Let's put your new understanding of the brain to work! In the puzzle below, you'll play the role of the brain, coordinating the movement of a dancer. You'll use input in the form of Choreography Cards to learn the steps to a dance and then carefully Clipbot's direct movement on a Dance Floor Grid using the input.

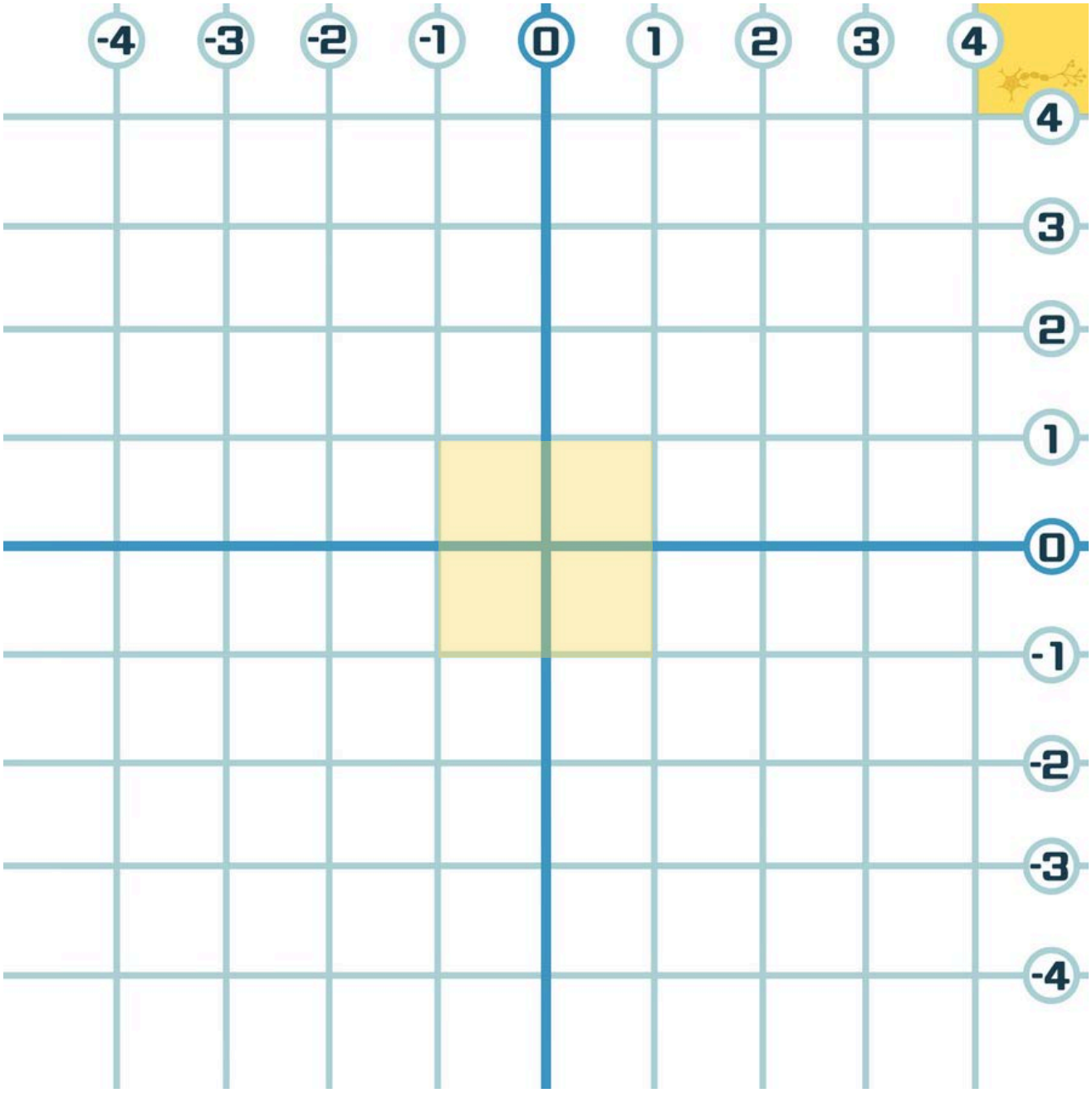
Print out your Dance Floor Grid on which ClipBot will move. It is set up as a coordinate plane with an x and y axis. You'll also need a small action figure like a LEGO mini-fig. If you don't have one, create your own by building a ClipBot using paperclips and other craft items. Finally you'll need the six choreography cards.

First, you will need to figure out the order of the steps to this dance. Each card shows a dance move. The order of the cards creates the choreography. When you place them in the correct order, your figure will start and end its dance in the center of the grid, on the yellow box. Note that when your dancer starts, it is facing forward toward the top of the grid. The way the figure is facing does matter for the puzzle.

Make sure each card is oriented so that the small yellow square is in the upper right corner, just like the grid. Also, pay attention to the orange "X" on each card, which represents the center of your dancer. That spot marks the coordinates, (x, y) on the grid associated with each card. As you move through the choreography, the coordinates associated with each card will reveal the secret code. (Too tough? Try the cards that have the numbers for the coordinates on them or use our dance diagram to see the choreography marked on the grid.)

Once you have the code, enter it into the Science Friday Enigma Machine to find out if you're right and get your digital badge. Use just the 12 digits; skip the parentheses, commas, minus signs, or spaces.

