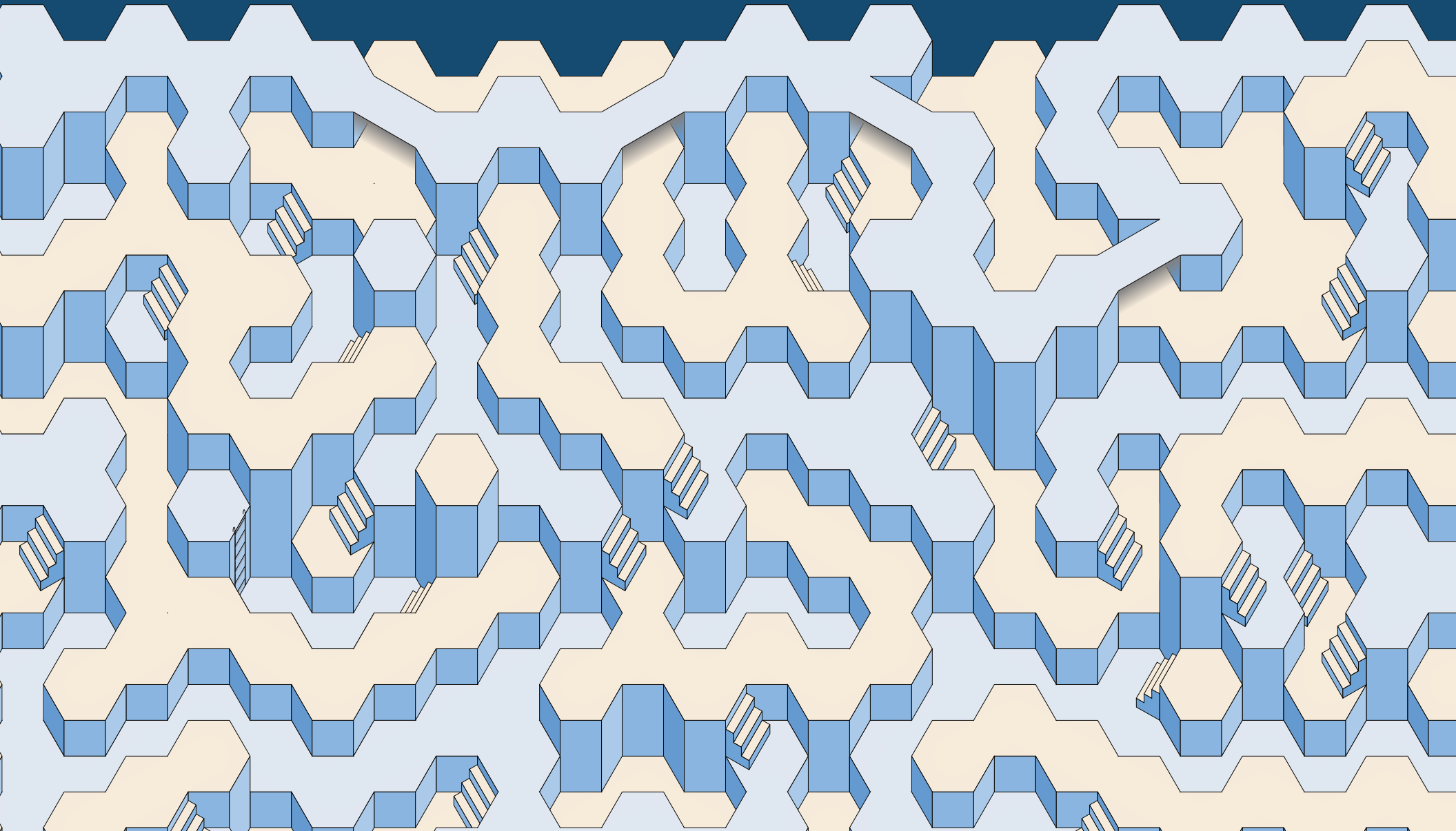
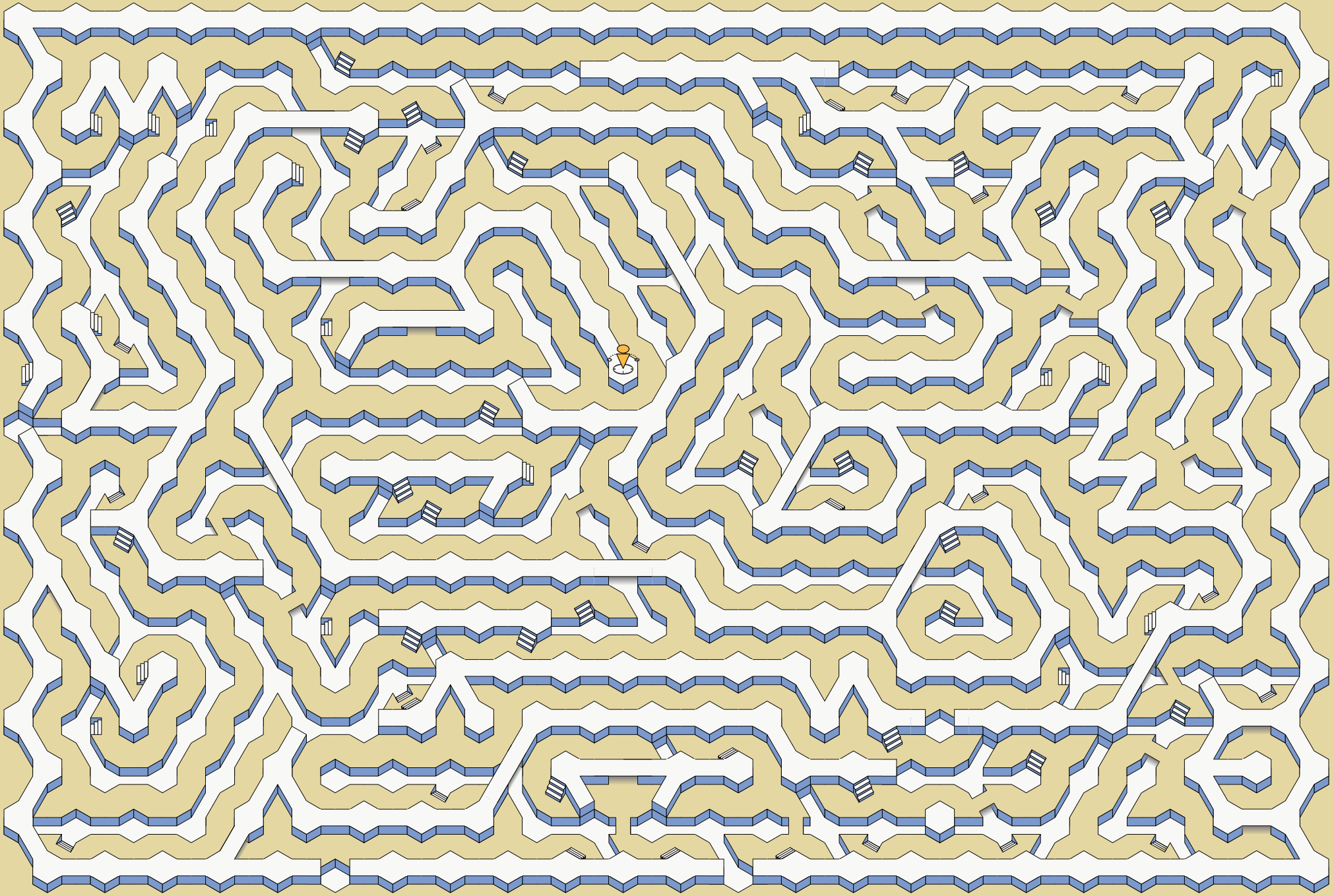
2023

3D-Maze Calendar



Escape the maze!

Start at and work your way through the maze to the exit. Keep a sharp eye out for stairways and underpasses. Good luck!



JANUARY

2023

December 2022

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

February 2023

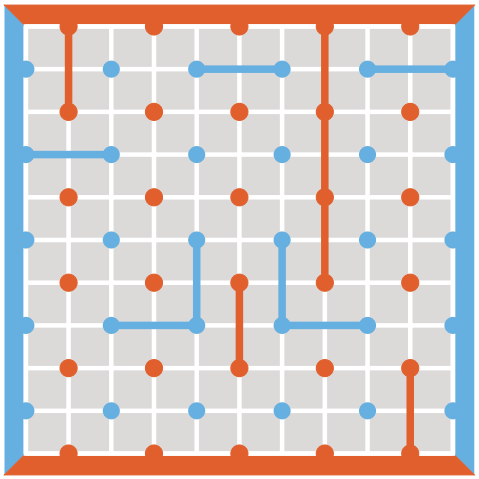
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 New Year's Day	2 Science Fiction Day	3	4	5	6	7
8	9	10	11	12	13	14
15	16 Martin Luther King Jr. Day	17 Kid Inventors Day	18	19	20	21
22	23	24	25	26	27	28
29 Puzzle Day	30	31				

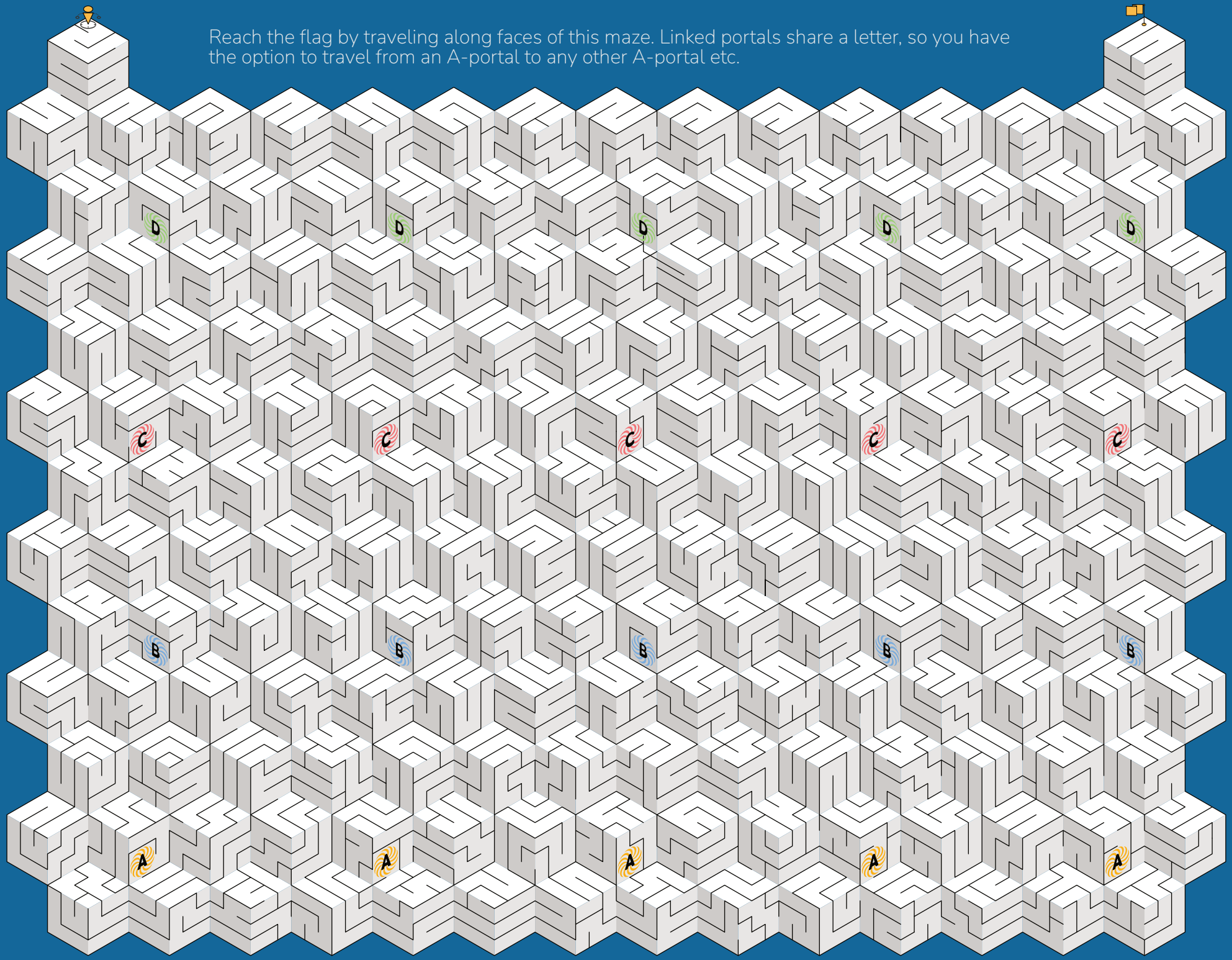
Bridg-It

In the game of Bridg-It, players alternate turns drawing line segments between dots of their own color. The first player to connect their sides with a continuous path is the winner.

