



SNAIL MAZE: DEBUGGING

COMPUTATIONAL THINKING: DEBUGGING

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

OBJECTIVE OF THIS INVESTIGATION:

Children find the error in an adult's code to get a snail through a maze.

VOCABULARY:

- code
- sequence
- debug
- fix
- error

MATERIALS:

- A 2D paper grid maze (attached) Note: Increase or decrease complexity dependent upon children's needs.
- Arrow cards to sequence route through grid maze (attached)
- Blank strip to place arrows in (attached)
- Small animal to lead through the maze (attached)

PROGRESSION STEPS (COMPUTATIONAL THINKING: DEBUGGING):

Visit [STEMIE Learning Trajectories](#) for details

- Guided Error Recognizer
- Error Identifier
- Early Debugger

THIS INVESTIGATION:

- Choose the simplest maze to start and present the activity to children:
 - "This snail wants to get through the garden to her home. Can you help her? We're going to use these directions to help her through." Show arrows.**
 - "But we have to be careful! There are gnomes and bushes and lots of other things in the garden that the snail can't crawl on. That means we can't go on top of these squares. We have to go around."**
 - "I'm going to try to give the snail directions first. Tell me if I did it right."**
- Place a blank strip down to place arrows in, then lay direction arrows out one by one in an INCORRECT order. (Note: Start with one incorrect arrow instead of many.) Here are some things you might notice children do:
 - Children might catch your errors before you even lead the snail through the maze (**Error Identifier**)
 - Children might fix your errors immediately without prompting (**Early Debugger**)
 - Children might not see your errors at all

ADAPTATIONS:

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

Environment:

- Set up on the floor or a table.

Materials:

- Place Velcro on the arrows and snail so children don't knock them off the board.





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THIS INVESTIGATION (CONTINUED):

- If children don't see/fix the error. Lead the snail through the maze following the incorrect directions.
- Can children catch the error after seeing the snail move through the maze?
(Guided Error Recognizer)
- If children still do not see/fix the error, help them see that the snail did not make it to the end of the maze.
"Oh no! The snail didn't make it to her home. There must be something wrong with our directions. Let's fix them." (Guided Error Recognizer)
- If children still do not catch the error, model each action step-by-step slowly and point to each direction in the strip in turn. Ask the child if each direction gets the snail closer to the end of the maze.
- If children still do not catch the error, point out the error yourself. **"Oh no, that's not right! The snail needs to go this way."** And correct the arrow sequence.

ADAPTATIONS (CONTINUED):

- Use a 3D character that is easier to hold and manipulate instead of the 2D snail
- Instruction:**
- Talk through the sequence of directions to get to the end of the maze as the snail is moved. For example, **"Down, left, right."**
 - Talk through why the direction is incorrect while tracing the path of the arrows. **"Hmm, this arrow tells the snail to go this way, but that takes us away from the snail's house. That's not right."**
 - Help children remember/determine the intended outcome: **"What are we trying to help the snail do?"**

HOW TO CONTINUE THIS INVESTIGATION:

- Increase the challenge of the maze
- Increase the number of errors made in the original sequence



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SUPPORT MATERIALS: TWO-STEP MAZE





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SUPPORT MATERIALS: FOUR-STEP MAZE





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SUPPORT MATERIALS: FOUR-STEP MAZE (CHALLENGE)





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SUPPORT MATERIALS: SIX-STEP MAZE





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SUPPORT MATERIALS: MULTIPLE PATHS MAZE 1



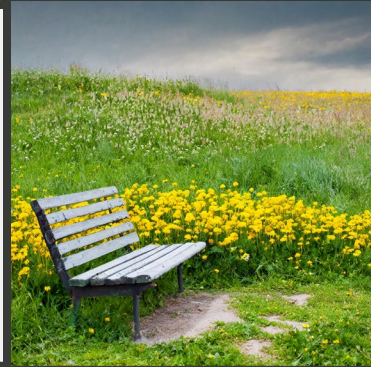


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SUPPORT MATERIALS: MULTIPLE PATHS MAZE 2





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SUPPORT MATERIALS: 2X2 GRID



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SUPPORT MATERIALS: 3X3 GRID



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SUPPORT MATERIALS: 4X4 GRID



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SUPPORT MATERIALS: SEQUENCE STRIPS

Two Step Maze Sequence Strip

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Three Step Maze Sequence Strip

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SUPPORT MATERIALS: SEQUENCE STRIPS

Four Step Maze Sequence Strip

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Six Step Maze Sequence Strip