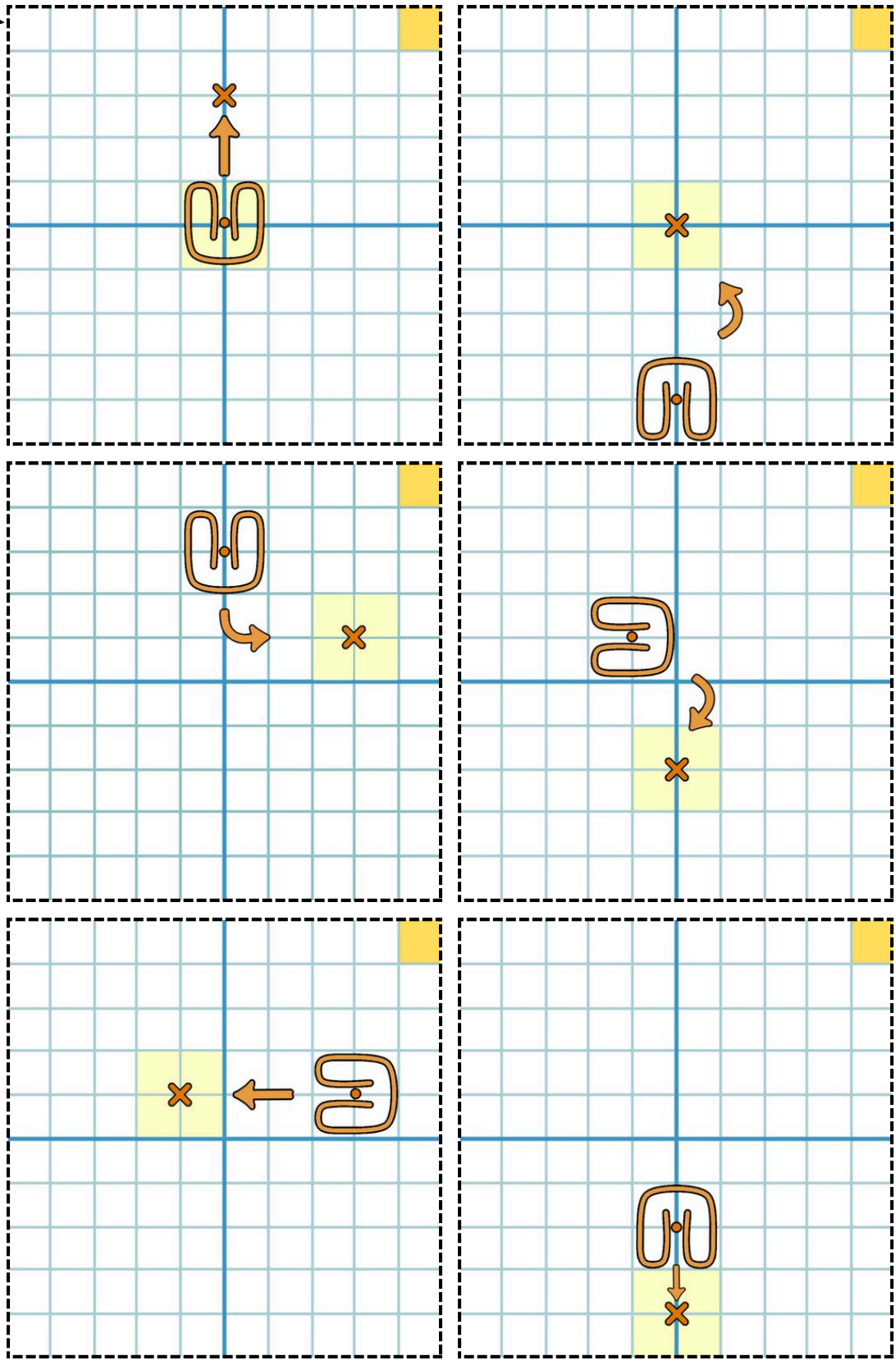
Print out a copy of this Dance Floor Grid. You will need to figure out the order of the steps to a dance using the attached Choreography Cards. Then, you need to move your dancer through that pattern on the grid below. You must start and end in the yellow square in the center. The coordinates from the grid will reveal the code.



Submit code at https://bit.ly/HYBpuzzle1

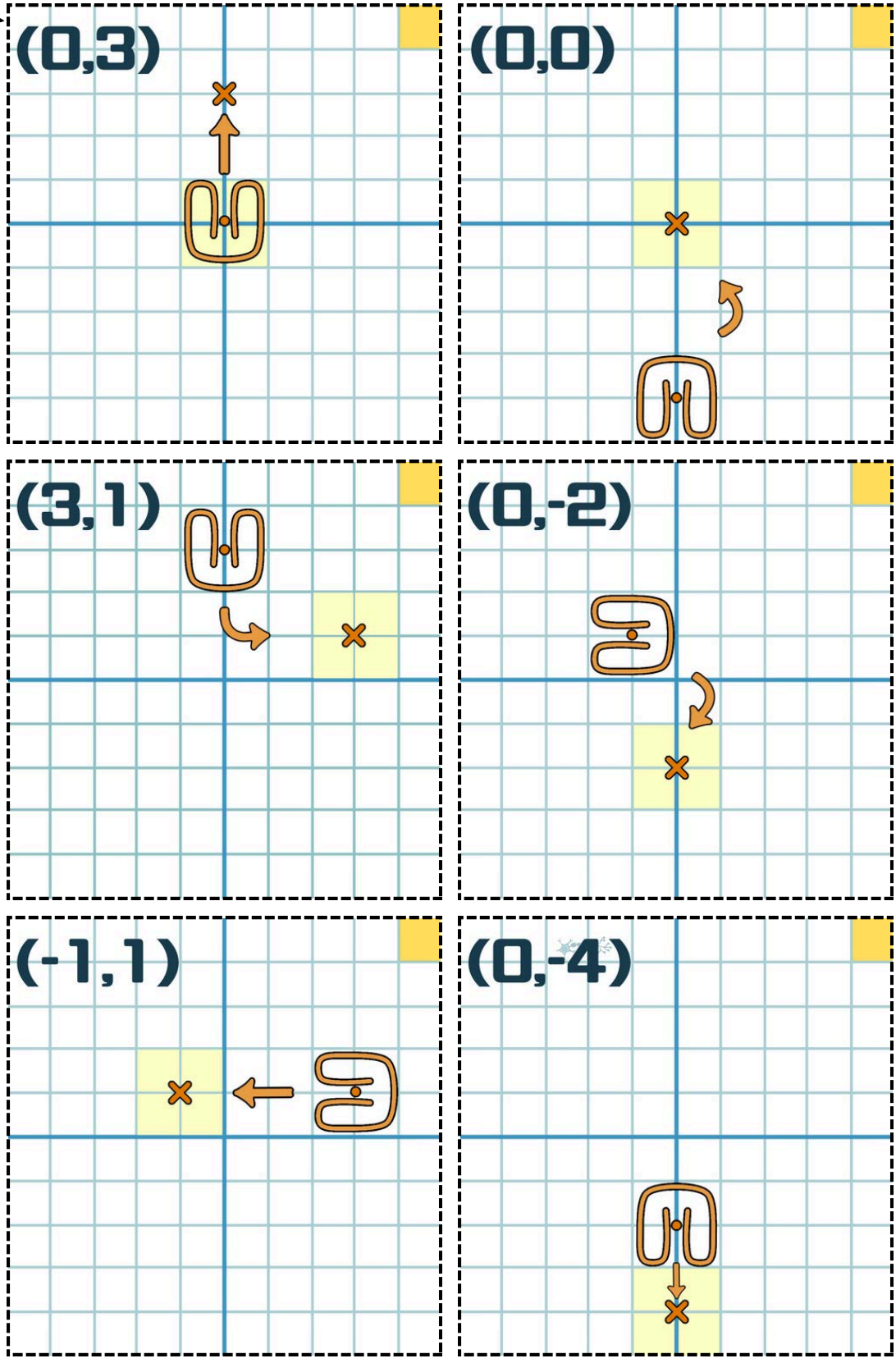
For older learners.

