Lesson 6 - Creating and Testing a Program

Objectives

I will explain how negative conditions work.

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.

Nested Loop - A loop within a loop.

Conditional - An action that occurs if something specific happens.

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

I Do/We Do

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).

You Do: Coding Activities

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.
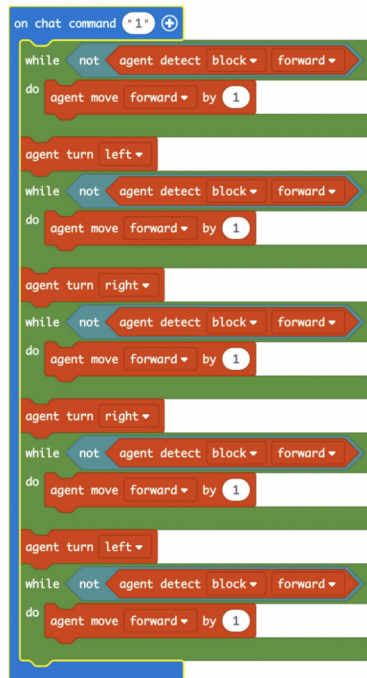
Here is some thought process: the Agent needs to lay fence along sides of the chicken coop, the Agent will need to turn corners, and the Agent will need to go up a row to install 2 levels of fence.

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.
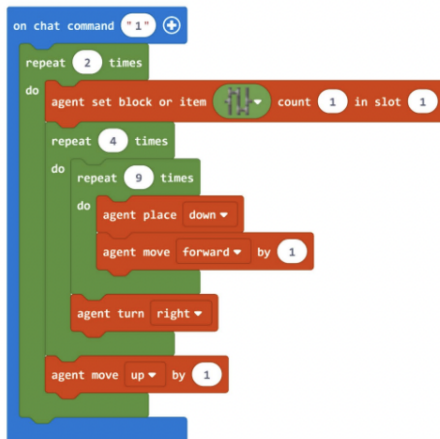

Activity 2: Moving the Sheep

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.

```
on chat command "1" ⊕
  while   not  agent detect block ▾  forward ▾
  do   agent move  forward ▾  by  1

  agent turn  left ▾
  while   not  agent detect block ▾  forward ▾
  do   agent move  forward ▾  by  1

  agent turn  right ▾
  while   not  agent detect block ▾  forward ▾
  do   agent move  forward ▾  by  1

  agent turn  right ▾
  while   not  agent detect block ▾  forward ▾
  do   agent move  forward ▾  by  1

  agent turn  left ▾
  while   not  agent detect block ▾  forward ▾
  do   agent move  forward ▾  by  1
```
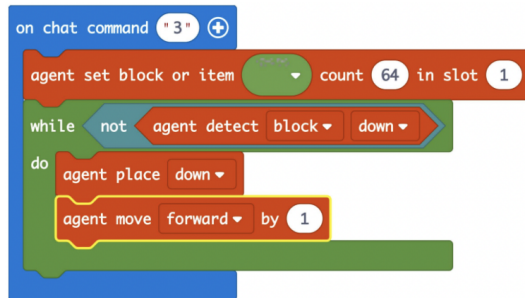
Take a look at the way students can move the Agent to the gold pressure plate. Demonstrate this screenshot to them to get a better understanding of what they need to code.
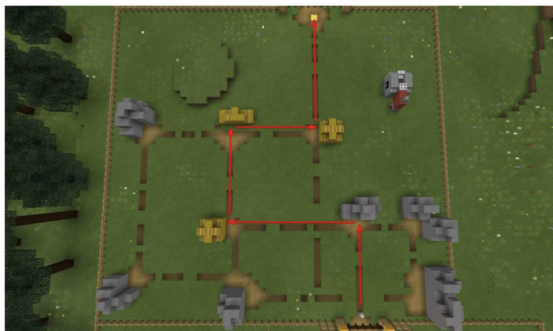
Activity 3: Hazing
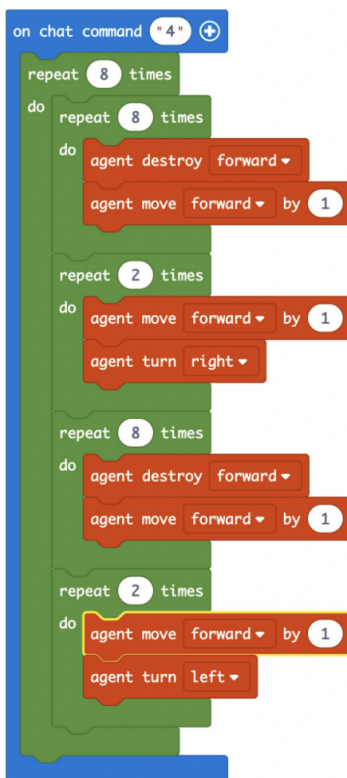
Tell students that hazing can be a great way to keep the wolves away. Hazing means making loud noises or motions that keep the wolves from the stealthy hunters. Setting up bells around the property that make loud noises when the wolves enter the area should help keep them away. Students need to program the Agent to finish setting up the wires so they will ring, if a wolf trips the wire.

```
on chat command "3" ⊕
  agent set block or item      ▼  count  64  in slot  1
  while   not ◁ agent detect  block ▼   down ▼ ▷
  do
        agent place  down ▼
        agent move  forward ▼  by  1
```

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.

```
on chat command "4" ⊕
  repeat  8  times
  do
      repeat  8  times
      do
            agent destroy  forward ▼
            agent move  forward ▼  by  1

      repeat  2  times
      do
            agent move  forward ▼  by  1
            agent turn  right ▼

      repeat  8  times
      do
            agent destroy  forward ▼
            agent move  forward ▼  by  1

      repeat  2  times
      do
            agent move  forward ▼  by  1
            agent turn  left ▼
```

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. 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