



Walk This Way

The Big Idea:

It's one thing to take a walk. It's another to follow someone else's instructions telling you where to walk! Today we'll take turns writing "code" for "robots" (kids and adults) to follow. Let's see what funny robot moves the coders have in store!

You Will Need:

- ★ To print: Radical Robot Commands (page 4)
- ★ Scrap paper
- ★ Pencil or pen

The Math Behind the Scenes:

We've all seen robots, but what exactly is a robot? It's a programmable machine, meaning people write a set of instructions, or a program, that tells it what to do. Robots only understand actions that are listed step by step in specific "code," which is a special set of words and symbols that a computer can understand. You may have heard the term "coding." That's another way of saying that you're writing a program.

Simon Says – for Robots

First, let's see what it feels like to follow a program. Follow these instructions as exactly as you can.

1. Step right foot forward.
2. Step left foot forward.
3. Lift right hand up.
4. Put right hand on head.
5. Lift right hand up and down on head 3 times.
6. Yell "Panda parade!"

You probably didn't know why you were doing this silly routine, but a program is a program – you just follow it, step by step. We normally call picking up your hand and putting it back down on your head as patting yourself on the head, but robots only understand actions that are listed step by step in specific "code." This ensures that every robot follows the program the same exact way.

Radical Robots

Now you're going to program each other! As a robot you only understand certain words, so you'll have to start your action using the moves listed on the Radical Robot Commands list. You may combine a move with a direction and number of times to perform a single action. For example, "LIFT RIGHT ARM" or "3 HOPS FORWARD." But remember – you have to write the program one action (or one command) at a time. And when the command reads: step, skip or hop, it means one normal step, skip, or hop, not a gigantic one!

1. Hand one kid a piece of scrap paper, a pencil or pen, and a copy of the Radical Robot Commands list.
2. Decide where the starting spot will be.

3. Have the kid write the robot's final position (e.g. sitting in the middle of the couch, standing in front of the kitchen sink) on the bottom of their paper. They should work quietly to keep the final position a secret!
4. Have the kid spend 5-7 minutes writing a routine to get the robot to its final position using the specific language on the Radical Robot Commands list.
5. Give a 2-minute warning if they are very engrossed!
6. When time's up, have another kid or adult act as the robot, make sure to keep the final position a secret from the robot!
7. Have the first kid read its instructions to the robot. The robot follows the steps as given. See what unexpected things happen!

Debugging Out

Now that you've seen a robot do your program, do you think you know what steps to write differently? Sometimes machines stop working because of an error in the program called a "bug." Finding and fixing bugs is called debugging in computer science. We're now going to debug our programs and have a new robot try it!

1. Talk through anything that went unexpectedly, and what steps should change to enable any robot to reach its goal.
2. Have the first kid write up the program again from start to finish.
3. Have another kid or adult be the robot. If you don't have another person to be the new robot, then write a new program for a different final destination and have the same person be the robot.
4. The kid reads the debugged program to the new robot. See if the program works better this time!
5. Feel free to continue debugging, robot-rotating and program-running as interest allows!

Radical Robot Commands

You can pair a move with a direction when writing each command. You can also include the number of times you'd like your robot to perform that move.

Move	Direction
Clap	Backward
Grab	Forward
Hop	Right
Lift	Left
Pick up	Up
Put down	Down
Sit	Around
Spin	Half-way
Stand	One-quarter
Step	
Stomp	
Wiggle	
Yell	