Below is a partially completed game of Bridg-It. Which player will win if both players play the best possible moves from here on out?



Reach the flag by traveling along faces of this maze. Linked portals share a letter, so you have the option to travel from an A-portal to any other A-portal etc.



FEBRUARY

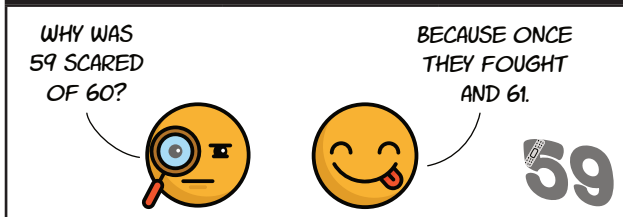
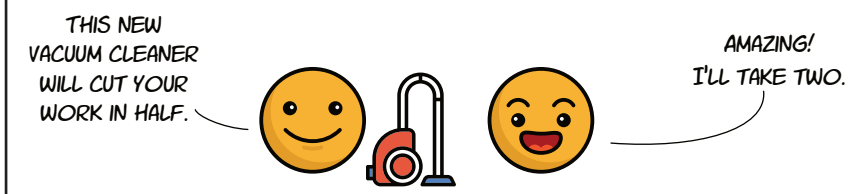
2023

January 2023

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

March 2023

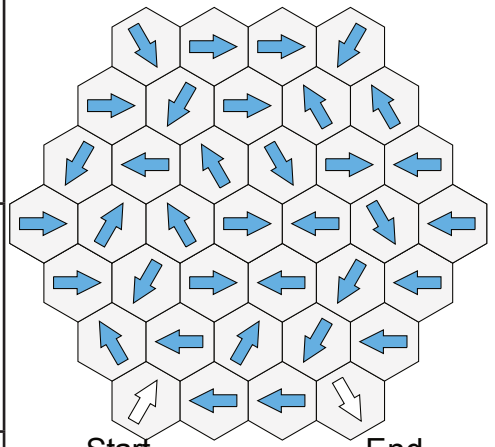
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2 Groundhog Day	3	4
5	6	7 Periodic Table Day	8	9 National Pizza Day	10	11
12	13	14 Valentine's Day	15	16	17	18
19	20 Presidents' Day	21	22	23	24	25
26	27	28				

Arrow Maze

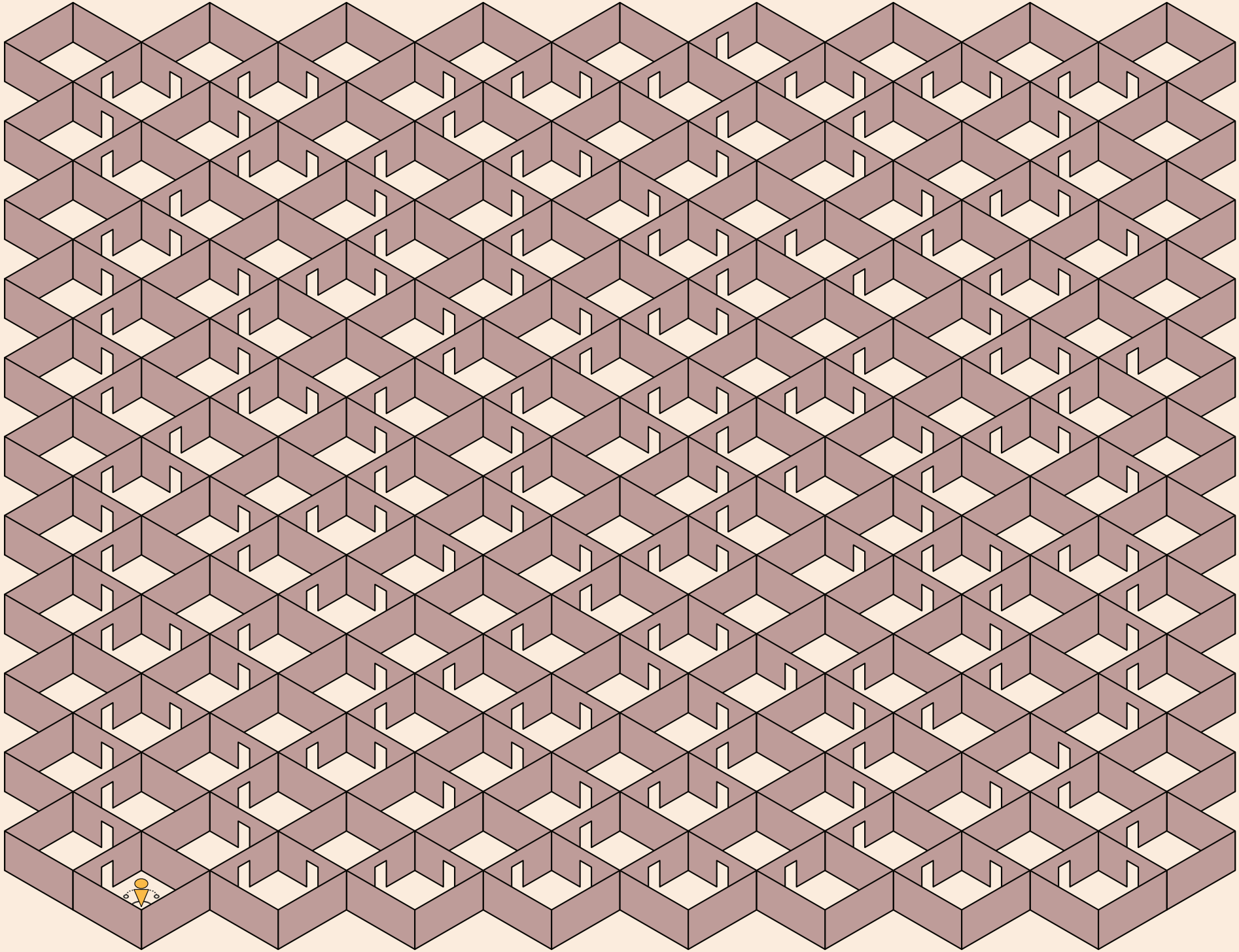
Complete the maze by following the arrows. You must land on a hexagon each move, and you must exit the hexagon in the direction of the arrow. However, you may jump over any number of hexagons each time you move.

Find a path from Start to End!



Start End

Escape the maze! Start at and work your way through the maze to the exit. Good luck!



MARCH

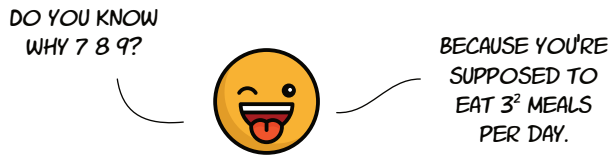
2023

February 2023

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

April 2023

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7 ○	8	9	10	11
12 Daylight Saving Time Begins	13	14 ◑ Pi Day	15	16	17 St. Patrick's Day	18
19	20 Vernal Equinox	21 ●	22	23	24	25
26	27	28 ◐	29	30	31	

Counting Maze

In this maze you always travel horizontally or vertically by choosing a direction and taking exactly the number of steps in the cell you have landed in. You are not allowed to exit the 6×6 square.

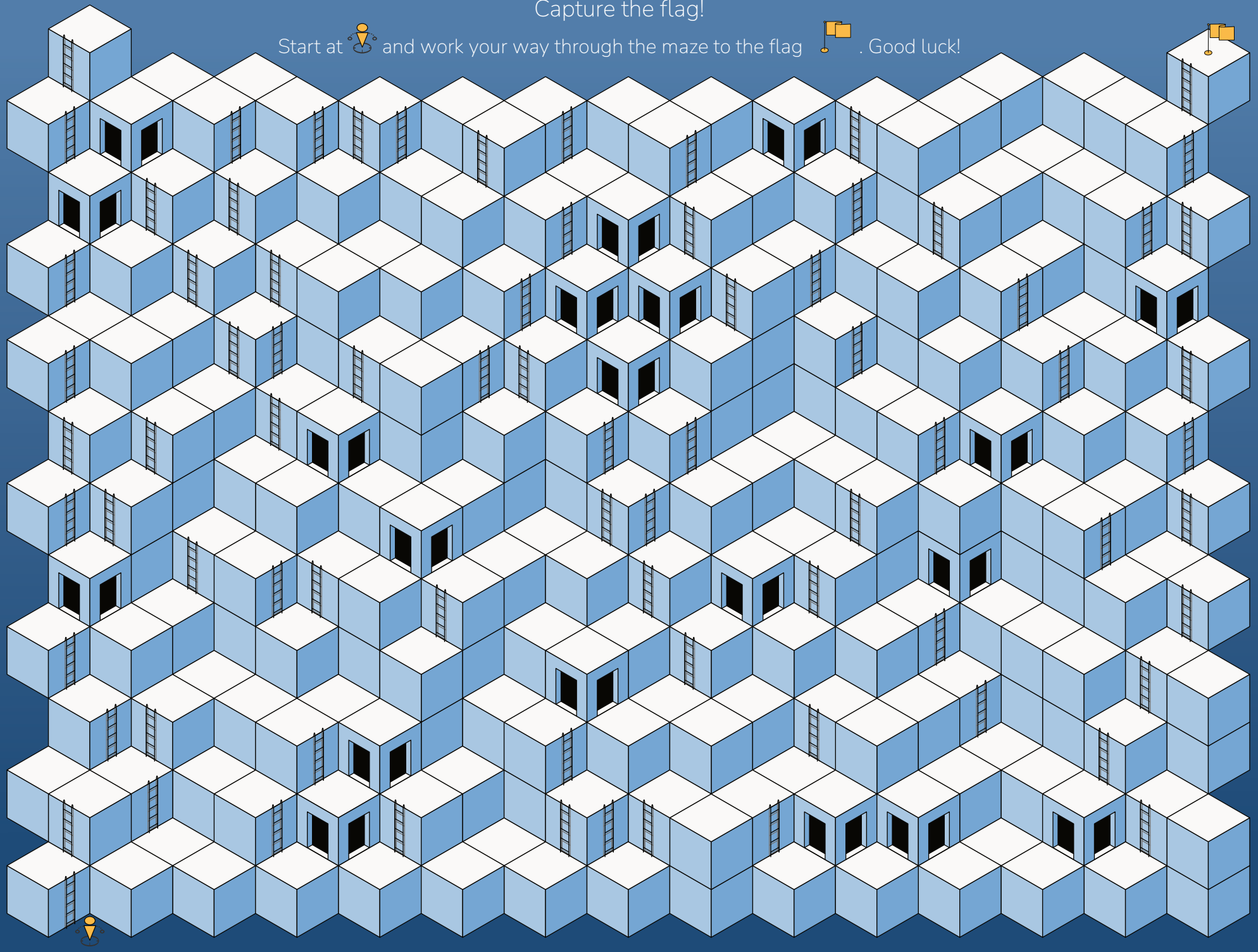
For example, from the top right square, you can take either 2 steps down or 2 steps left.

Start in the upper left square and end in the lower left square.

START 3	3	2	2	2
3	2	3	2	3
1	3	2	2	3
3	1	2	3	4
END ★	2	3	2	3

Capture the flag!

Start at and work your way through the maze to the flag . Good luck!