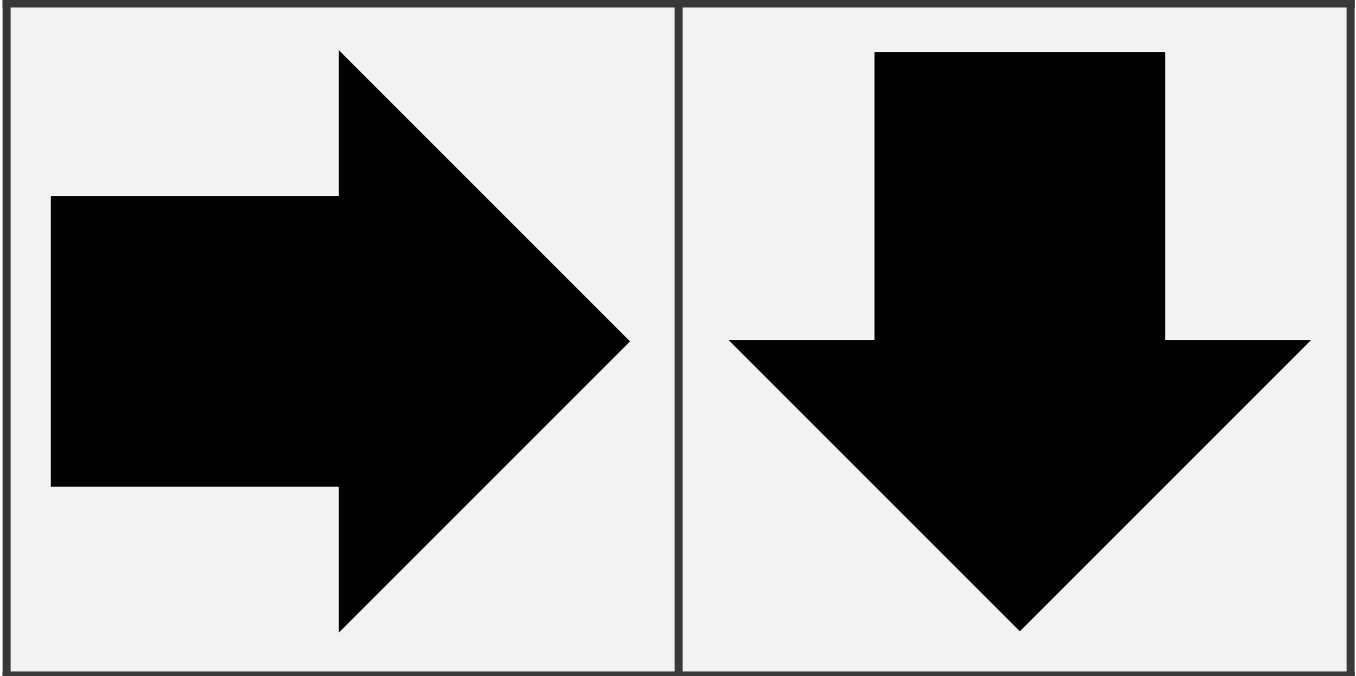
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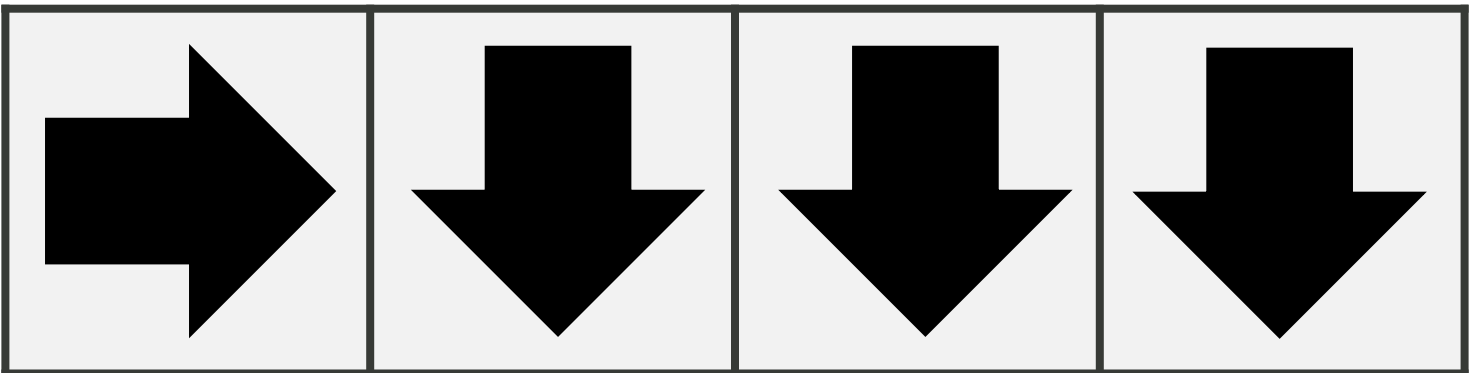
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SUPPORT MATERIALS: SEQUENCE STRIPS WITH ARROWS