Print and cut out all six Choreography Cards.

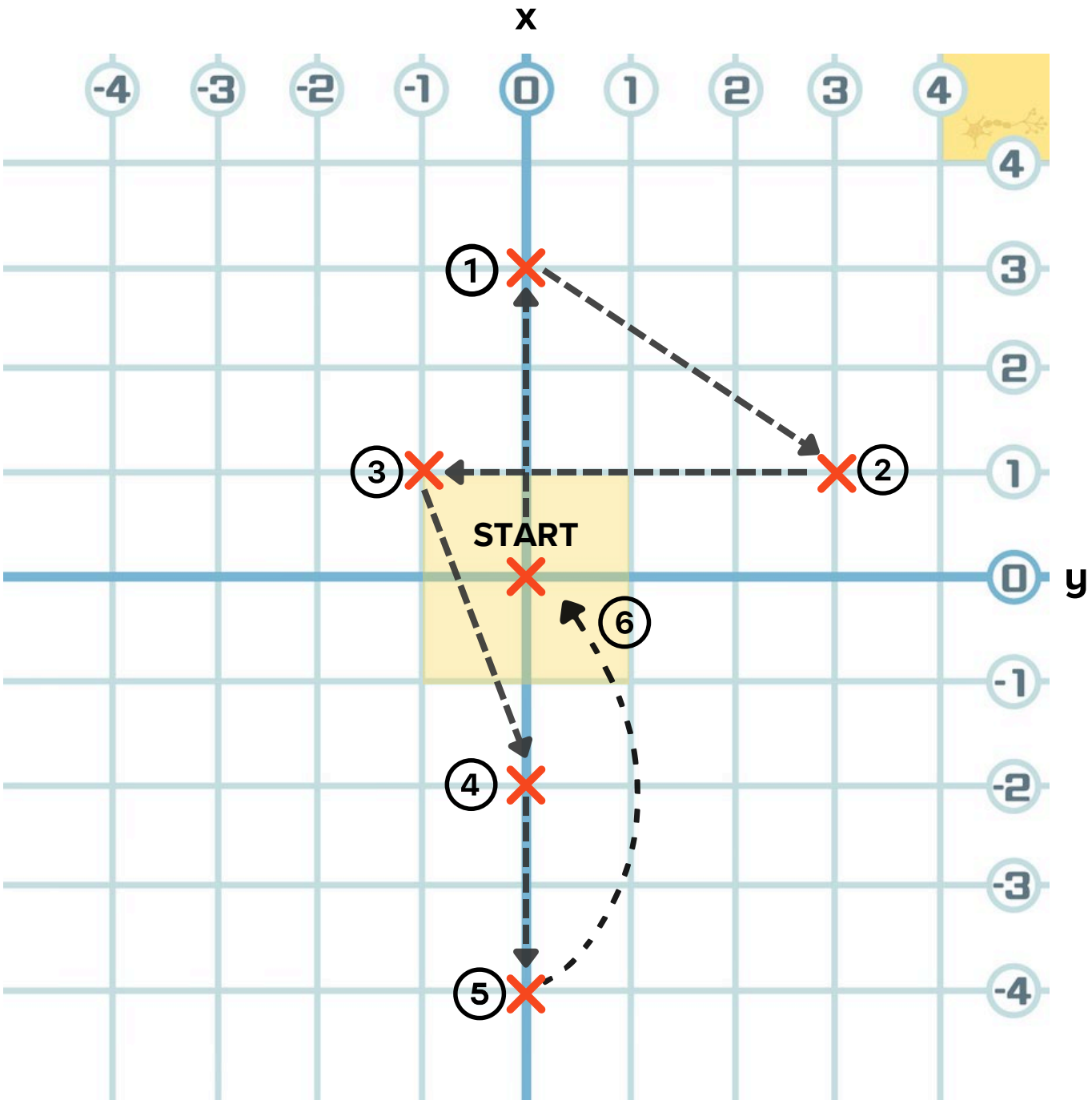


For younger learners.

Print and cut out all six Choreography Cards.



The dance diagram below shows the movement of your dancer across the grid. The orange X's represent the places where you need to record the coordinates, (x,y). So for example, once you place the cards in order, the first move is from (0,0) to (0,3).



Submit code at https://bit.ly/HYBpuzzle1

You can't completely avoid stress, but you can learn to cope with it by flipping the script and thinking of a positive way to channel how you're feeling. In this puzzle, you'll need to pair a stressor with a potential coping skill. But it's not so easy as just matching. Sometimes when you're stressed, it's hard to think straight. We've hidden and distorted the words in this puzzle to make them harder to read, simulating how it can feel when you're under stress. Don't worry though! You'll have the tools you need to cope.

There are three versions of the puzzle, each with a different level of difficulty. In all versions, there are five stressor cards labeled with letters and five coping skill cards with numbers. Start by printing the puzzle of your choice and cutting out the cards along the dotted lines. Mix the cards up.

Next, read the cards. The most challenging version of the puzzle uses a red film decoder. (You can make your own using clear plastic, like plastic wrap, colored with a red permanent marker.) Hold your decoder over the cards to read the text. The second version uses a mirror. Hold the cards up to a mirror to read the text. The final version does not need a decoder or mirror.

Whichever version you choose, start by placing your stressors in alphabetical order. Then match a coping skill to each stressor. The numbers will reveal the secret code. Enter the code into the Science Friday Enigma Machine to find out if you're right and get your digital badge.