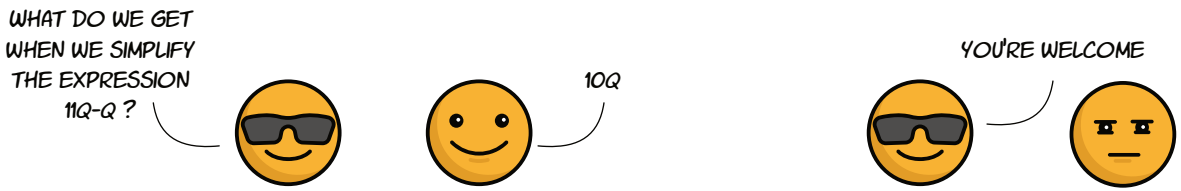
APRIL
2023

March 2023

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

May 2023

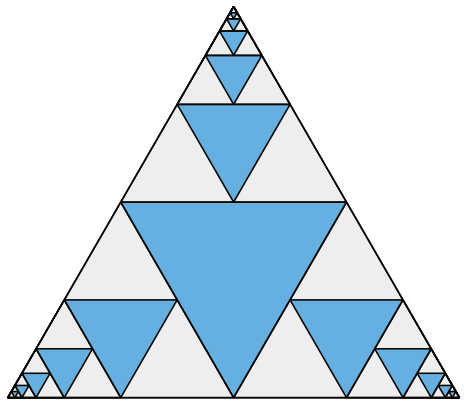
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 April Fool's Day
2	3	4	5	6	7	8
9 Easter	10	11 National Pet Day	12	13	14	15
16	17	18	19	20	21	22 Earth Day
23 30	24	25 DNA Day	26	27	28	29

Triangles Outward

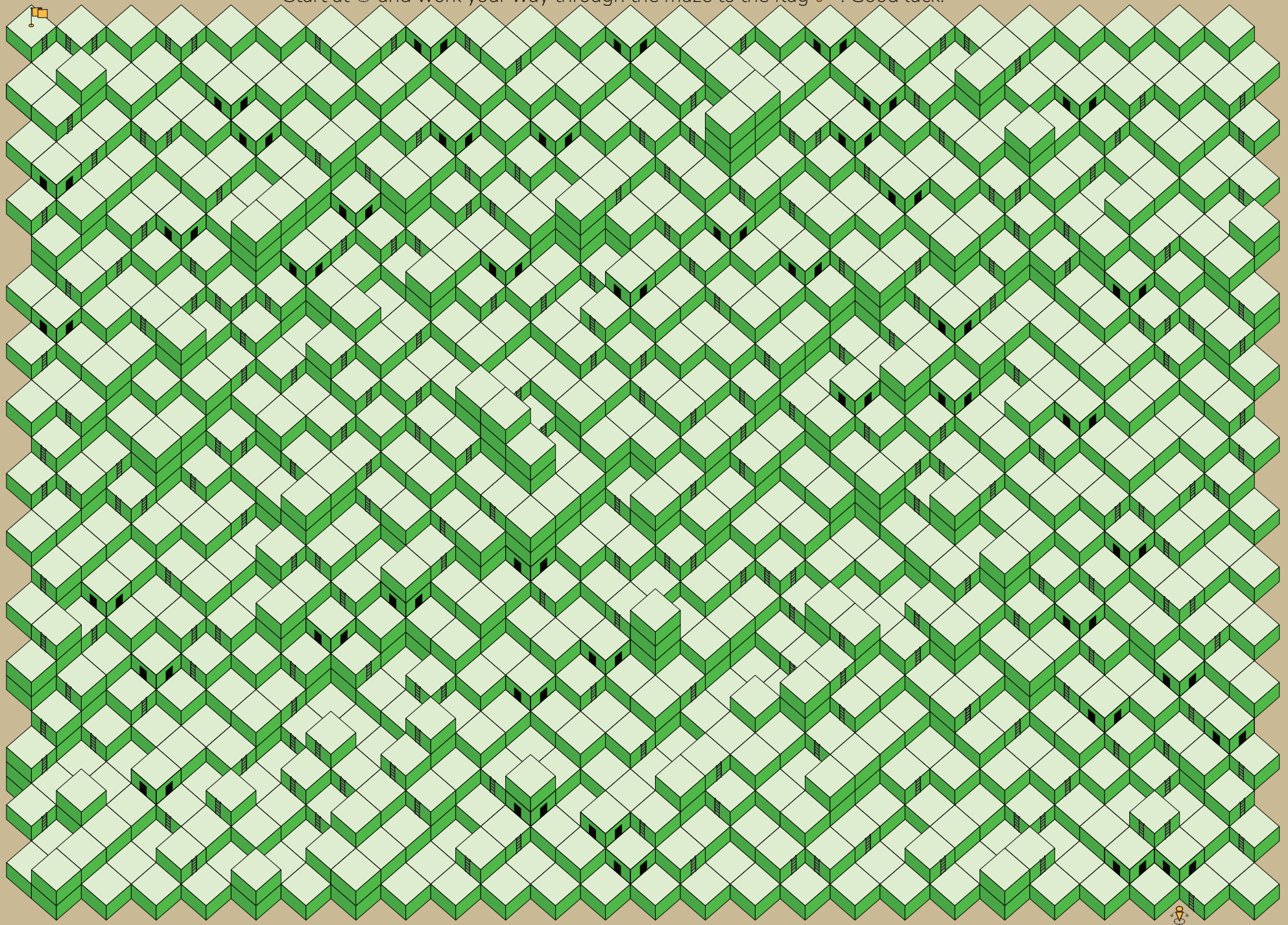
Equilateral triangles are inscribed inside an equilateral triangle radiating outward from the center as pictured. Each of the point-down triangles is shaded blue.

What portion of the big triangle is shaded?



Capture the flag!

Start at and work your way through the maze to the flag . Good luck!



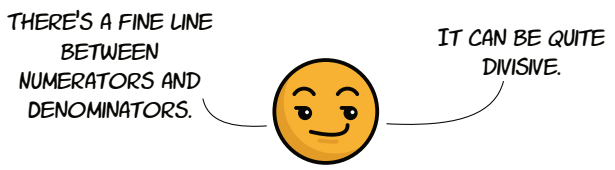
MAY
2023

April 2023

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

June 2023

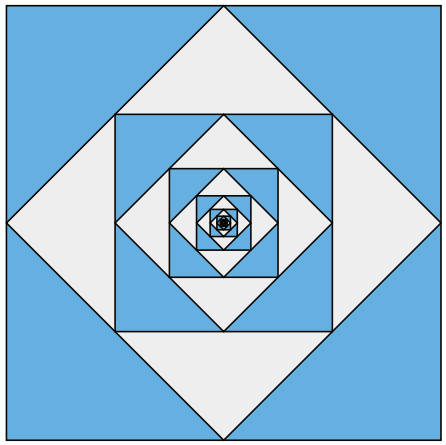
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4 Star Wars Day	5	6
7	8	9	10 Clean Your Room Day	11	12	13
14 Mother's Day	15	16	17	18	19 Bike to Work Day	20
21	22	23	24	25	26	27
28	29 Memorial Day	30	31			

Square Flower

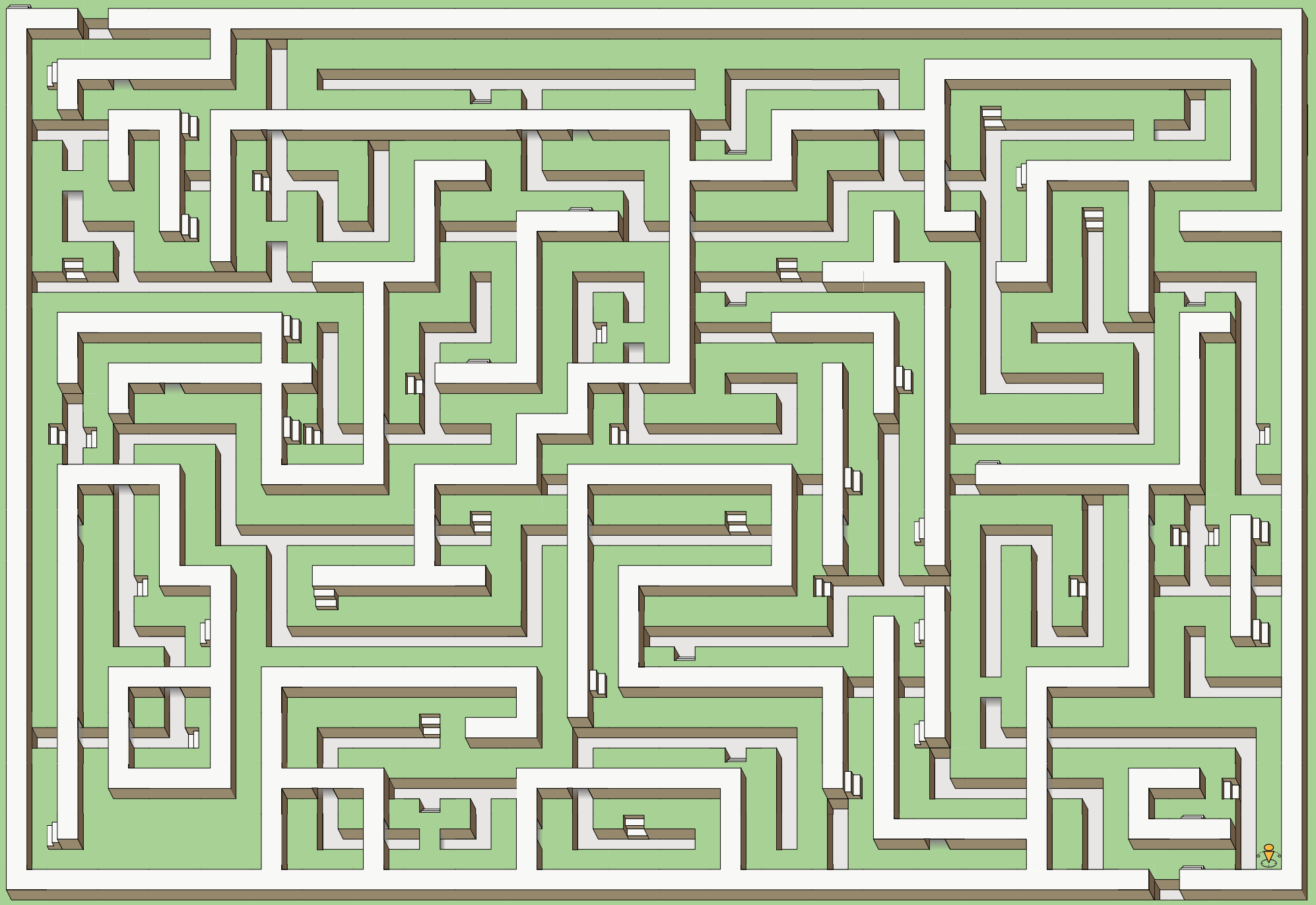
A sequence of inscribed squares is formed by joining the midpoints of a the sides of a square. The squares alternate in color from blue to gray as pictured below.

What portion of the original square is shaded blue?



Escape the maze!

Start at and work your way through the maze to the escape in the upper left corner. Good luck!