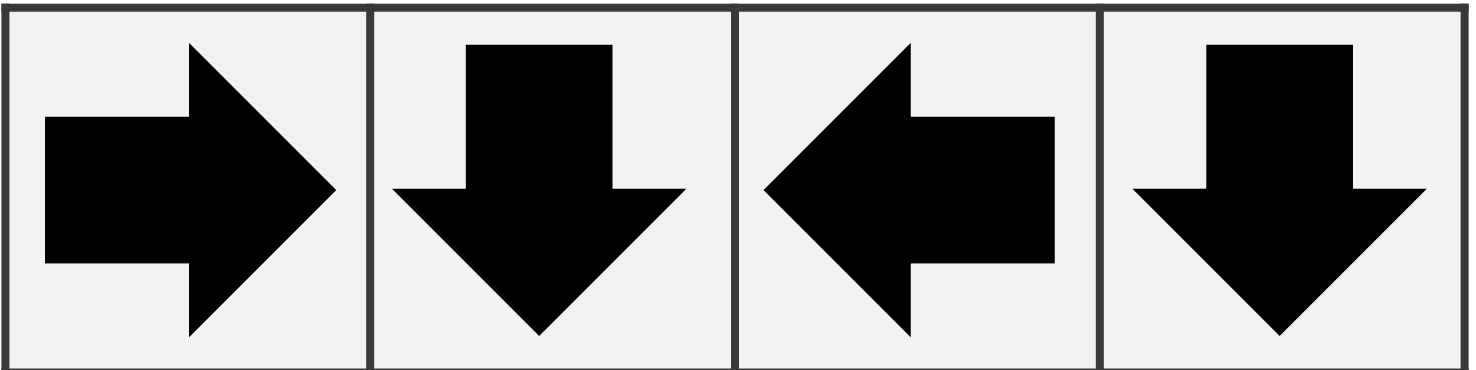
Two Step Maze Sequence Strip



Four Step Maze Sequence Strip



Four Step Maze (Challenge) Sequence Strip





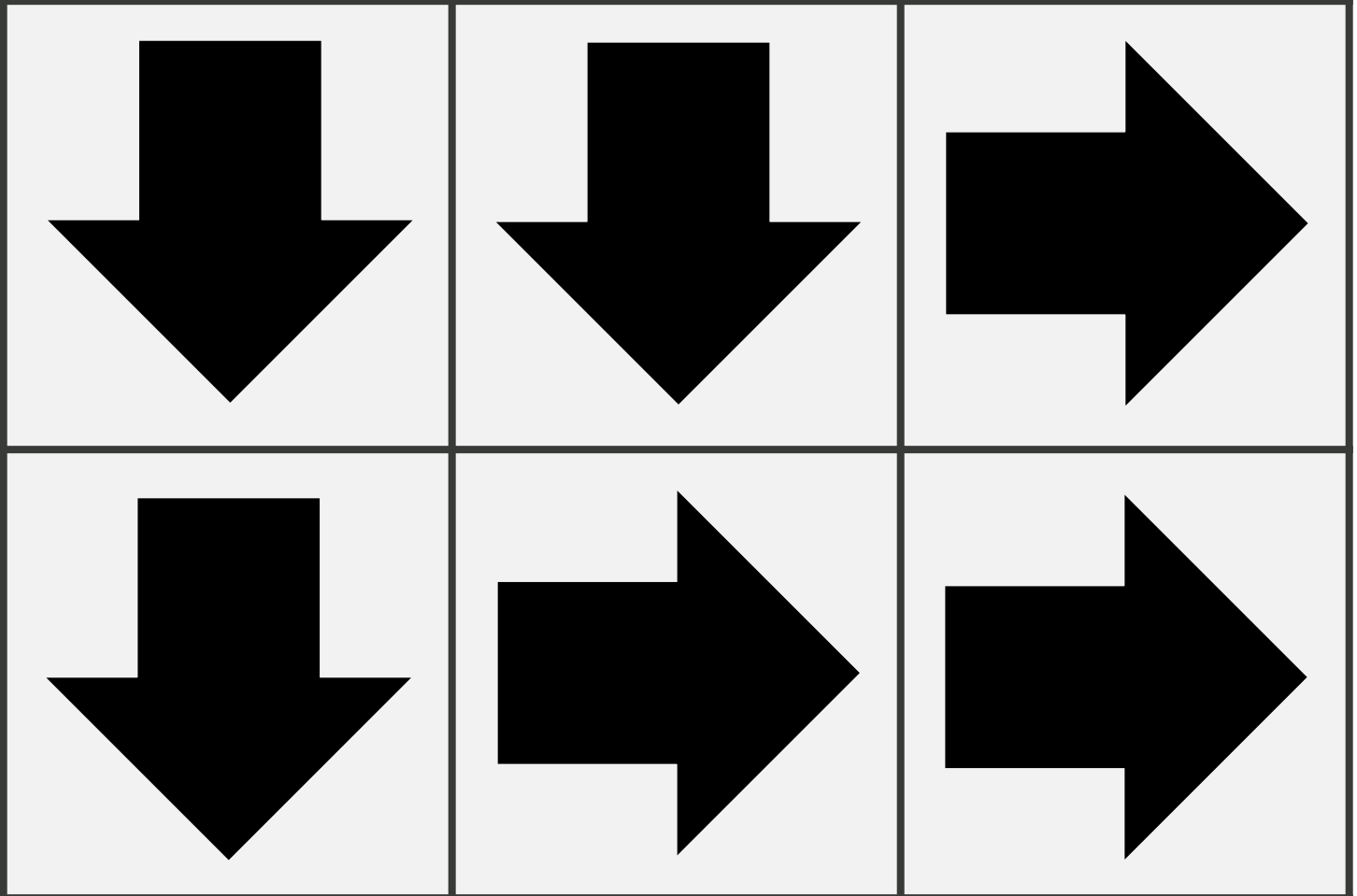
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SUPPORT