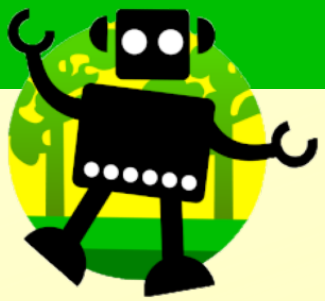


Module 3 - Activity 10:
More "Pen Bots"...

Overview
Students will run a program to explore the problem, then work to debug the coding so the pen bot follows the correct route.

Computing PoS Reference
- Write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.
- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

Learning Objective
- I can decompose the route and debug the algorithm.

Success Criteria
All: I can debug the code. I can test as I debug.
Most: I can decompose the route. I can debug the code. I can test as I debug.
Some: I can decompose the route. I can debug the code using clues from the algorithm. I can test as I debug.

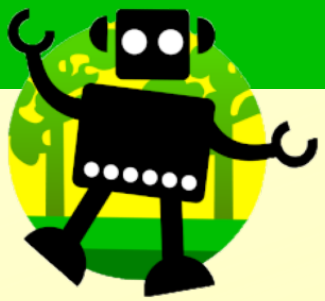
Key Words
debugging, decompose, angle, direction, motion, block, algorithm, sequence, code.

Computer Science Concepts
- Algorithm design.
- Debugging.

Cross Curricular Concepts
- Mathematics: turning, angles, degrees.

Introduction
Share the learning objective and the success criteria. Explain that the students will be debugging (fixing) the code.

Activity 10: More "Pen Bots"



EXPLORE: Play the adventure section and run the first bugged program.
Q: What is wrong with the code? How can we debug it?
Q: Which part of the algorithm do we need to change?
OFFLINE ACTIVITY: Set up a similar scenario in the classroom and ask the students to walk through their instructions to test the distance and the turns.

DISCUSS: Ask students to share their ideas. Use one to demonstrate how to change the values on a block and then test the code.
Q: Did the code work? What do we need to do if the code doesn't complete the challenge?
Q: Are there any clues in the algorithm we can use to work out the correct distance and angle?
CHALLENGE: Students should work in pairs to debug each line, recording their different attempts on paper.
EVALUATE: Ask students to explain how they completed the challenge.
Q: Did you find anything particularly tricky, and why?
Q: How did you decide which part of the algorithm to change?
Q: Were there any clues in the algorithm that helped you?

SEN Support

Use the Support Sheet to check the code against the blocks and annotate their ideas, allowing them to keep trying until they find the incorrect block.

Resources

- Support Sheet.

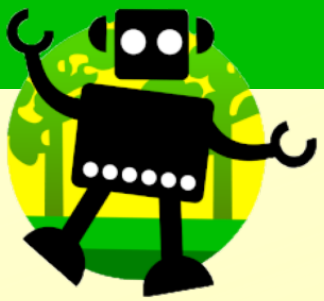
Extension Activity

Design their own debug challenge. Create a tunnel on squared paper and write the algorithm to escape, leaving one value blank. Ask a classmate to complete the code.

Possible Key Questions For Assessment

Can you give two top tips for debugging?
What skills do you use when debugging?
Why is it important to be able to decompose an algorithm?
Which clues in the code helped you work out the correct value?

Activity 10: Support Sheet



Q: Which block in the code is incorrect?
Write the code you're given on screen below. Follow the code block by block and tick the coding until you find the block of code that is incorrect.
Q: Is it the distance or the angle?
Make notes on the Sheet. Now go back to the screen, input your idea and run the program to see if you are correct. If not, have another go!