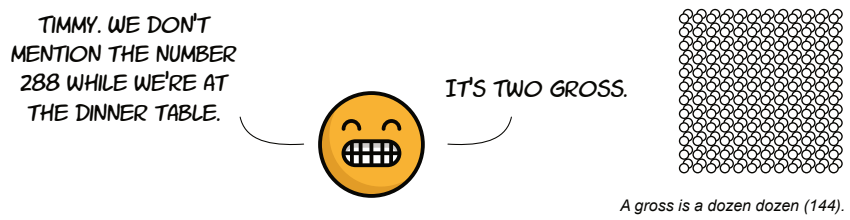
JUNE
2023

May 2023

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

July 2023

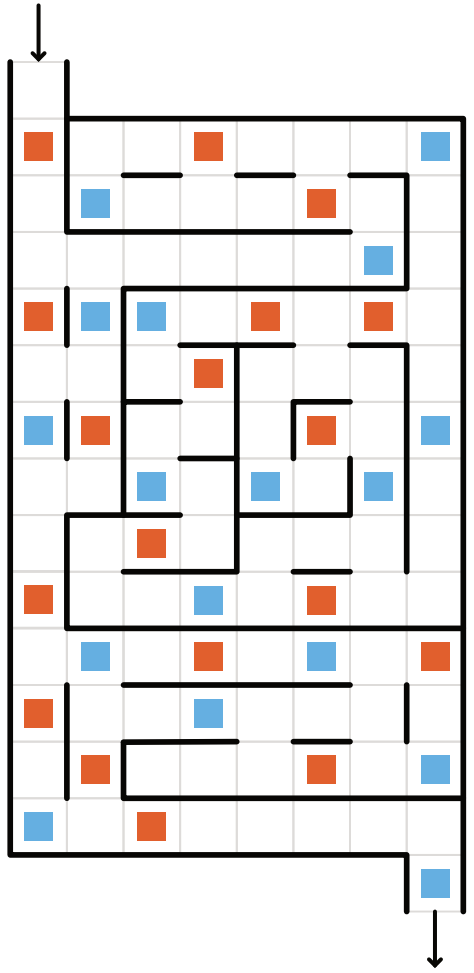
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			*A gross is a dozen dozen (144).*	1	2	3 World Bicycle Day
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18 Father's Day	19 Juneteenth	20	21 Summer Solstice	22	23	24
25	26	27	28 Tau Day	29	30	

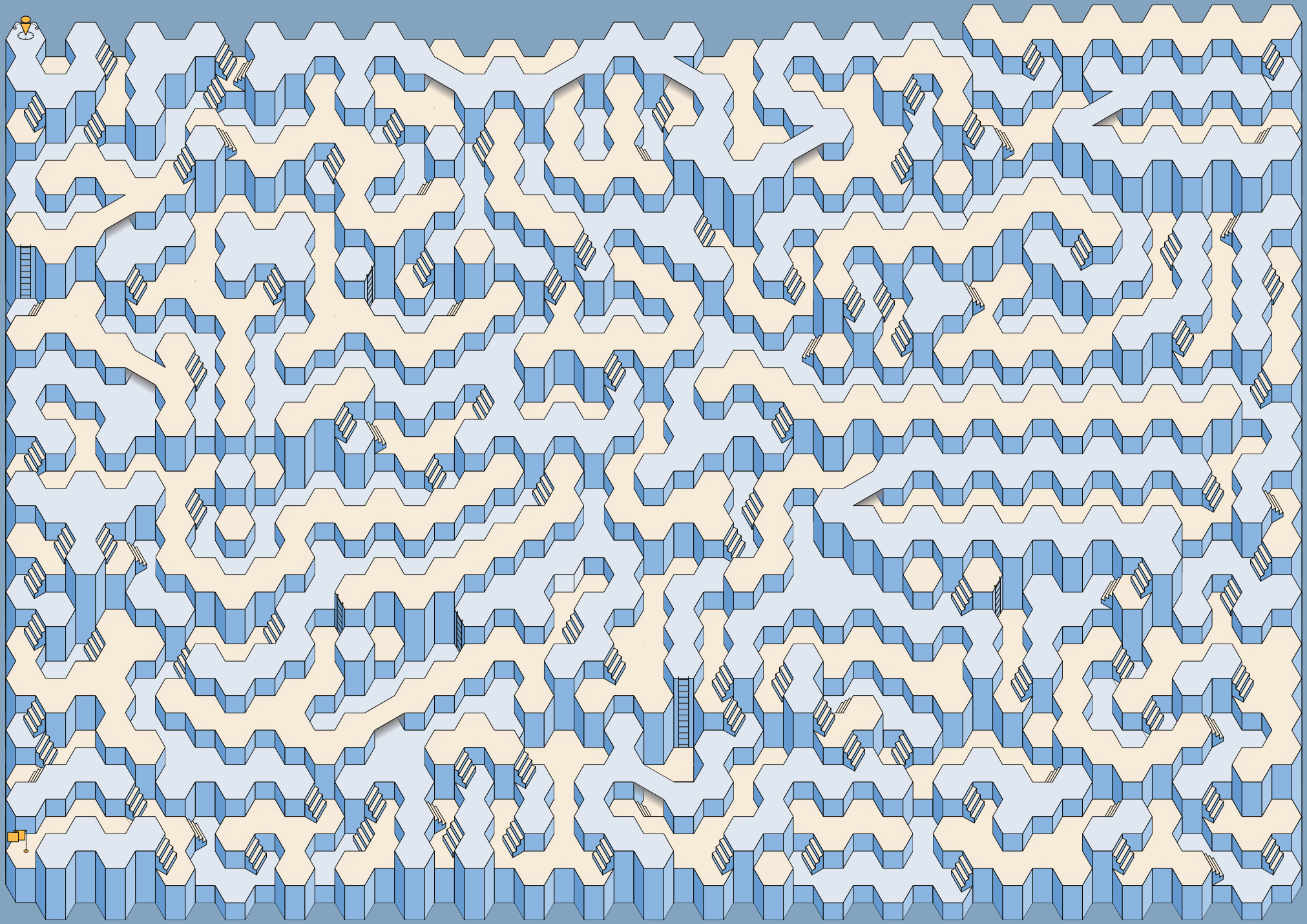
Alternating Color Maze

In this maze, you pass by red and blue checkpoints, but you are not allowed to pass by the same color of checkpoint twice in a row.

Work your way from the top to the bottom. (You may not turn around at a checkpoint, though you can pass through a checkpoint more than once.)



Capture the flag! Start at and make your way to . Watch out for underpasses and ladders along the way.



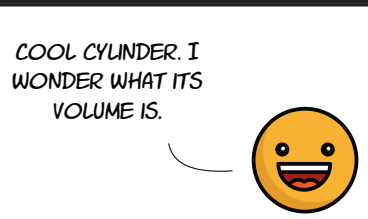
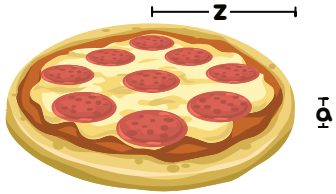
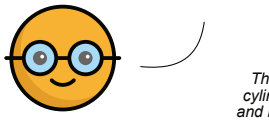
JULY
2023

June 2023

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

August 2023

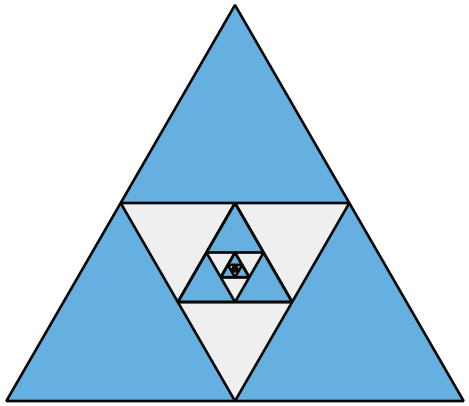
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				 *The volume of a cylinder of radius r and height h is $\pi r^2 h$.*		**1**
2	**3**	**4** Independence Day	**5**	**6**	**7**	**8**
9	**10**	**11**	**12**	**13**	**14**	**15**
16	**17**	**18**	**19**	**20** International Chess Day	**21**	**22**
23 Parents' Day	**24**	**25**	**26**	**27**	**28**	**29**
30	**31**					

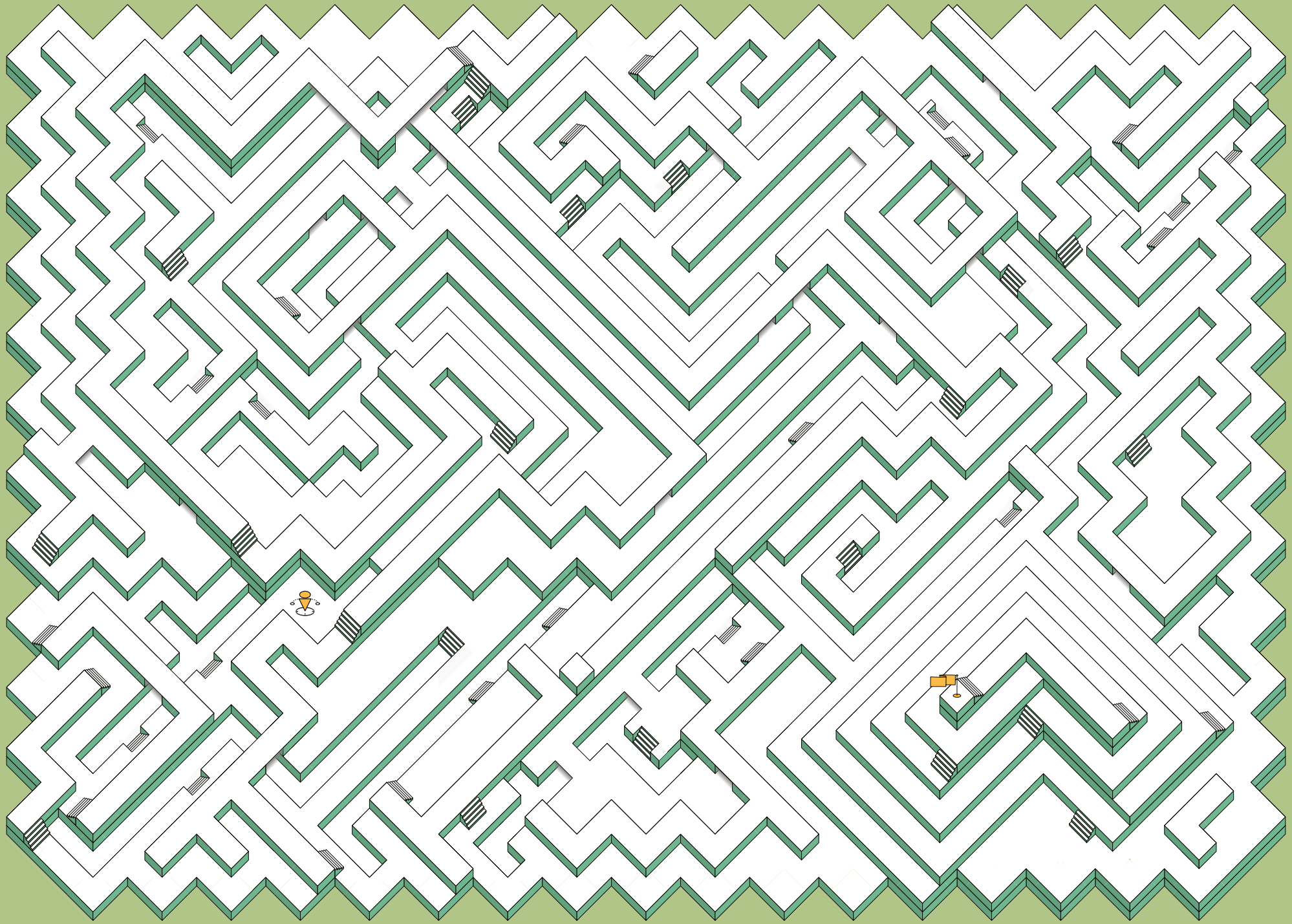
Blue Triangles Inward

A sequence of triangles is formed by successively inscribing equilateral triangles as pictured below. Then any point-up triangles are shaded blue.

What portion of the original triangle is shaded?



Reach the flag! Start at and work your way through the maze to the flag . Watch out for stairs and overpasses. Good luck!



