



# MAZE: FLIP THE ARROW

COMPUTATIONAL THINKING: SEQUENCING, DEBUGGING

*Every child is different. Do what works best for encouraging each child's exploration of this suggested activity.*

## OBJECTIVE OF THIS INVESTIGATION:

Children will navigate a grid maze by following arrows (i.e., a code) to find a hidden treasure.

## VOCABULARY:

- code
- sequence
- error
- debug
- straight
- turn
- left/right

## MATERIALS:

- Painters tape to make grid
- Pieces of printer paper with one large arrow per paper printed or drawn on
- One piece of paper with a "treasure" on it (this could be a sticker or drawing. Something that can't be seen through the paper.)

## PROGRESSION STEPS (COMPUTATIONAL THINKING: SEQUENCING, DEBUGGING):

Visit [STEMIE Learning Trajectories](#) for details

- Complex Sequencer
- Sequence Planner
- Guided Error Recognizer
- Error Identifier
- Early Debugger

## THIS INVESTIGATION:

- Prior to the activity, set up a 2x3 grid with painter's tape on the floor.
- **"Today we are going to be robots and programmers! One person is going to be a robot and one person is going to be a programmer telling the robot how to find a hidden treasure. The trick is that the robot can only move the way the programmer says."**
- Designate one child as the robot and one child as the programmer. It could be helpful to provide a name tag or other visual indicator to help children remember their roles.
- Have the robot hide as the programmer picks a square of the grid to hide the treasure.
- Ask programmer to lay down the arrows in the grid leading to the treasure.

Do children plan their path prior to laying down the set of arrows (**Sequence Planner**)

## ADAPTATIONS:

See [A Guide to Adaptations](#) for general ideas and strategies

### Materials:

- If possible complete the activity on the carpet and add Velcro to arrows and treasure so they don't move when kids step on them.
- Ensure grid is large enough for children to fit their bodies in each square, including if children use adaptive mobility devices such as wheelchairs.





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## THIS INVESTIGATION (CONTINUED):

- Do children sequence the arrows correctly? (**Complex Sequencer**)
- Do they notice any errors that they make? (**Error Identifier**)
- Do they fix any errors found? (**Early Debugger**)
- Carefully turn over all arrows (without reorienting them) so that you can't see the arrows. Add blank paper in all the empty squares that don't have arrows.
- When robot returns, have them start at the designated start spot and turn over the first piece of paper to reveal the arrow/the next move.
- The robot will follow this arrow to the next square and turn over the next piece of paper that the arrow in their square is pointing to.
- Have children continue to turn over each arrow until they reach the treasure.
- If programmer doesn't sequence the arrows correctly, can they catch their error when the robot doesn't make it to the treasure? (**Guided Error Recognizer**) Can they fix the sequence? (**Early Decomposer**)

## ADAPTATIONS (CONTINUED)

### Instruction:

- Provide a visual schedule to help children understand the expectations for the investigation.
- Complete a practice round to demonstrate how the activity works
- Programmer: If children don't sequence the arrows to the treasure and don't see their errors, walk through the maze with them and correct the sequence as you go.
- Robot: If children struggle to follow the direction of the arrows, walk with the robot through the grid as well as labeling the direction the robot should move next.
- Robot: Reduce the grid size or hide the treasure closer to the start to make the sequence fewer steps

## HOW TO CONTINUE THIS INVESTIGATION:

- Ask programmer to program a new sequence to get to the same treasure. (**Early Decomposer**)
- Create a more complicated grid/hide the treasure further from the starting square.
- If children are able to sequence the arrows correctly, challenge them to next time plan the sequence prior to laying their arrows down. (**Sequence Planner**)
- For children who are consistently catching errors in the sequence, try the activity MAZE: DEBUGGING DIRECTIONS