PHIRO

Unplugged

Lesson - 9

Walk the Line

Grade Band: K-2

Estimated Time: 45-60 min

Number of students: Combination, 1:1, Whole Group

ASK

Key Questions:

- What is the purpose of a sensor?
- How do sensors protect Phiro? People?
- Can you identify all of Phiro's sensors?

IMAGINE

- Begin by drawing a thick black line on white paper and demonstrating Swish Card #68.
- Ask students, How does Phiro know how to follow the line?
- Choose 6 students they will be Phiro's sensors.
- Have students act out the following scenario.
  - Phiro has 6 sensors:
  - If both bottom sensors senses white, Phiro moves forward.
  - If Phiro right sensor senses white, Phiro turns right.
  - If Phiro left sensor senses white, Phiro turns left.
  - Otherwise, stops
  - Repeat steps "a" to "d" many times to complete following the line

PLAN

- Show students the Orange "IF sensor" Conditionals and Loops Swish Cards.
- Identify which Conditionals and Loop cards you need for your code. Remind students Loop means never ending unless broken.
- Explore the Blue movement Swish Cards.
- Identify which cards you will need for your code.
- Plan as a class the sequence of cards based on the problem-breakdown steps.

- If both Phiro's bottom sensors senses white, Phiro move forward.

- If Phiro right sensor senses white, Phiro turn right.

- If Phiro left sensor senses white, Phiro turn left.

- Otherwise, stop.

- Repeat steps a to d many times to complete following the line

MAKE

- Once you are ready, record your program in your Science Journal.
- Now enter your program and press download.
- In case of the sample maze, one of the possible ways you can code Phiro to move is:
  - Forward (X3)
  - Left Turn
  - Forward (X3)

- Did Phiro and Frog make it across?
- If they fell into the water, "dry" Phiro, debug and try again.
- Make sure to record how you corrected.

REMIX/ ASSESSMENT

Ask the students:

- Once you are successful, try changing the route or teaching Phiro a shorter way to get to Frogs.
- What did you learn from this activity?
- Did you find any bugs?
- If so how did you fix them?

Assess them on the following:

- Have student's share how they would improve this activity for future students.
- Participation
- View written and modified programs from science notebooks.

EXTENSION IDEAS

- Challenge-Which team can cross using the fewest Swish Cards
- Can two Phiros cross at the same time?
- How can Phiro cross and come back without falling into the water?

Tags:

#STEM #STEAM #Robots #Coding #EarlyEd #EdTech #unplugged

PERFORMANCE EXPECTATIONS

- **NGSS K-2-ETS1-1** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

- **NGSS K-2-ETS1-2** Develop a simple sketch, drawing or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

- **NGSS K-2-ETS1-3** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

- **ISTE 1.c** Use models and simulations to explore complex systems and issues.

- **ISTE 4.b** Plan and manage activities to develop a solution or complete a project.

- **ISTE 6.a** Understand and use technology systems.

Algorithm

SWISH Card Sequence