1. Introduction

Programmers often have bugs or errors in their code. To fix these bugs, programmers debug. Debugging is the process of finding and correcting errors or bugs in programs. Sometimes a bug or error is easy to identify. Other times, you need to make changes to your code and retest multiple times before the bug is resolved. A bug can happen because only one block is placed in the wrong order of the sequence, one block is missing completely, or one block has an incorrect setting chosen. A bug or error can also happen because multiple blocks are in the wrong order, missing, or have incorrect settings chosen.

2. How to Identify a Bug by Watching Your Bot

Build the bugged program, but do not show it to students. Run the program, telling students the debugged sequence.

Bugged program:	Debugged program:
skate forward	skate forward
spin left	display disco lights
display disco lights	spin left
move forward	move backward
repeat the sequence a second time	repeat the sequence a second time

3. How to Identify a Bug by Looking at Your Code

The bot did not do what you intended. Repeat to students the sequence of actions from the debugged program. The first bug is that the bot spun when it was supposed to display lights like a disco ball. The second bug is that it moved forward when it was supposed to move backward. Now, have students look at the code blocks you used to make the program. Ask students to try to find the bugs in your code.

4. How to Fix a Bug

Have students share the bugs they found. Demonstrate correcting the bugs and running the program again.

5. Build the Bugged Program

Ask students to build the following program:

Add two set top light color blocks, change one to green, leave the other red

Add a move forward block below the set top light red block, change distance to 3 steps

Add a wait 1 second block below the move block

Add a count-controlled loop around all the blocks, change the count to 3 times

6. Run the Program and Watch Your Bot's Behavior
Tell students the intended outcome.
display green light
move forward very fast
display a red light
stop and wait
repeat the sequence
Ask students to debug their program.

7. Look at Your Code and Identify the Bugs
There are two bugs in the program, one block in the wrong place and one incorrect setting.

Bugged program:	Debugged program:
display a green light	display green light
display a red light	move forward very fast
move forward at medium speed	display a red light
stop and wait	stop and wait
repeat	repeat the sequence

8. Debug and Run the Program
Have students debug and run the program again. Continue observing and debugging as necessary.

9. Lesson Wrap-Up
Have students explain to a partner, in writing, or in a group discussion:

1. the coding blocks used in their program and why
2. a problem they encountered and how they attempted to solve it
3. how their bot behaved based on the coding blocks used and if the bot ran the program correctly
4. what debugging is and why it is important to do