MATERIALS: SEQUENCE STRIPS WITH ARROWS

Six Step Maze Sequence Strip





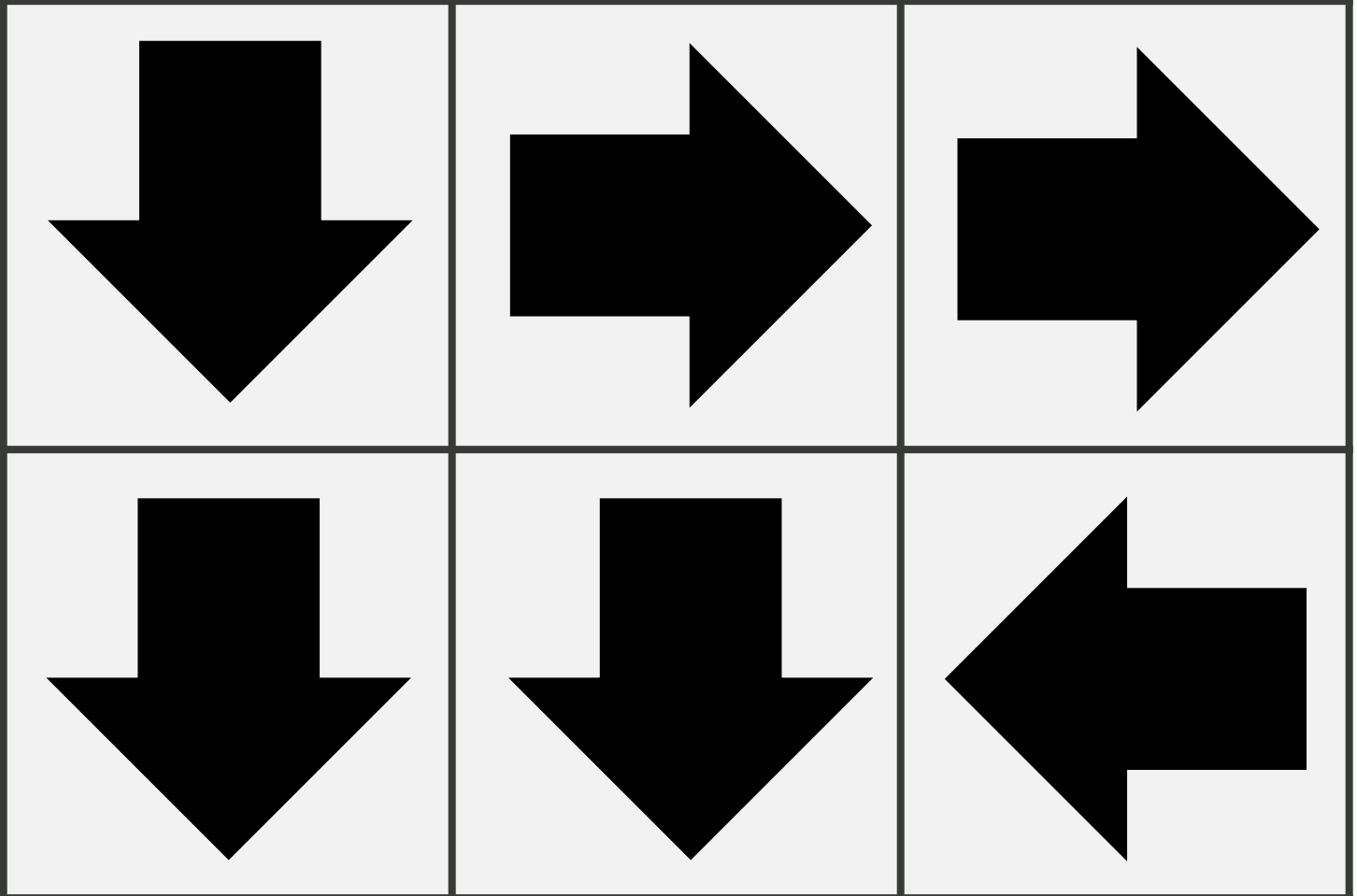
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SUPPORT MATERIALS: SEQUENCE STRIPS WITH ARROWS