Version 1: Decoder Needed

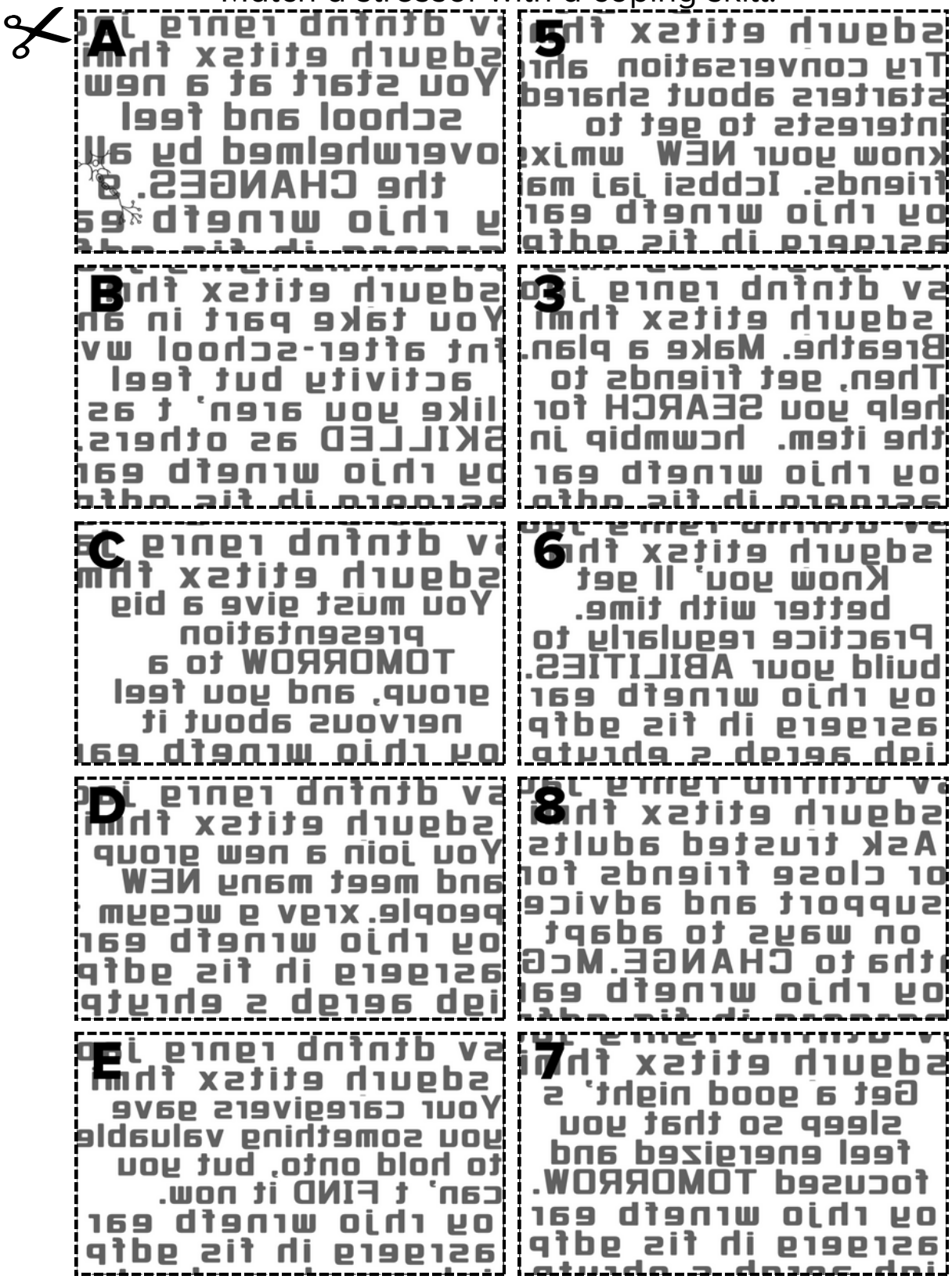
Cut out the cards on the dotted line. Mix them up.

Match a stressor with a coping skill.

Version 2: Mirror Needed

Cut out the cards on the dotted line. Mix them up.

Match a stressor with a coping skill.



Version 3: No Special Equipment Needed

Cut out the cards on the dotted line. Mix them up.
Match a stressor with a coping skill.

A: You start at a new school and feel overwhelmed by all the CHANGES.	3: Breathe. Make a plan. Then, get friends to help you SEARCH for the item.
B: You take part in an after-school activity but feel like you aren't as SKILLED as others.	5: Try conversation starters about shared interests to get to know your NEW friends.
C: You must give a big presentation TOMORROW to a group, and you feel nervous about it.	6: Know you'll get better with time. Practice regularly to build your ABILITIES.
D: You join a new group and meet nine NEW people.	7: Get a good night's sleep so that you feel energized and focused TOMORROW.
E: Your caregivers gave you something valuable to hold onto, but you can't FIND it now.	8: Ask trusted adults or close friends for support and advice on ways to adapt to CHANGE.

Ready to give your brain a challenge? This puzzle demonstrates that memories are formed by creating connections between experiences. You will need to fold the paper and make connections to reveal a completed image of a trophy. There are two versions: A more challenging double-sided version and an easier one-sided version.

