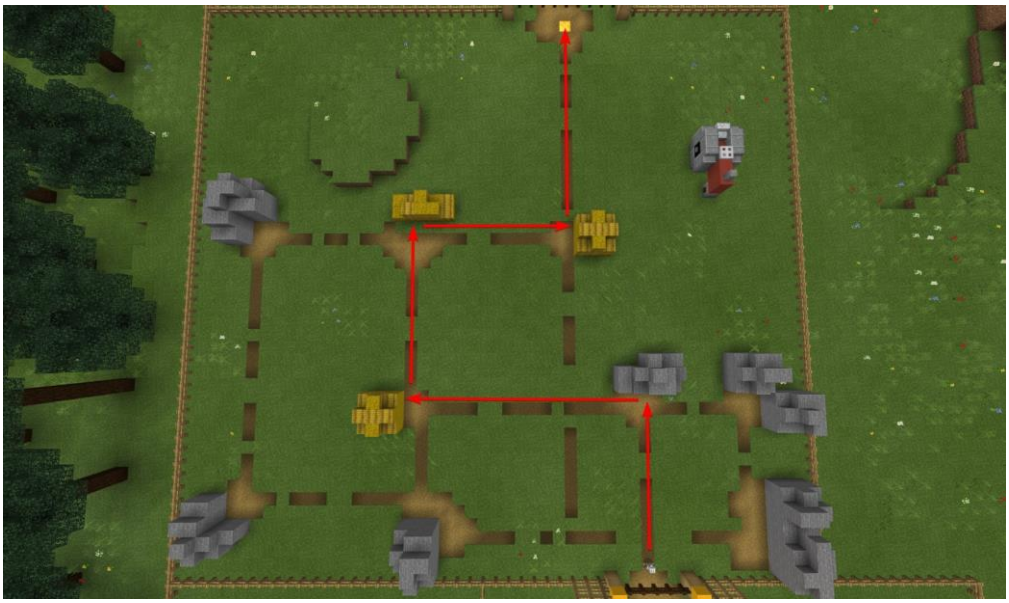


Activity 2: Moving the Sheep

Inform students that varying the pastures, the sheep graze in, can keep the wolves from predicting where the sheep will be. If students move the sheep around the pasture, it will keep them safer. Students need to program the Agent to lead the sheep to a different pasture. This activity will end with the Agent on the gold pressure plate.



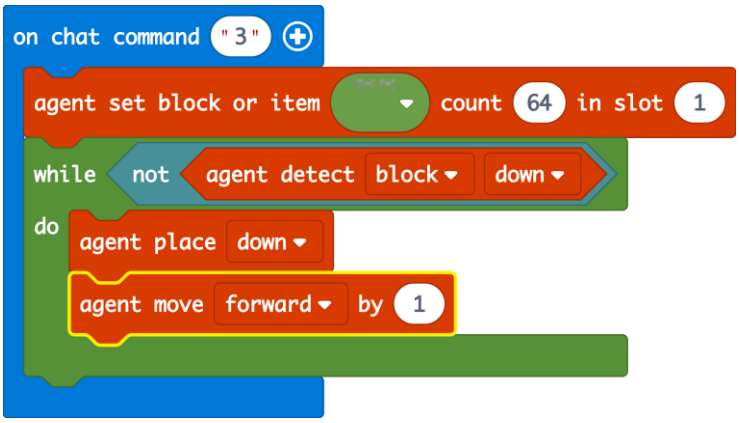
Take a look at the way students can move the Agent to the gold pressure plate. Demonstrate this screenshot to them to get a better understanding of what they need to code.



Activity 3: Hazing

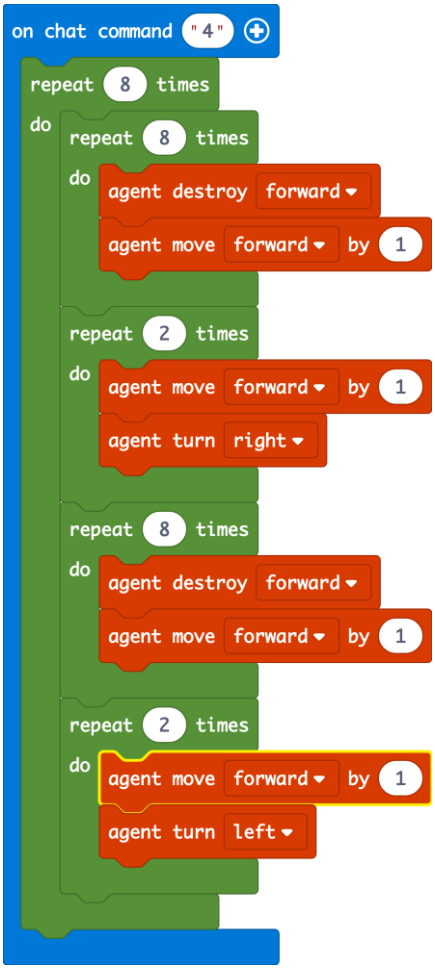
Tell students that hazing can be a great way to keep the wolves away. Hazing means making loud noises or motions that keep the wolves from the stealthy hunters. Setting up bells around the property that make loud noises

when the wolves enter the area should help keep them away. Students need to program the Agent to finish setting up the wires so they will ring, if a wolf trips the wire.



Activity 4: Clearing the area

Tell students that wolves are stealthy ambush hunters, that means if they don't have the ability to surprise their prey, they will look for somewhere else to hunt. Studetns need to program the Agent to remove foliage in the area.



There might be multiple soltuions that students come up with.

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 Agent Detect do?
   A. Agent can determine, if an item is around.
2. Q. What is a **Conditional**?
   A. 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://defenders.org/wildlife/gray-wolf
- http://www.wolfcountry.net/information/WolfEndangered.html
- https://wolf.org/wolf-info/wild-kids/fun-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.