Multiple Path Maze 1 Sequence Strip





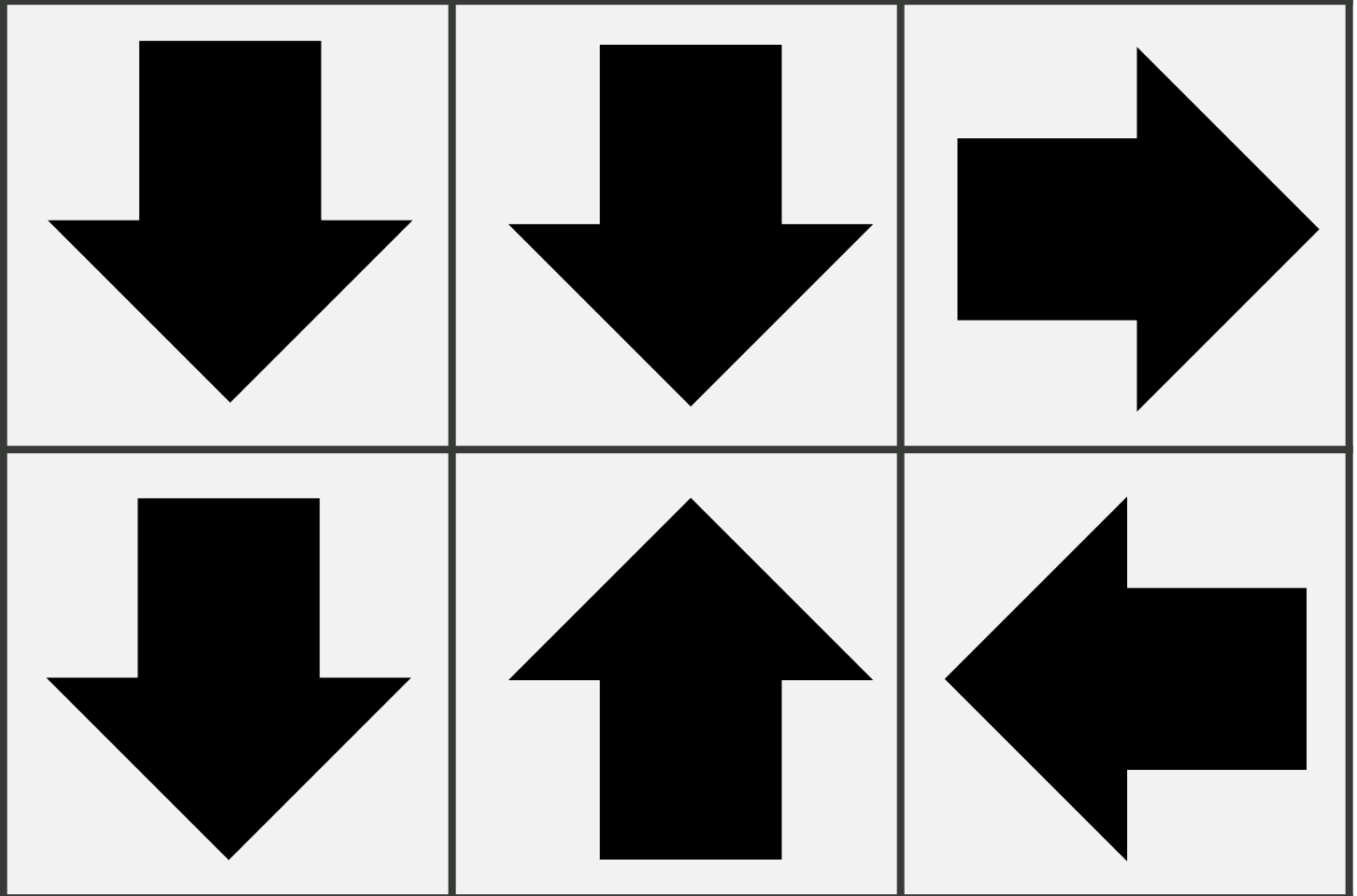
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SUPPORT MATERIALS: SEQUENCE STRIPS WITH ARROWS