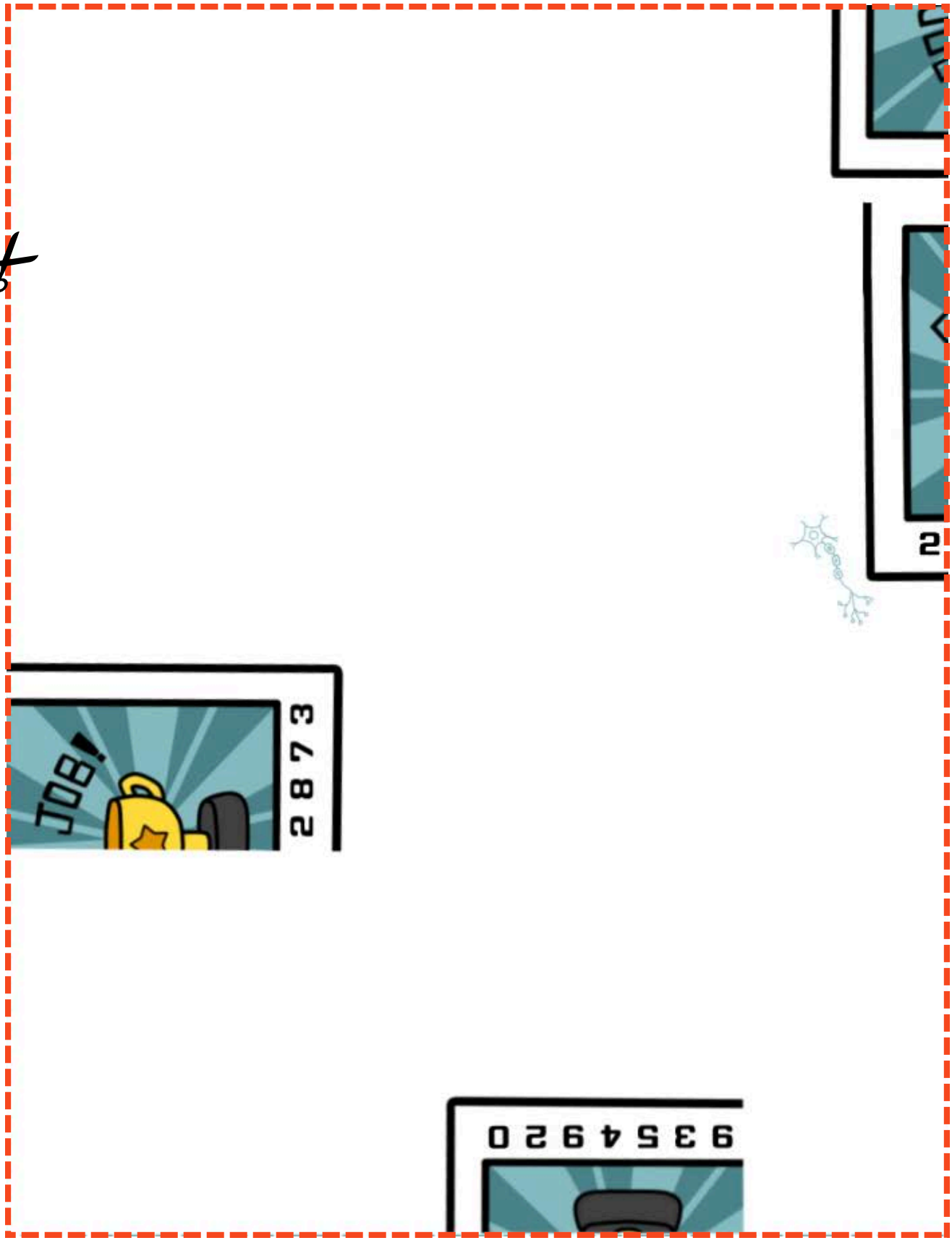
For the first version, download and print the puzzle on paper. You will need to print the puzzle double sided, head-to-head, or print on separate pages and tape or glue the pages back to back. Use scissors to trim on the orange dotted line. Then fold, fold, fold, fold (hint!) until you are able to create the image and reveal the code.

For the second version, print the puzzle and use scissors to trim along the orange dotted line. Then accordion fold the puzzle along the black dotted lines. Look at the results from different angles. The secret code will be revealed!

Once you find the secret code, enter it into the Science Friday Enigma Machine to find out if you're right and get your digital badge.

Print double-sided, head to head. Cut along the dotted line.

Print double-sided, head to head. Cut along the dotted line.



Print. Cut along the orange dotted line. Fold on black dotted line.

In this challenge, you will use your spatial memory to navigate a maze. There are three versions of the maze. For the first version, print out the maze and use a pencil or pen to solve it. Note the numbers you pass on a successful path through the maze and record them in order from Start to End. These numbers are the secret code.

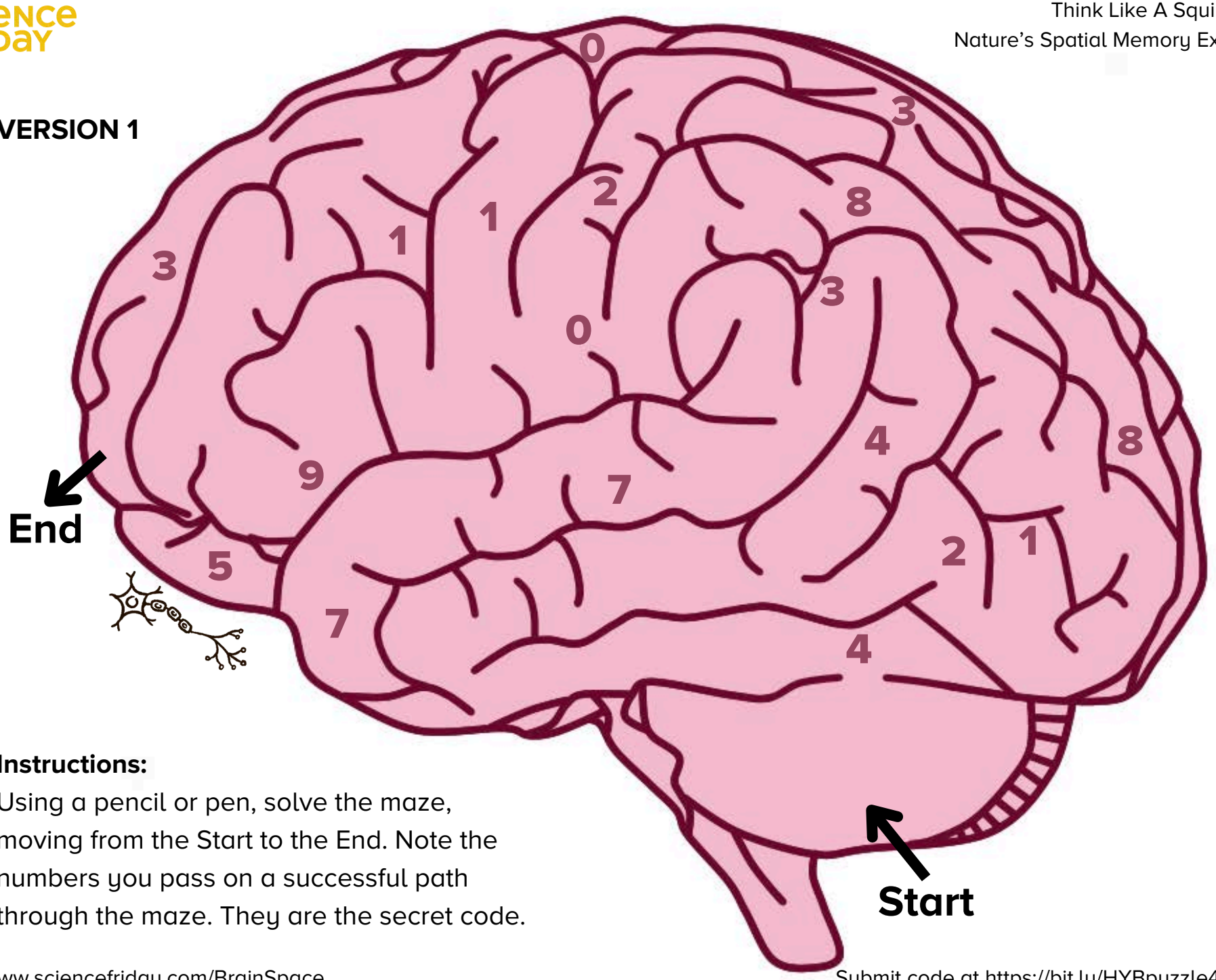
For a collaborative challenge, try the second version, where you and a friend must navigate the maze together. But there's a catch! Each player can only see half of the maze. You'll need to give each other directions and identify obstacles to figure out the right path. Just like in the first version, you'll need to note the numbers you pass in order from Start to End, but in this version, you may not see all the numbers on your side of the maze.

