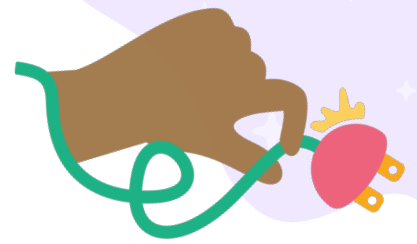# UNPLUGGED

Code a Lego Maze

Design a simple maze using physical Lego bricks. Can you direct a character through the maze successfully using these four instructions: move forward, move backward, turn left, and turn right? Explore how to write an algorithm, or sequence of instructions, in this paired activity.

Step 1: Create a simple maze using Lego bricks. Use any bricks you would like, as long as the brick studs (the round bumps that snap Legos together) are showing.

Step 2: Position a character at the start of your maze. It could be a Lego figure, plastic animal, etc. To program the object to move through the maze, you will use only these four instructions:

- Move Forward
- Move Backward
- Turn Left
- Turn Right
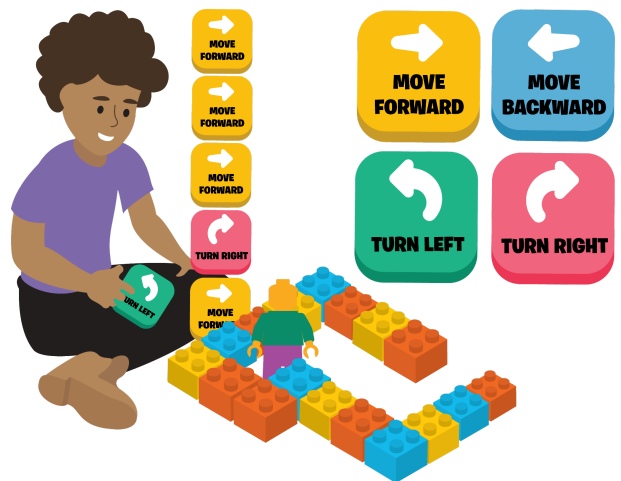
Step 3: Determine a unit of measure such as: [two brick studs = one move forward or backward]
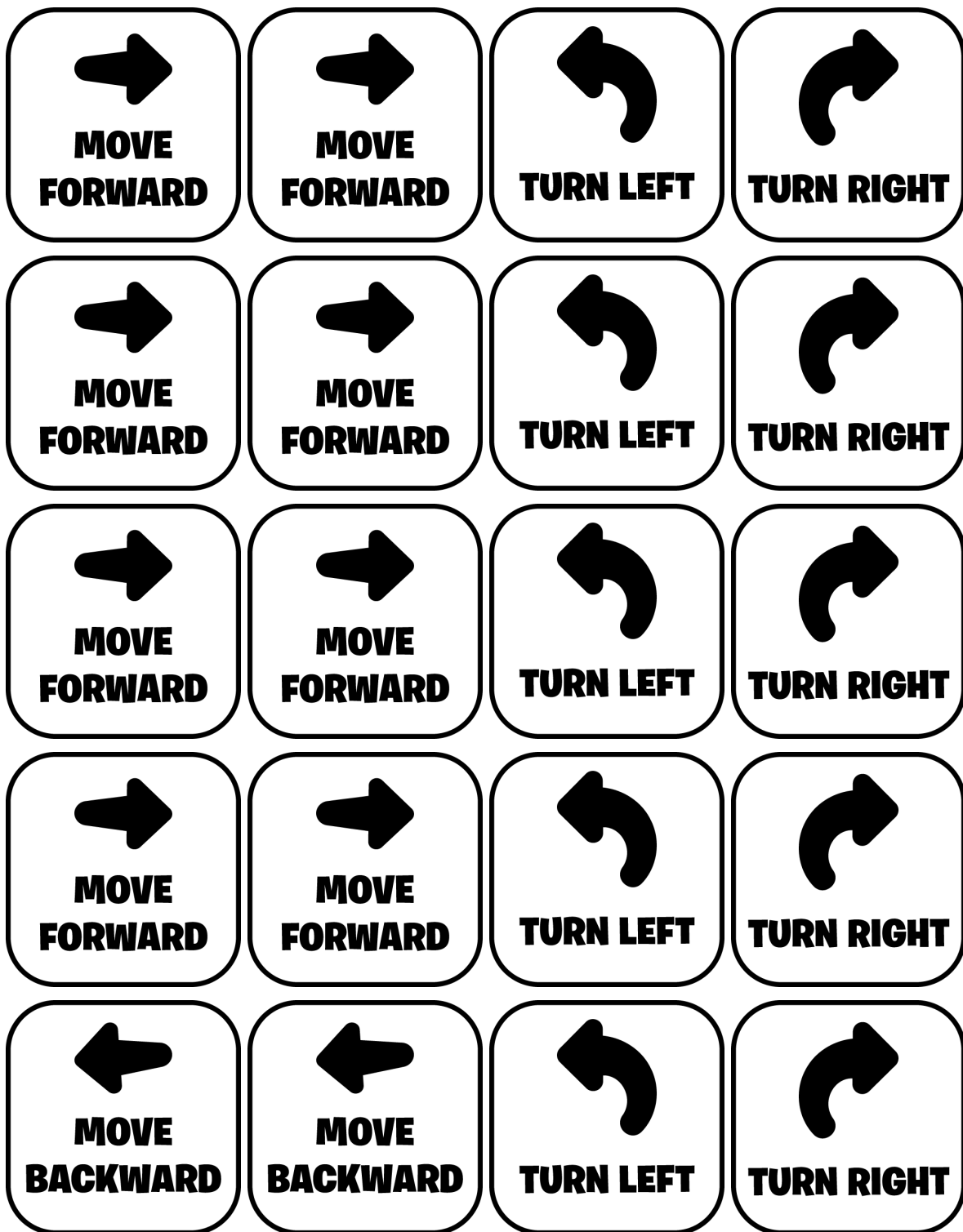
Using this unit of measure, what is your first instruction for the character to move through the maze? Write your full set of instructions on separate index cards or a sheet of paper. You can also print and cut out the cards on the following page so you can lay out each step in your instructions (your algorithm) on a table or floor.

Step 4: Once you have completed your instructions, pass them to a partner and see if they can follow your algorithm to successfully guide the character through your maze. Were there any problems? Find the errors in your code (debug), by checking the order of the steps (the sequence) and make corrections where necessary.

Try it in Scratch! Try using Motion blocks like "move," "turn," or "point in direction" in a Scratch project. You could even create a virtual maze (like this one) by coding impassable walls using color sensing, and navigate your sprite with arrow keys.

Printable Instruction Cards:

→ MOVE FORWARD	→ MOVE FORWARD	↰ TURN LEFT	↱ TURN RIGHT
→ MOVE FORWARD	→ MOVE FORWARD	↰ TURN LEFT	↱ TURN RIGHT
→ MOVE FORWARD	→ MOVE FORWARD	↰ TURN LEFT	↱ TURN RIGHT
→ MOVE FORWARD	→ MOVE FORWARD	↰ TURN LEFT	↱ TURN RIGHT
← MOVE BACKWARD	← MOVE BACKWARD	↰ TURN LEFT	↱ TURN RIGHT

Tip: If you'd like to translate this document, **click here to make a copy** of this Google doc.