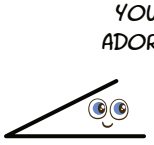
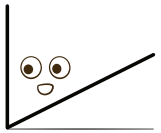
AUGUST
2023

July 2023

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September 2023

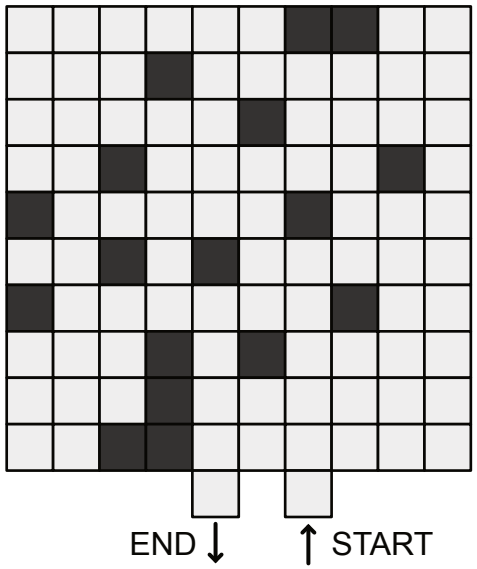
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4 National Chocolate Chip Cookie Day	5
6	7	8 Infinity Day	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	 A cute Angle	 Complimentary Angle

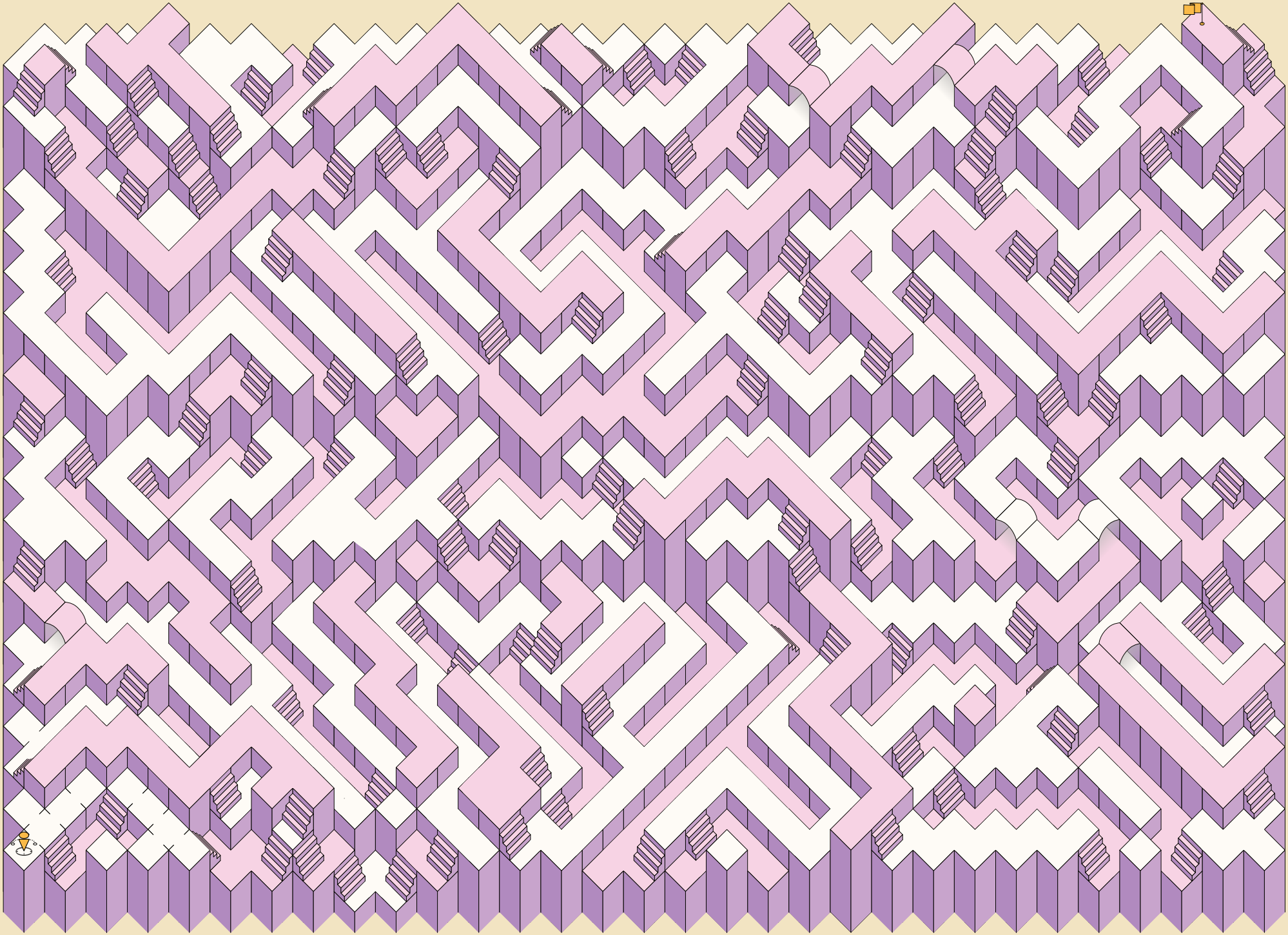
No-Left-Turn Maze

In this maze you travel from square to square, but you are only allowed to go straight or turn 90° right. The dark squares are obstacles that block the path. Go from START to END to complete the maze.

If you get stuck, go back to the beginning and try again.



Reach the flag! Start at and work your way through the maze to the flag . Watch out for stairs and overpasses. Good luck!



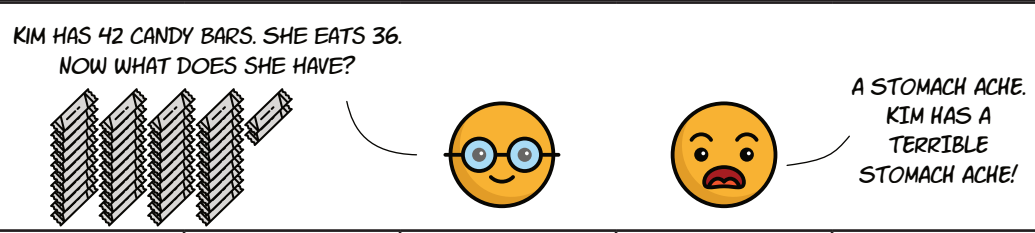
SEPTEMBER
2023

August 2023

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

October 2023

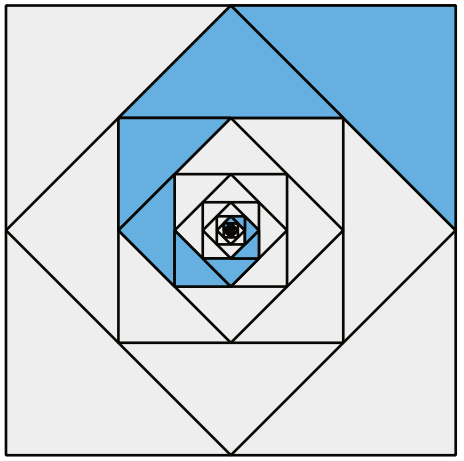
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4 Labor Day	5	6	7	8	9
10 National Grandparents Day	11	12	13	14	15	16
17	18	19 National Talk Like a Pirate Day	20	21	22	23 Autumnal Equinox
24	25	26	27	28	29	30

Triangle Tentacle

A sequence of inscribed squares is partially shaded along adjacent triangles as pictured below.

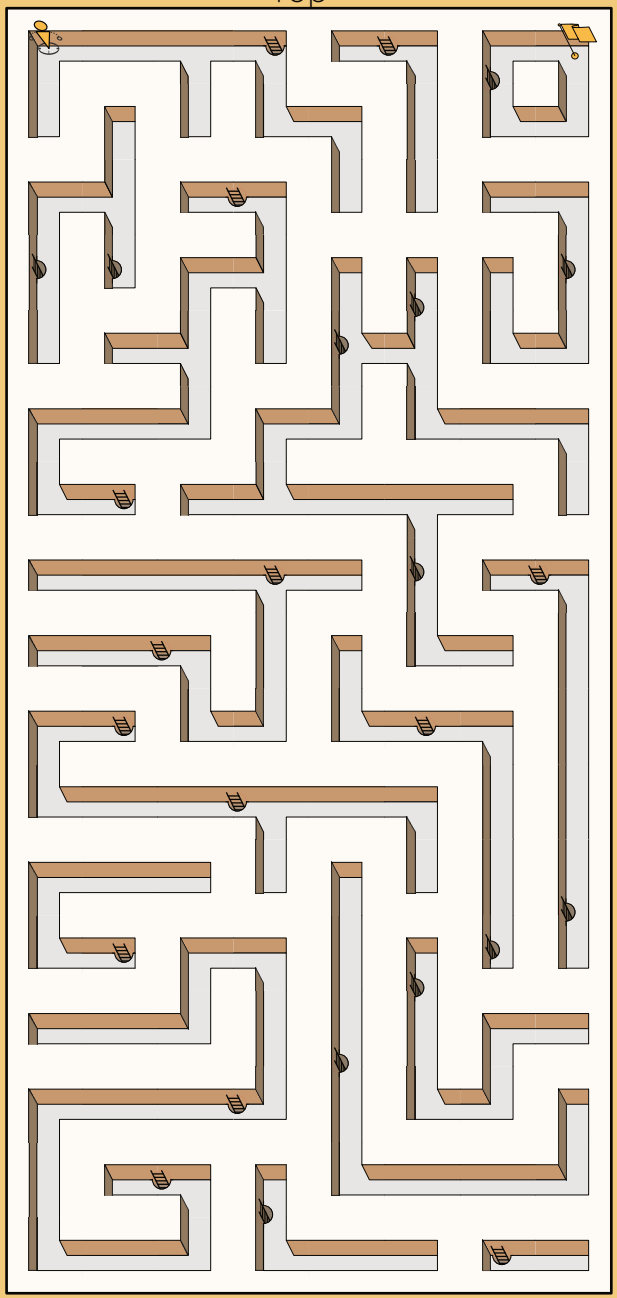
What portion of the big square is shaded?



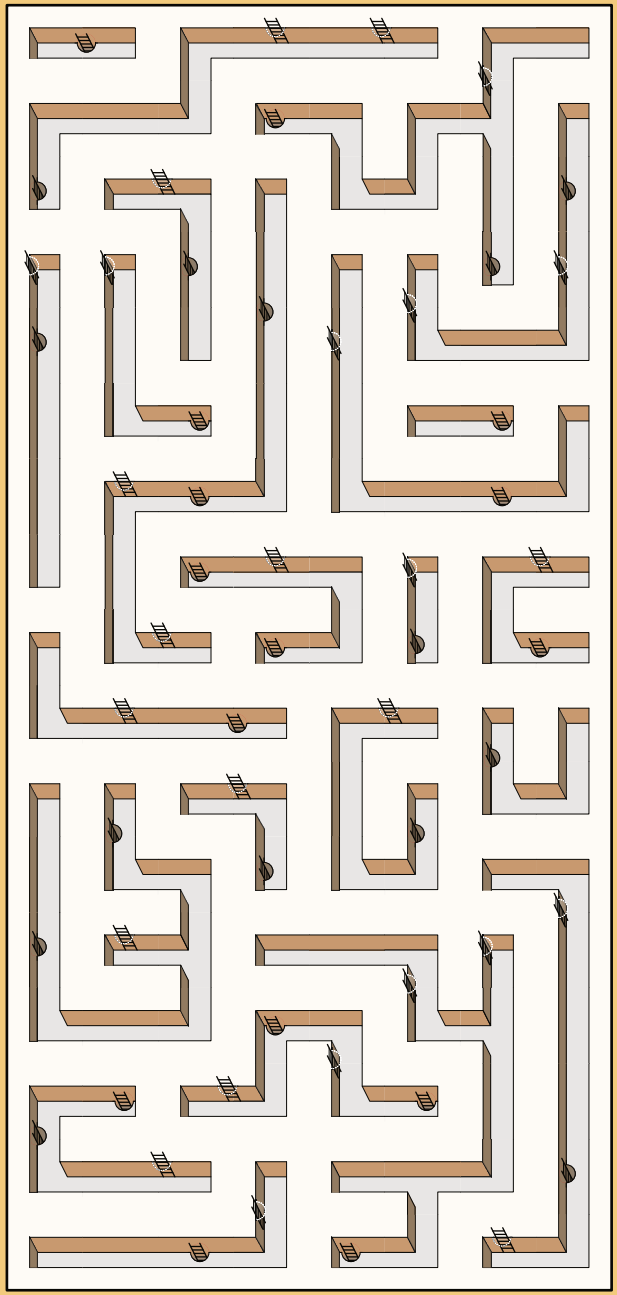
Reach the flag!