You'll need to do a little bit of construction for version two. (Crafty fun!) Download and print the two sides of the maze. Attach each to the front and back of a piece of thin scrap cardboard, like a piece of a cereal box. Place two magnets opposite one another on either side of the cardboard at the start of the maze.

Before starting the challenge, each person can view a complete copy of the maze for two minutes so that you have the opportunity to create a cognitive map. Next, each person will sit on their side of the maze and is not allowed to look at the other side during the challenge. Together, you and your friend must move the connected magnets through the maze, directing one another as needed to avoid obstacles.

There is also a third version that places a grid over the maze to make it easier for learners to direct movement. In this version, both players start at "E2" and take turns telling the other player where to move using the numbers and letters along the sides of the grid. It's a bit like the game Battleship, but with brains.

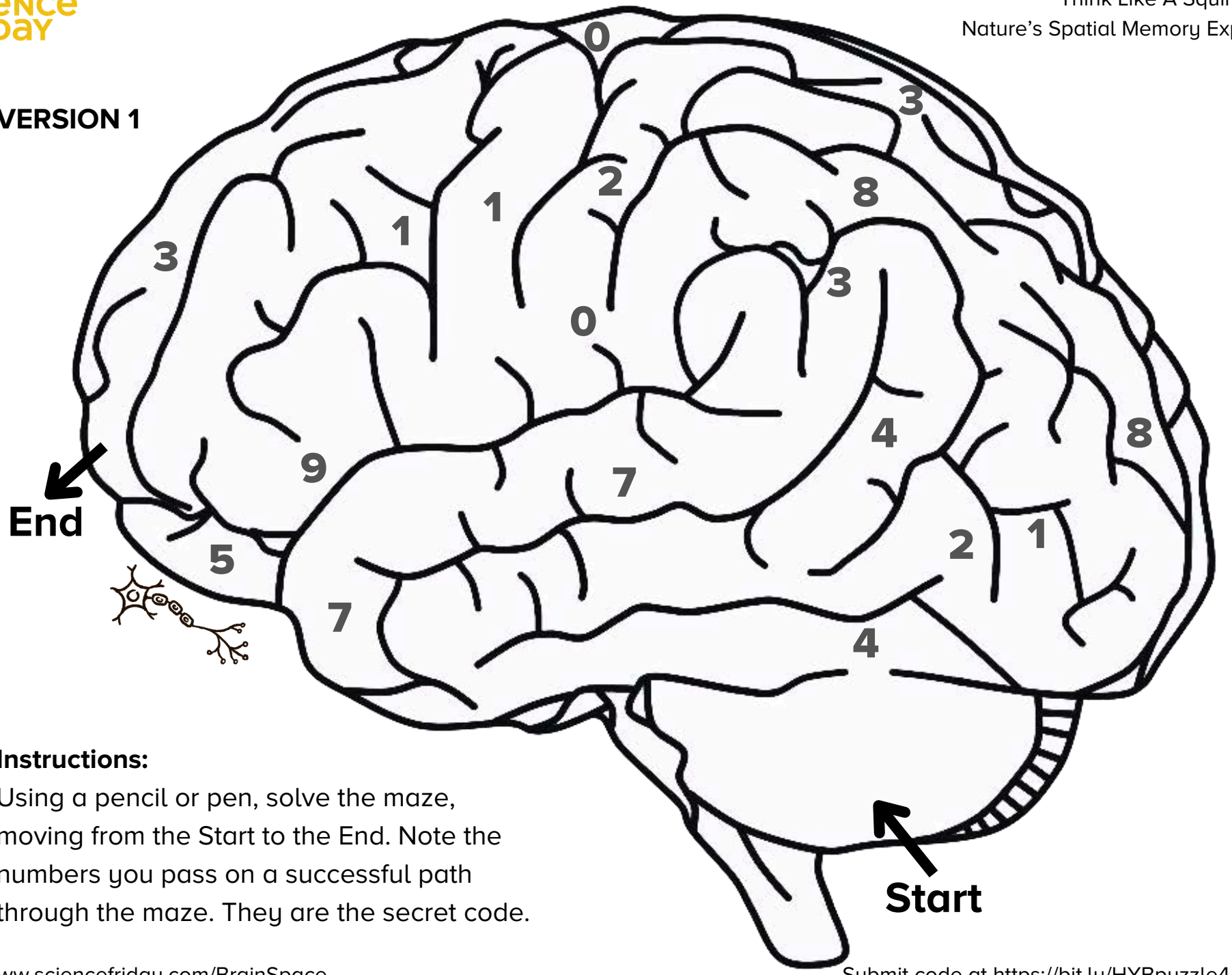
VERSION 1



Instructions:

Using a pencil or pen, solve the maze, moving from the Start to the End. Note the numbers you pass on a successful path through the maze. They are the secret code.

VERSION 1



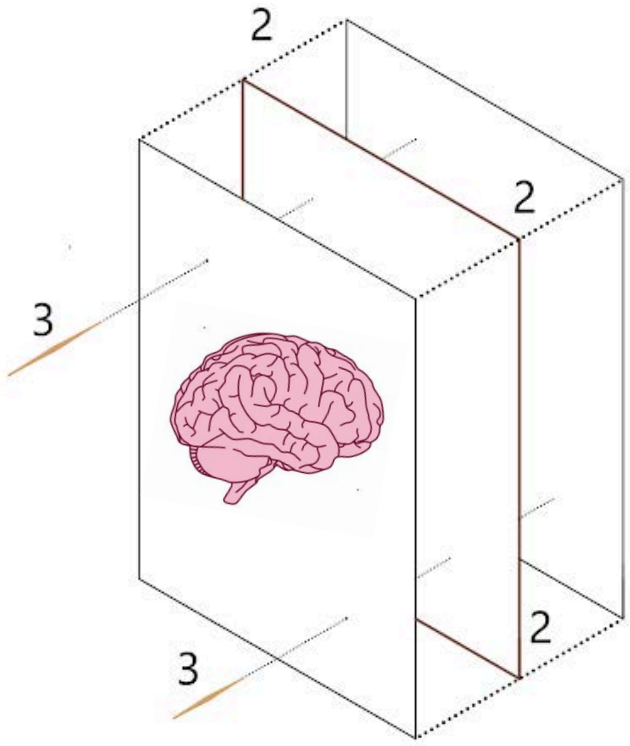
Instructions:

