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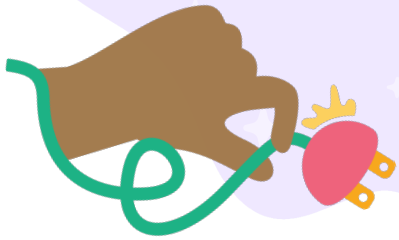
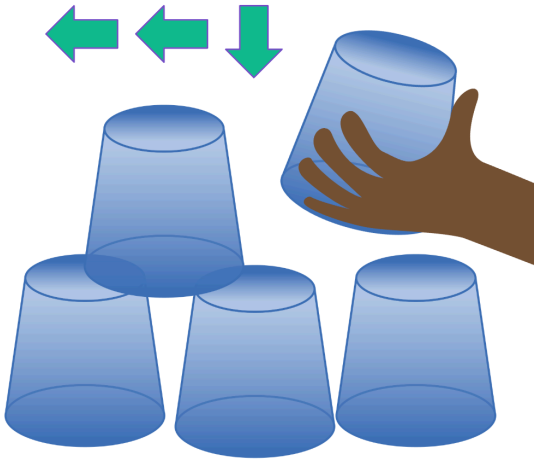


Cup Stack Coding

Pair programming is when one person acts as a "computer" following instructions from a second person, who acts as the programmer. Can you, the programmer, direct your partner to successfully stack a series of cups in a particular layout using simple instructions (move up, move down, move forward, move backward, reset)? Explore how to write an algorithm, or sequence of instructions, in this paired activity.

Important Note: The partner acting as the computer can only move the cups and their hand as the programmer directs.



Step 1: Determine a unit of measure such as:
[move up = move up the height of one cup]
[move forward = move the width of half a cup]
[reset = the hand returns to the stack of cups]

Step 2: Determine the final formation for your cup stack. Our suggestion is to start small: a triangle formed by two cups on the bottom and one on top.

Step 3: The "computer" starts at the stack of cups. The programmer can only use the following instructions to code the cup stack:

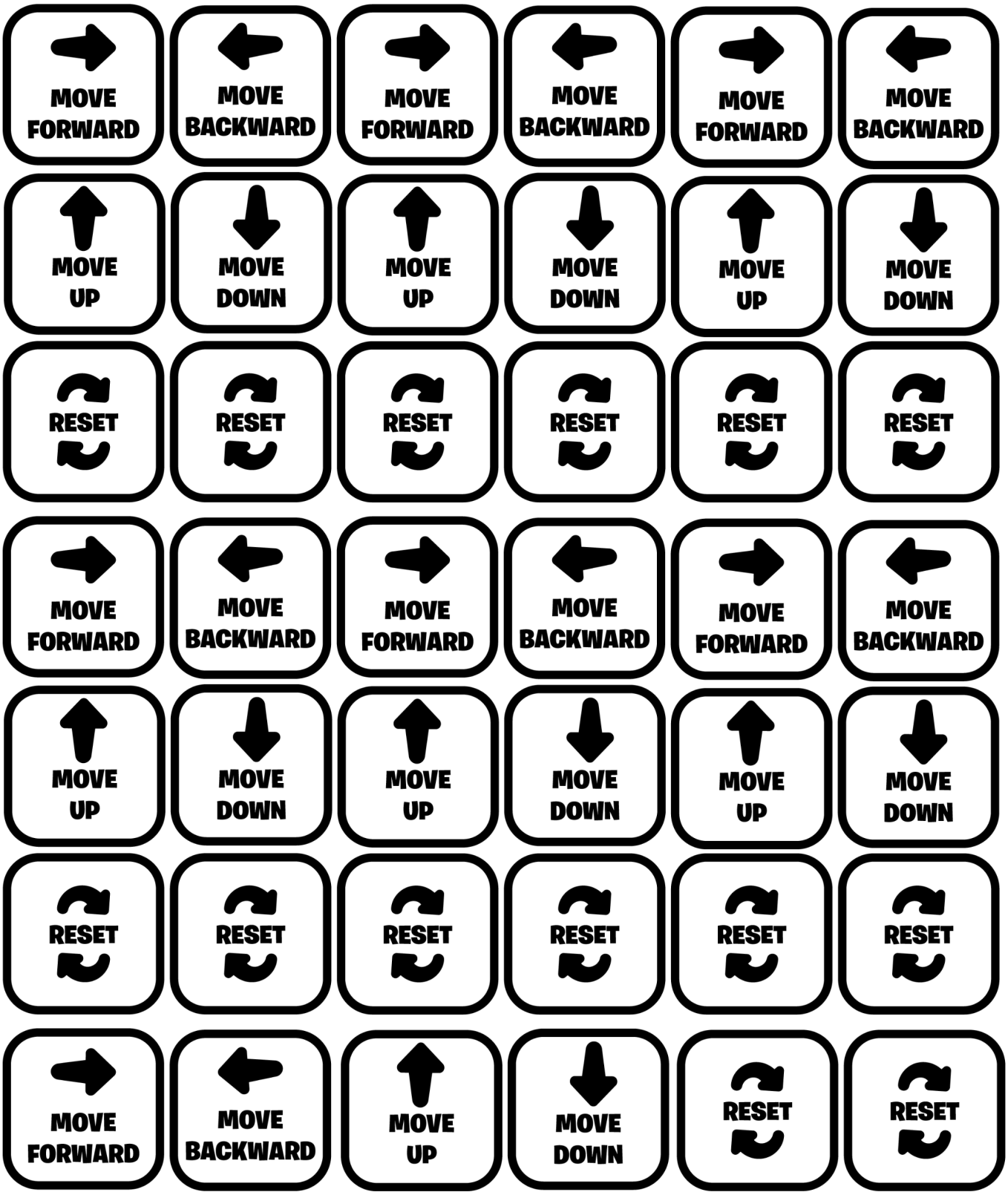
Reset ***Move Up*** ***Move Down*** ***Move Forward*** ***Move Backward***

Using the unit of measure established and the final formation desired, what is the first instruction? 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 instruction sequence (your algorithm) on a table or floor.

Step 4: Once you have completed your instructions, start your program (tell the "computer" to begin) and see if they can follow your algorithm to successfully create the cup stack. 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 to navigate a sprite around the stage. Or add the Pen extension and use blocks like "pen up" and "pen down" in addition to Motion blocks to draw a shape.

Printable Instruction Cards:



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