Start at and work your way through the maze to the flag. Use the ladders to travel between levels. Good luck!

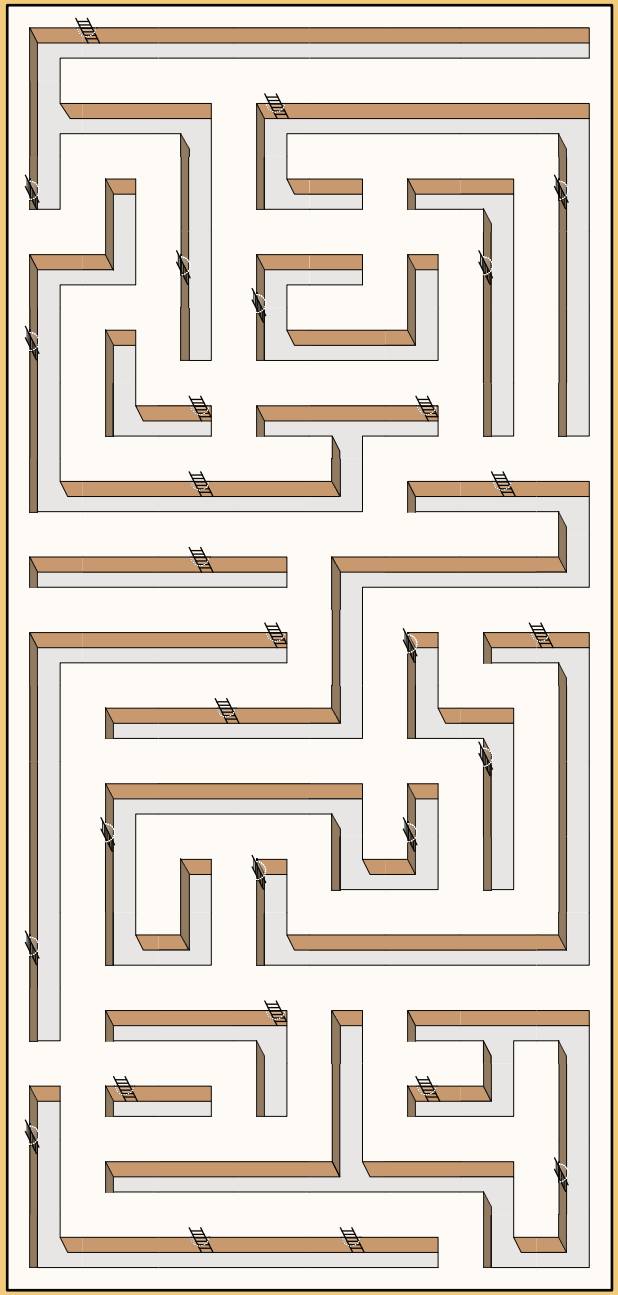
Top



Middle



Bottom



OCTOBER

2023

September 2023

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

November 2023

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4 National Taco Day	5 World Teachers' Day	6	7
8	9 Indigenous People's Day	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31 Halloween				

WHY DO MATHEMATICIANS OFTEN MIX UP HALLOWEEN AND CHRISTMAS?

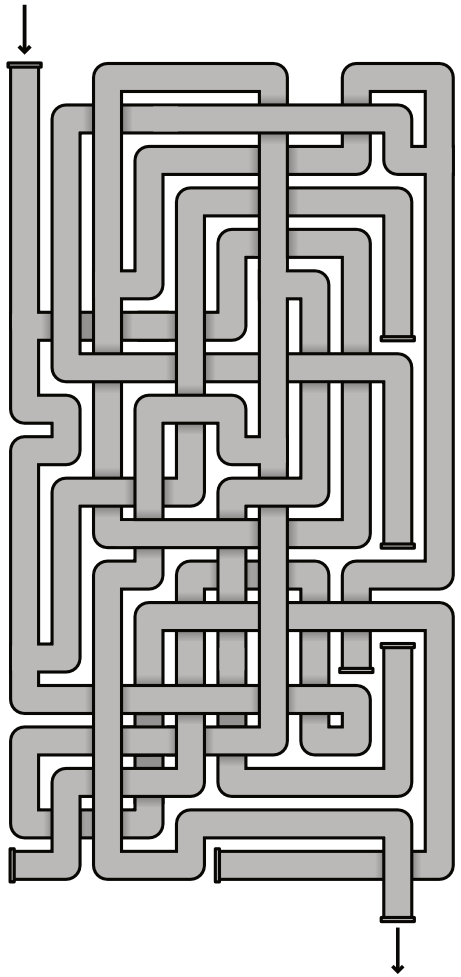
BECAUSE

OCT 31 = DEC 25

In base 8 (octal) the number 31 means three 8s and one 1 for a total of 25 in base 10 (decimal).

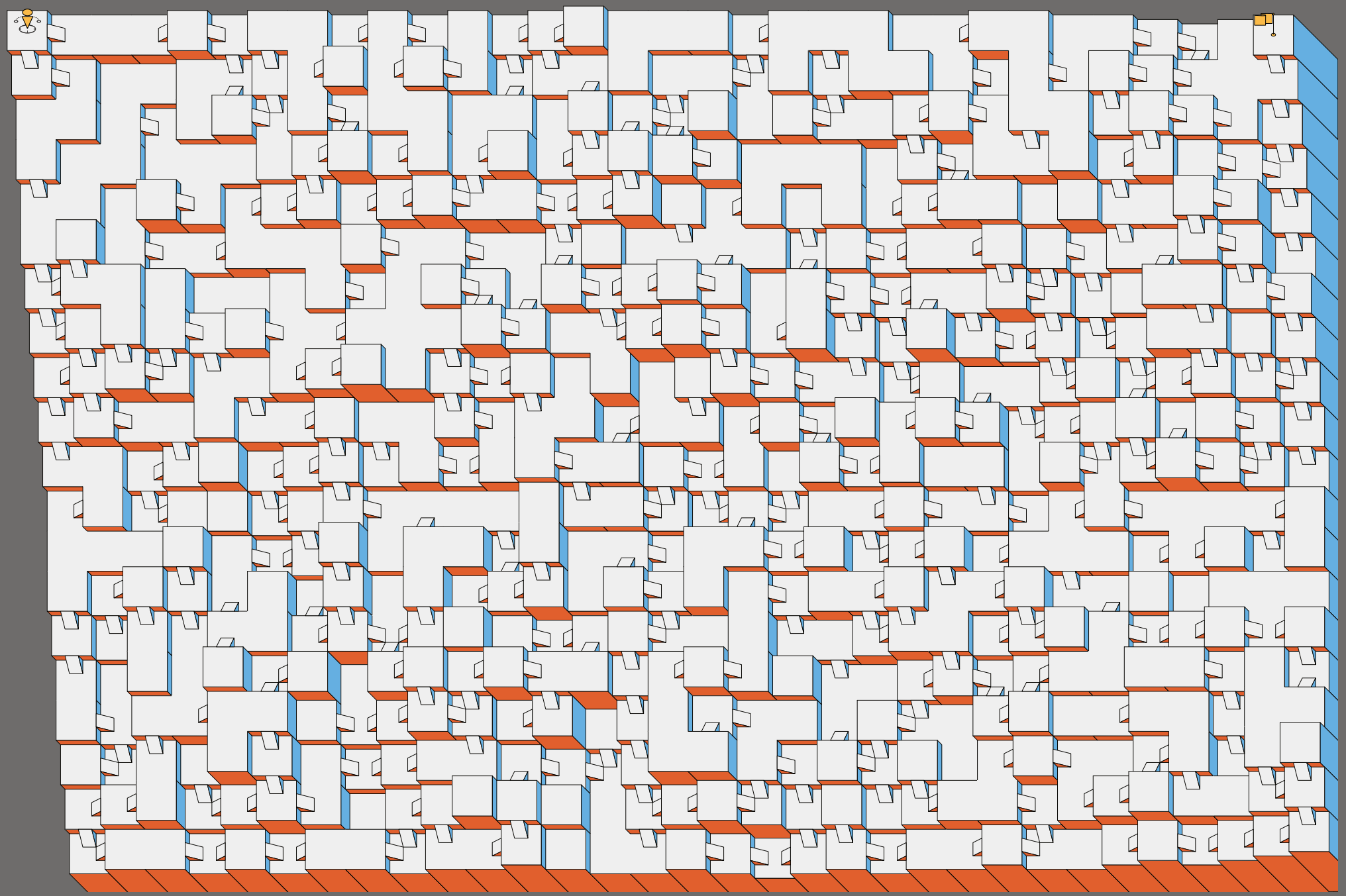
Pipe Maze

Work your way form the top to the bottom.



Reach the flag!

Start at and work your way through the maze to the flag . Use the ramps to travel between levels. Good luck!



NOVEMBER

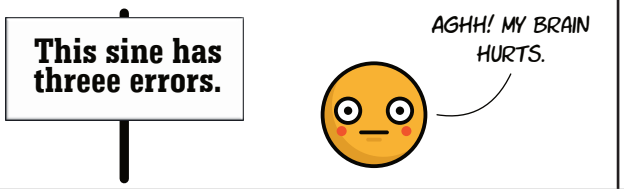
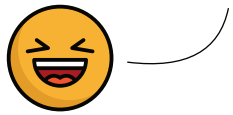
2023