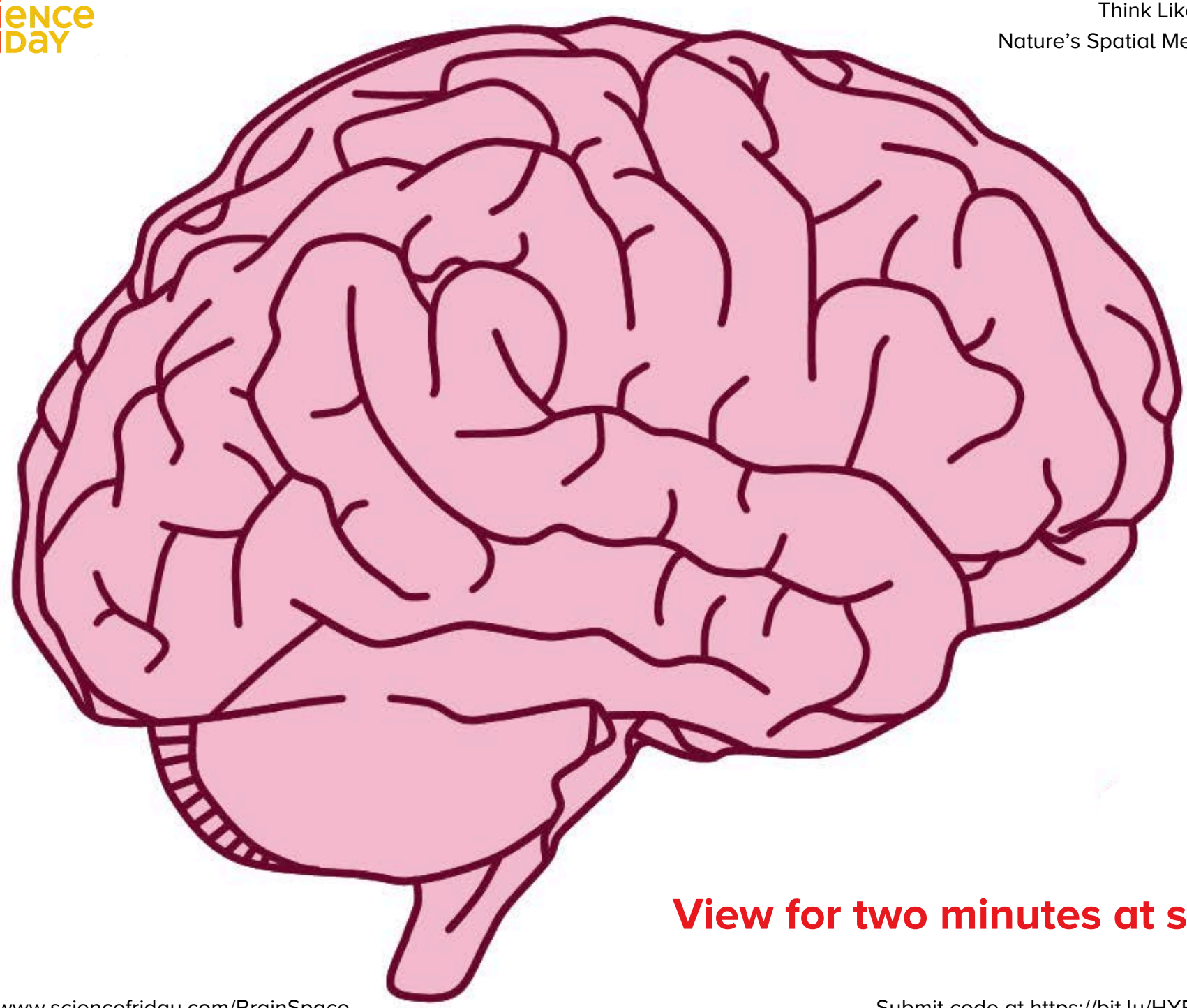
Using a pencil or pen, solve the maze, moving from the Start to the End. Note the numbers you pass on a successful path through the maze. They are the secret code.