Multiple Path Maze 2 Sequence Strip



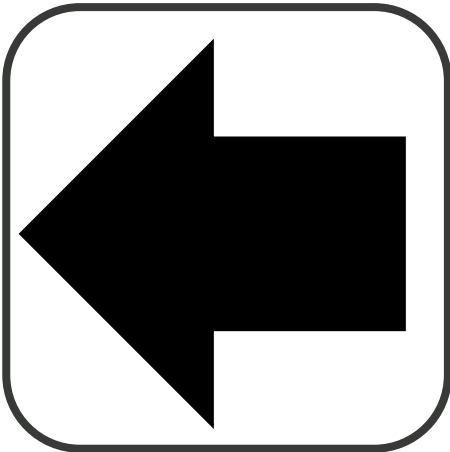
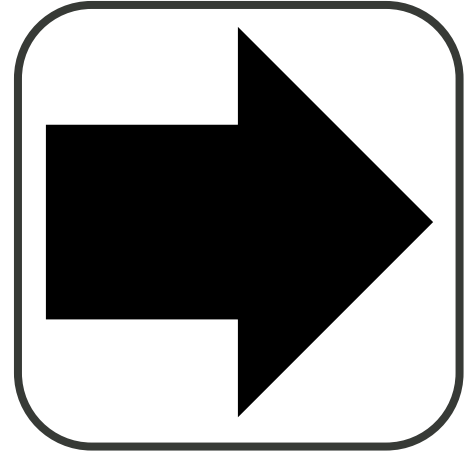
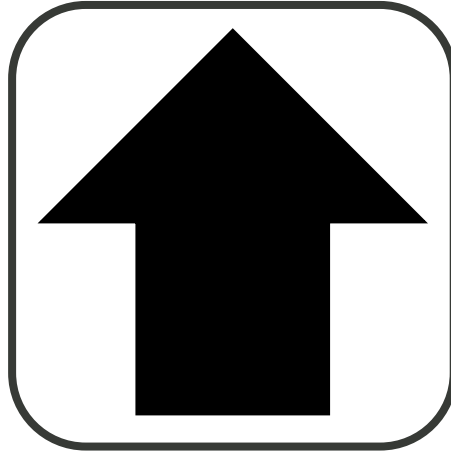
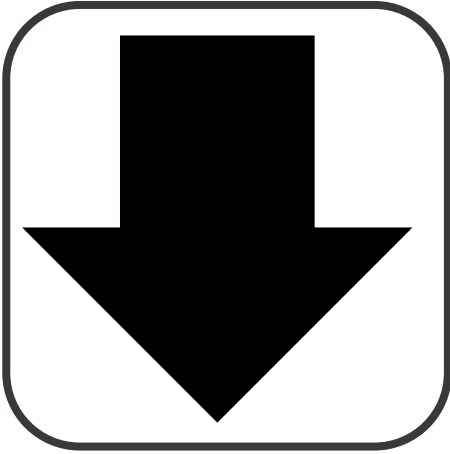


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SUPPORT MATERIALS:



Garden gnome



Flowers



Mushrooms



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SUPPORT MATERIALS:

Use the blank one to make your own!



Bench



Snail