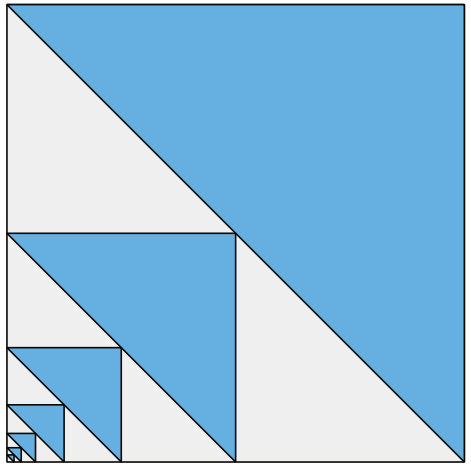
October 2023

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

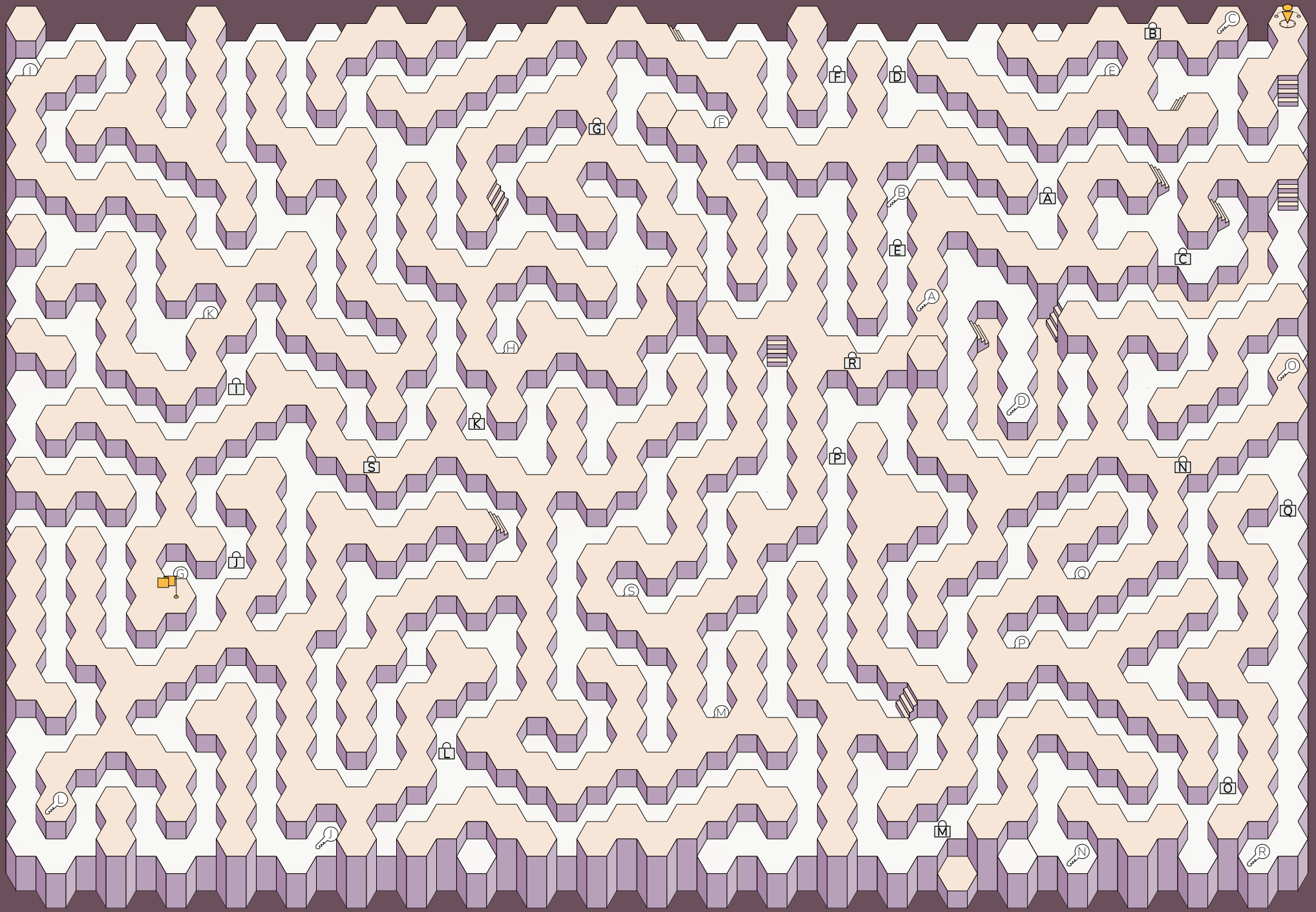
December 2023

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5 Daylight Savings Time Ends	6	7 ElectionDay	8	9	10	11 Veterans Day
12	13	14	15	16	17	18
19	20	21	22	23 Thanksgiving Day	24	25
26	27	28	29	30				



Reach the flag ! Start at and work your way through the maze by finding the keys to get past the locks. Good luck!



DECEMBER

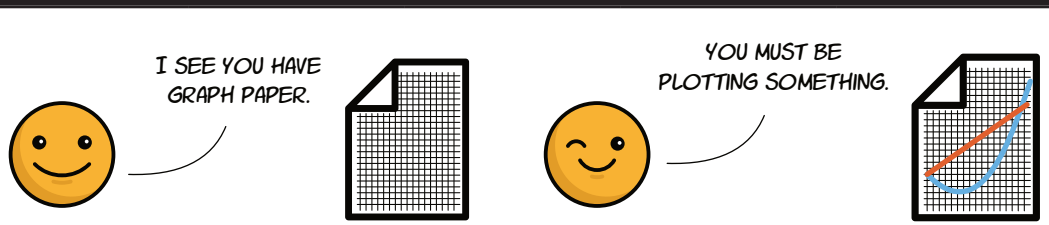
2023

November 2023

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

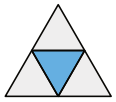
January 2024

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

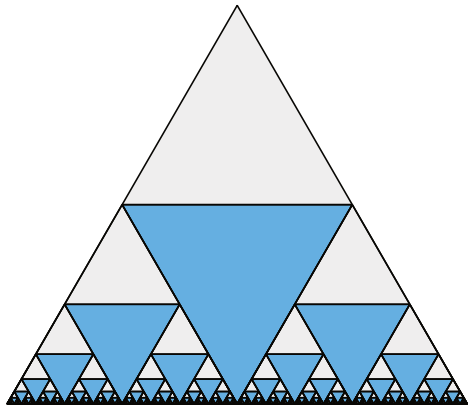
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7 National Letter Writing Day	8	9
10	11	12	13	14	15	16
17	18	19	20	21 Winter Solstice	22	23
24	25 Christmas Day	26	27	28	29	30
31 New Year's Eve						

Blue Down Triangles

A triangle is divided into fourths, and the center triangle is shaded.



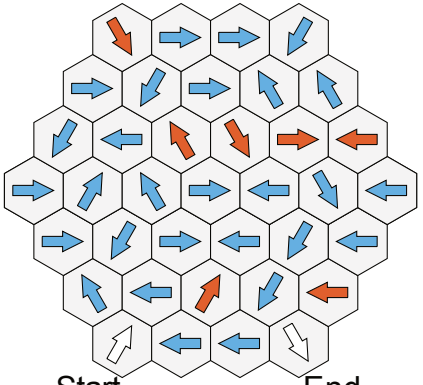
Then the process is repeated over and over with each of the downward pointing sub-triangles touching the bottom line as pictured below. What portion of the original triangle is shaded?



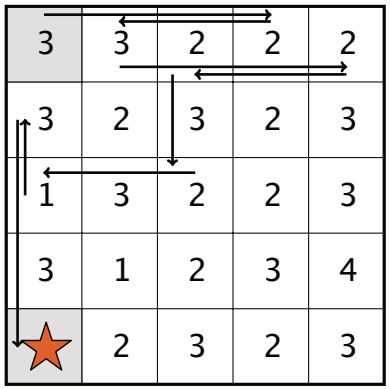
January Puzzle Solution

Team Red will win. To see why, note that either player could win if they play in the center immediately. Thus, we just need to know whose turn it is. Team Red has placed six lines, while Team Blue has placed seven. Thus, Team Blue went first and played most recently, so it is Team Red's turn. Team Red can play in the center and then force a win no matter how Team Blue responds. There are many variations to check, but Team Red can always force a win.

February Puzzle Solution

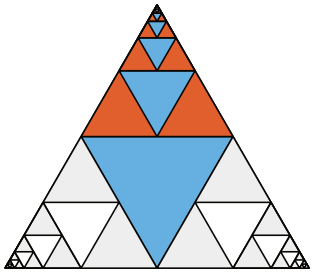


March Puzzle Solution



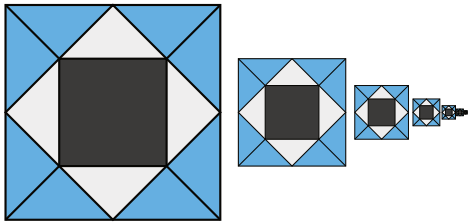
April Puzzle Solution

Exactly ½ is shaded. To see this, we could slide the blue triangles from the bottom half to the top so half is shaded. Below, the triangles that moved are shaded red.

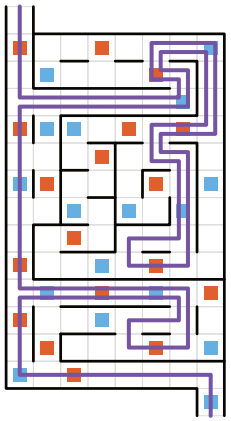


May Puzzle Solution

The whole square is made up of concentric square rings. Each of those rings is shaded 2/3 blue, so 2/3 of the whole square is shaded.

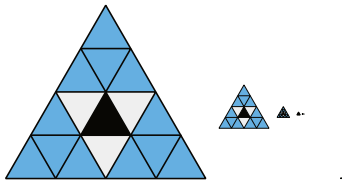


June Puzzle Solution

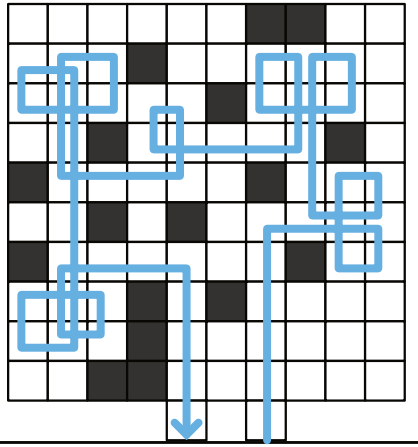


July Puzzle Solution

Exactly 1/5 of the original triangle is shaded. To see this note that we get repeated copies of the triangular band around the outside. In each band we get 3 out of 15 triangles shaded. Thus overall, one fifth of the original triangles is shaded.

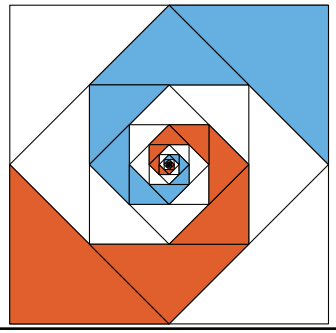


August Puzzle Solution

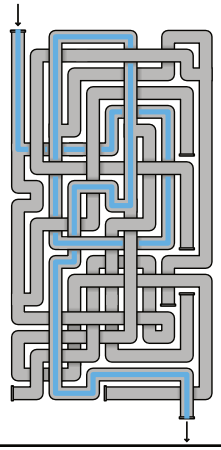


September Puzzle Solution

Exactly ¼ is shaded blue. We can break up the figure into 4 identical tentacle shapes.

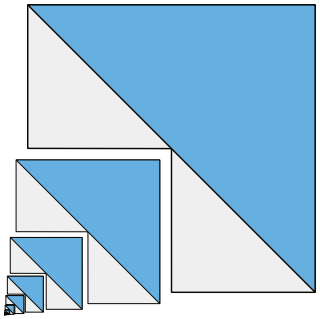


October Puzzle Solution



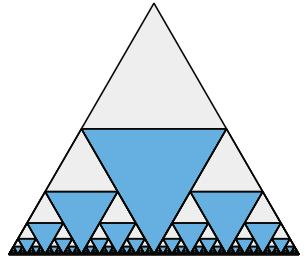
November Puzzle Solution

The big shape consists of L shapes, and each one is 2/3 shaded, so the full figure is 2/3 blue.

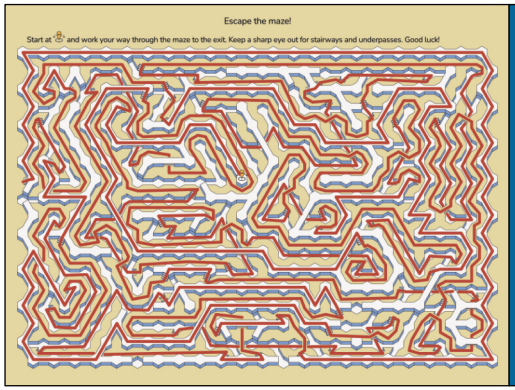


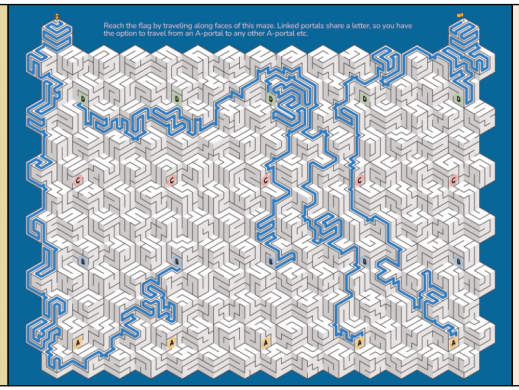
December Puzzle Solution

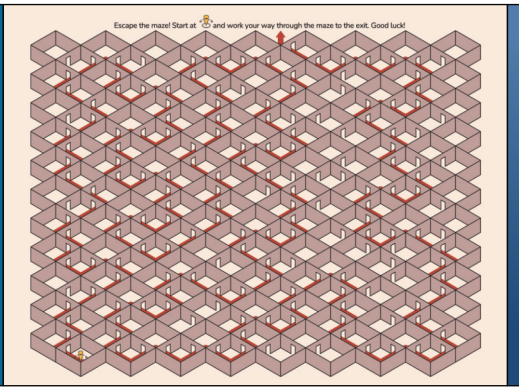
Exactly ½ of the big triangle is shaded. Notice that the entire triangle can be viewed as half-shaded diamonds, so exactly half is blue.

