Kodu Session 6: Paths

Version of 4 June 2015

Learning Goals

- Kodu worlds can contain paths. They look like roads or walls.
- Every path has a color.
- The kodu can be told to follow a path.
- The kodu can tell when it has reached the end of the path.
- The "say" action lets the kodu deliver a message.

Time Required: 1 hour

Worlds

- Path1
- HexGraph1
- Ants1
- ForkedPath1

Tile Manipulatives

Flash Cards

- Follow the Yellow Brick Road
- Show Page As Color

Part 1: Following A Path

1. Load the Path1 world and explore it a bit.
2. The kodu wants to go back home to its hut. There is a yellow path leading through the woods that will take it home.
3. Read the "Follow the Yellow Brick Road" flash card. It explains how to make the kodu follow a path.
4. Enter this program for the kodu, using the Follow the Yellow Brick Road idiom:

   PAGE 1:
     [1] WHEN DO color me blue
     [2] WHEN DO move on path yellow
     [3] WHEN end of path me *(path colors)* yellow-path DO switch to page 2

   PAGE 2:
     [1] WHEN DO color me pink
     [2] WHEN DO say "I'm home!"
     [3] WHEN see hut DO move toward

5. Note: for "end of path" you must choose "path colors" and not "colors" to select yellow-path. If you select "yellow" instead of "yellow-path" the program will not work. Also, the "me" is required.
6. Run the program and watch how the kodu follows the path.
7. Try starting the kodu off at a different place. How does the kodu get itself onto the path?

Part 2: Moving From One Path To Another

Distribute the Hexgraph1 World handout and have students solve the problem on their own.

Part 3: Ants1 World

Distribute the Ants1 World handout and have students solve it either in pairs or on their own.

The solution is as follows:

PAGE 1
[1] WHEN DO color me blue
[2] WHEN see pushpad DO move toward
[3] WHEN bump pushpad DO switch to page 2

PAGE 2
[1] WHEN DO color me pink
[2] WHEN DO move on path white
[3] WHEN end of path me white-path DO switch to page 3

PAGE 3
[1] WHEN DO color me green
[2] WHEN DO move on path blue
[3] WHEN end of path me blue-path DO switch to page 1

Part 4: Complex Paths

1. Load the ForkedPath1 world. Notice that there are several colored paths in this world.
2. What does the kodu do if it reaches the end of a path and we haven't told it to switch pages? Let's find out. Program the kodu with the following rules:
   [1] WHEN DO move on path red
   [2] WHEN end of path me DO score 1 point

3. Run the program and see what happens. Will the kodu follow the path forever?

4. Now change the program to make the kodu follow the orange path. How many points does it score? What is the explanation for this: what is special about the orange path?

5. What does the kodu do when it reaches a fork in the path? The white path has several forks. Change the kodu's program to make it follow the white path, and remove the second rule (for detecting end of path and scoring a point.)
6. Each path endpoint has a colored rock on it that will keep count of how many times the kodu reached that point. The colors are yellow, blue, green, pink, and brown.
7. What do you think the kodu does at a fork in the path?
   a. It follows the branch that requires the shallowest turn.
   b. It chooses randomly.
   c. It alternates systematically, so if it went left last time it will go right this time, and vice versa.
   d. It chooses arbitrarily but always makes the same choice each time.
8. Run the program and see if your answer is correct.

Part 5: Review and Assessment

Have students complete the questionnaire for this lesson.