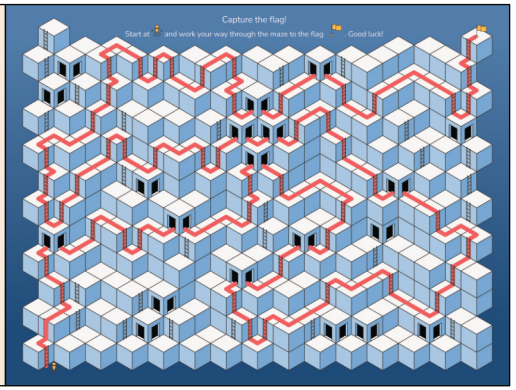


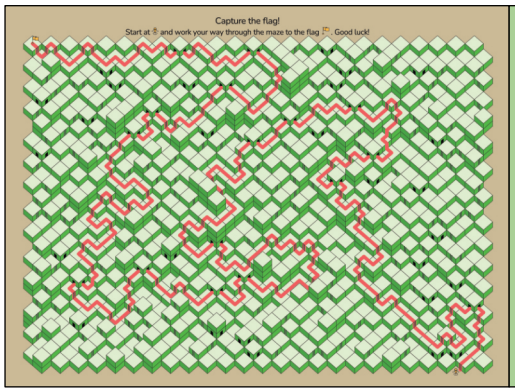
Solutions

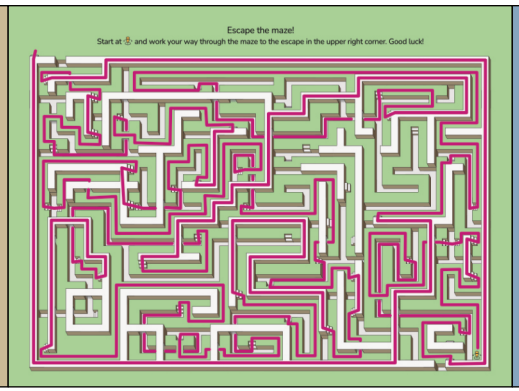


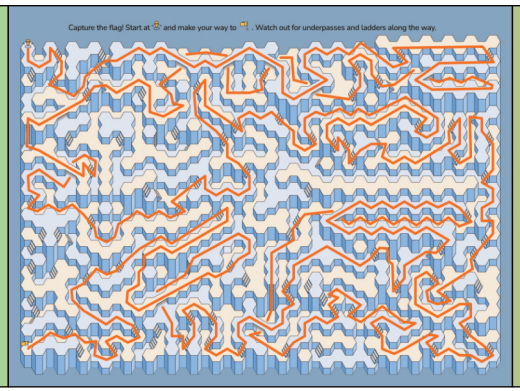


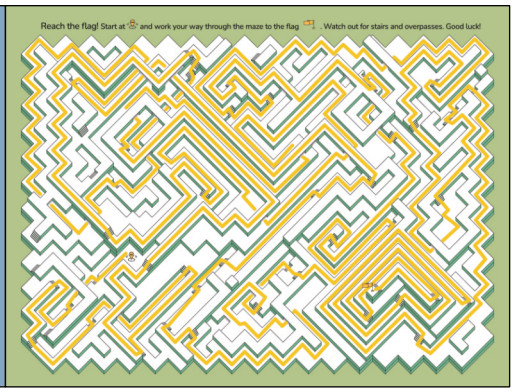


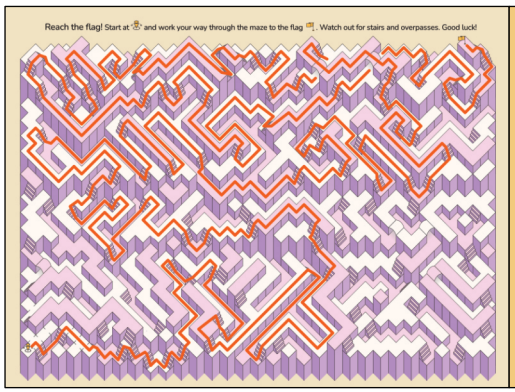


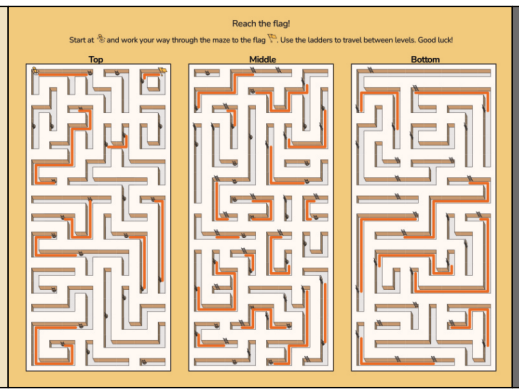


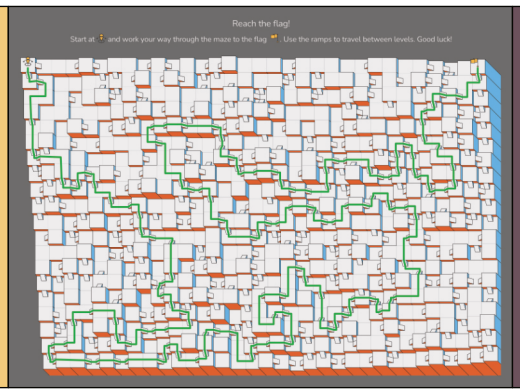


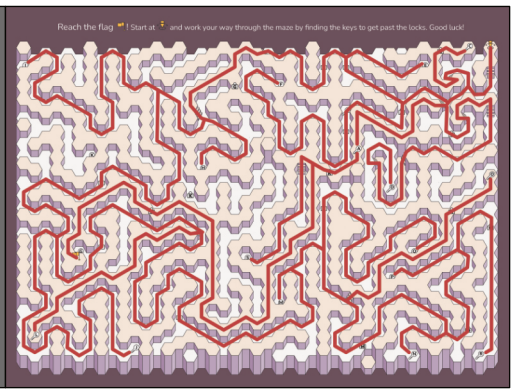




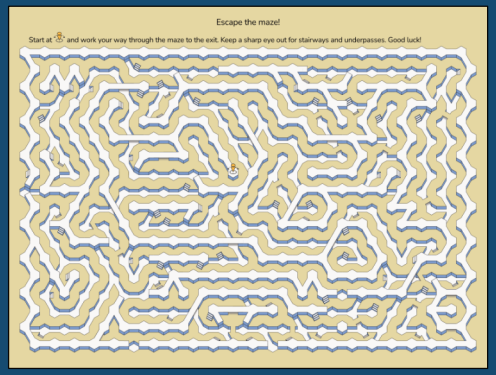


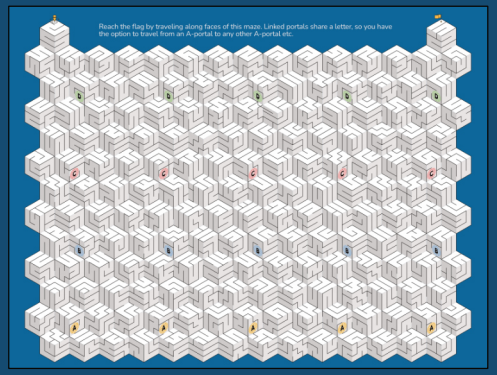


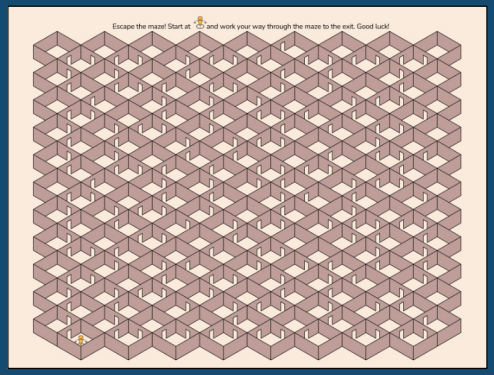


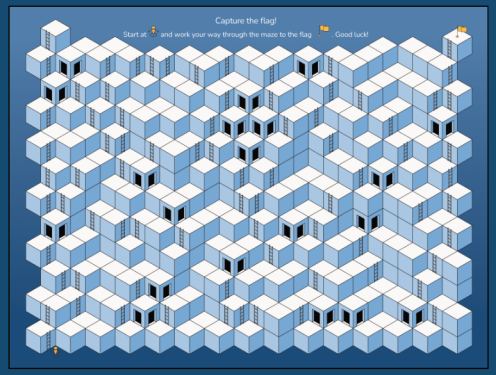


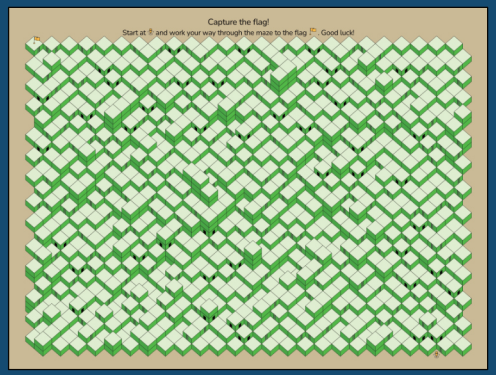
These mazes were created by Serge Ballif (Math Dad). Special thanks to Jenny Ballif (Science Mom), Andrew Ballif, and all of the Science Mom patrons.

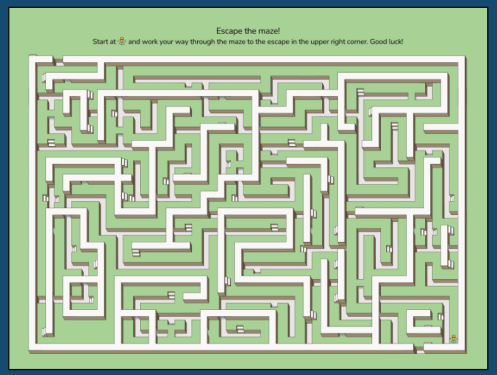


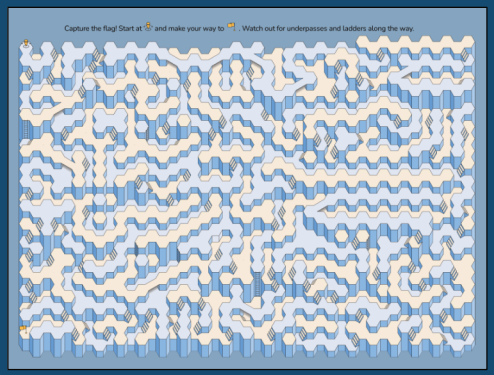


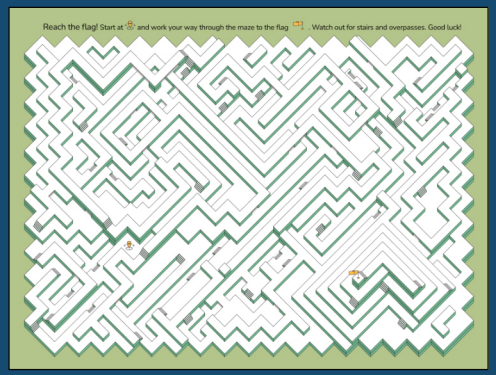


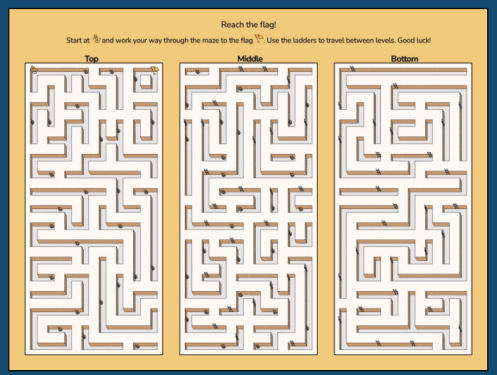


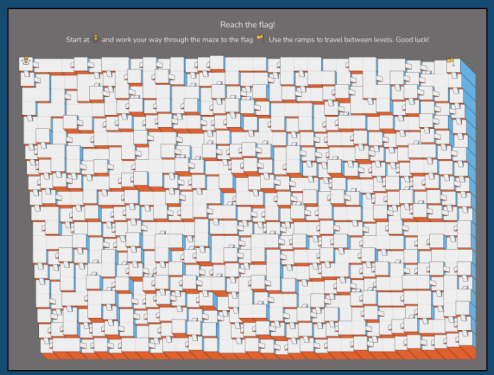












SCIENCE MOM

WWW.SCIENCE.MOM