VERSION 2 and 3

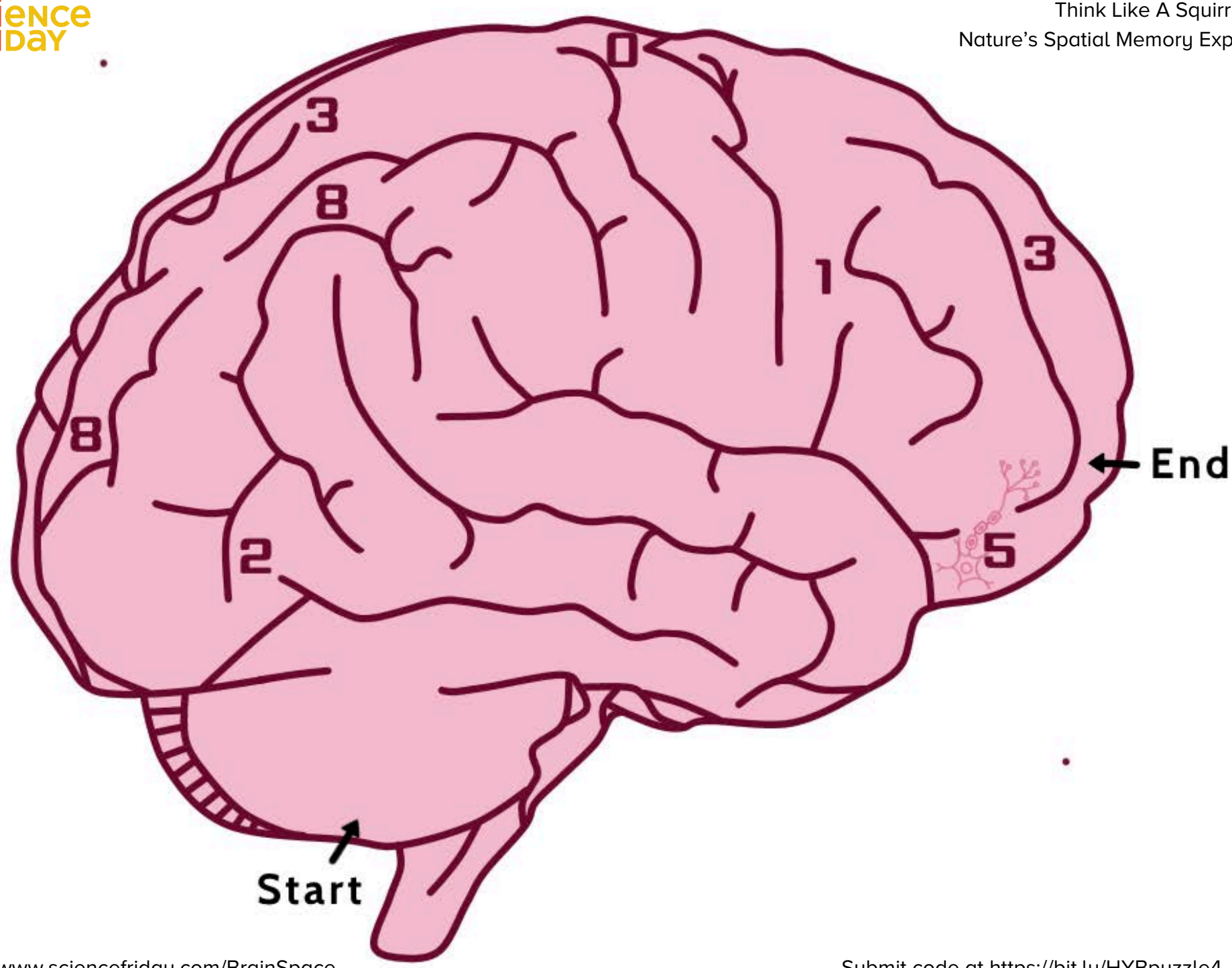
Construction:

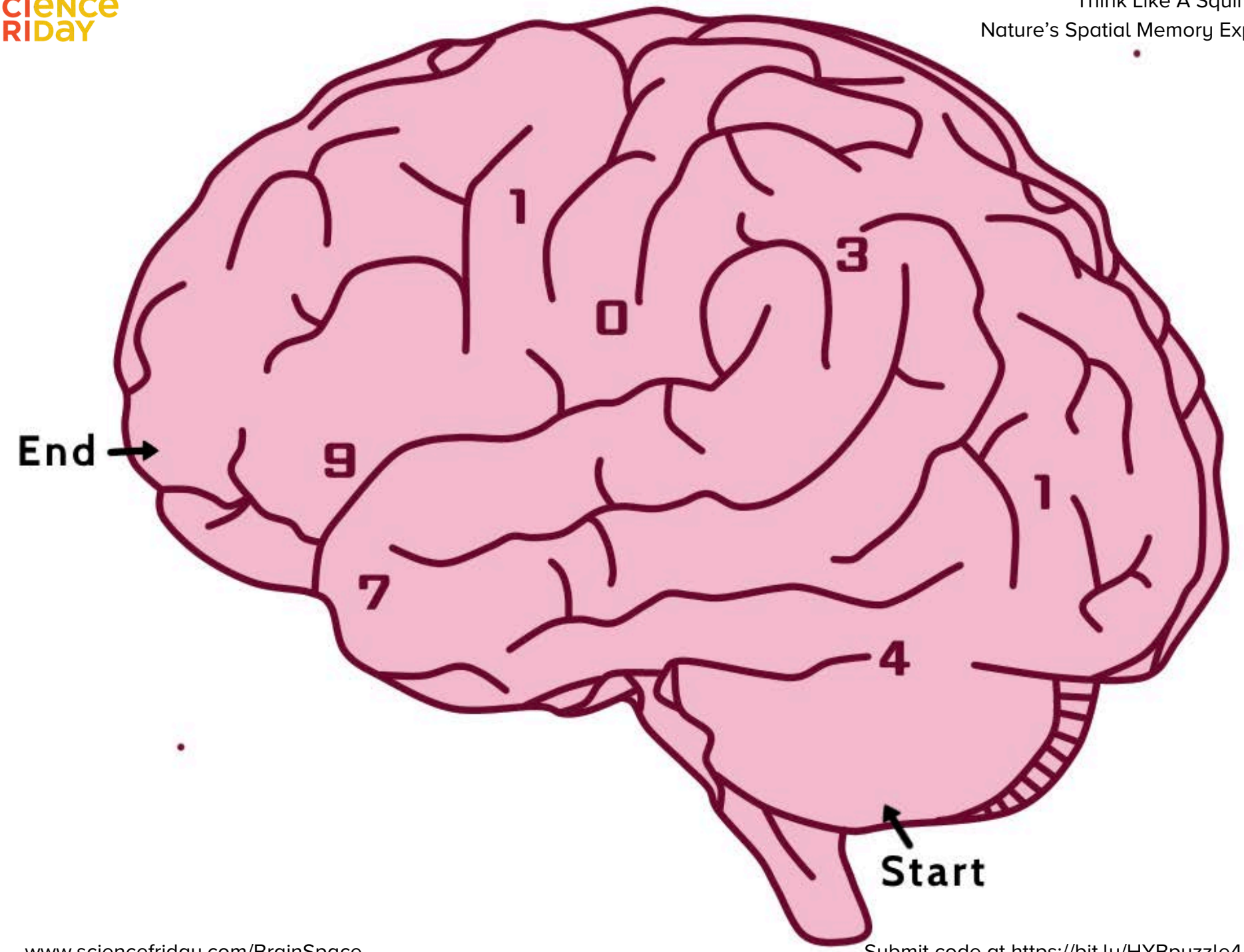
1. Print out both brain images on copy paper.
2. Place the the images on a sturdy surface like thin cardboard so that each side has one image. A cereal or cracker box works well. Use glue or tape to attach the mazes.
3. If needed, use pins, a toothpick or a paperclip to poke through the dots from one side to the other to align the images. If using precut cardboard this may not be necessary.
4. Optionally, create feet with small binder clips to that the maze can stand on its own.
5. Place two magnets opposite one another on either side of the cardboard at the "Start" of the maze. They should attract to each other through the cardboard. If they repel, try placing a paperclip under the magnet on one side. The magnets must stay connected throughout the challenge.
6. To help learners give directions to one another, use the gridded version of the maze.



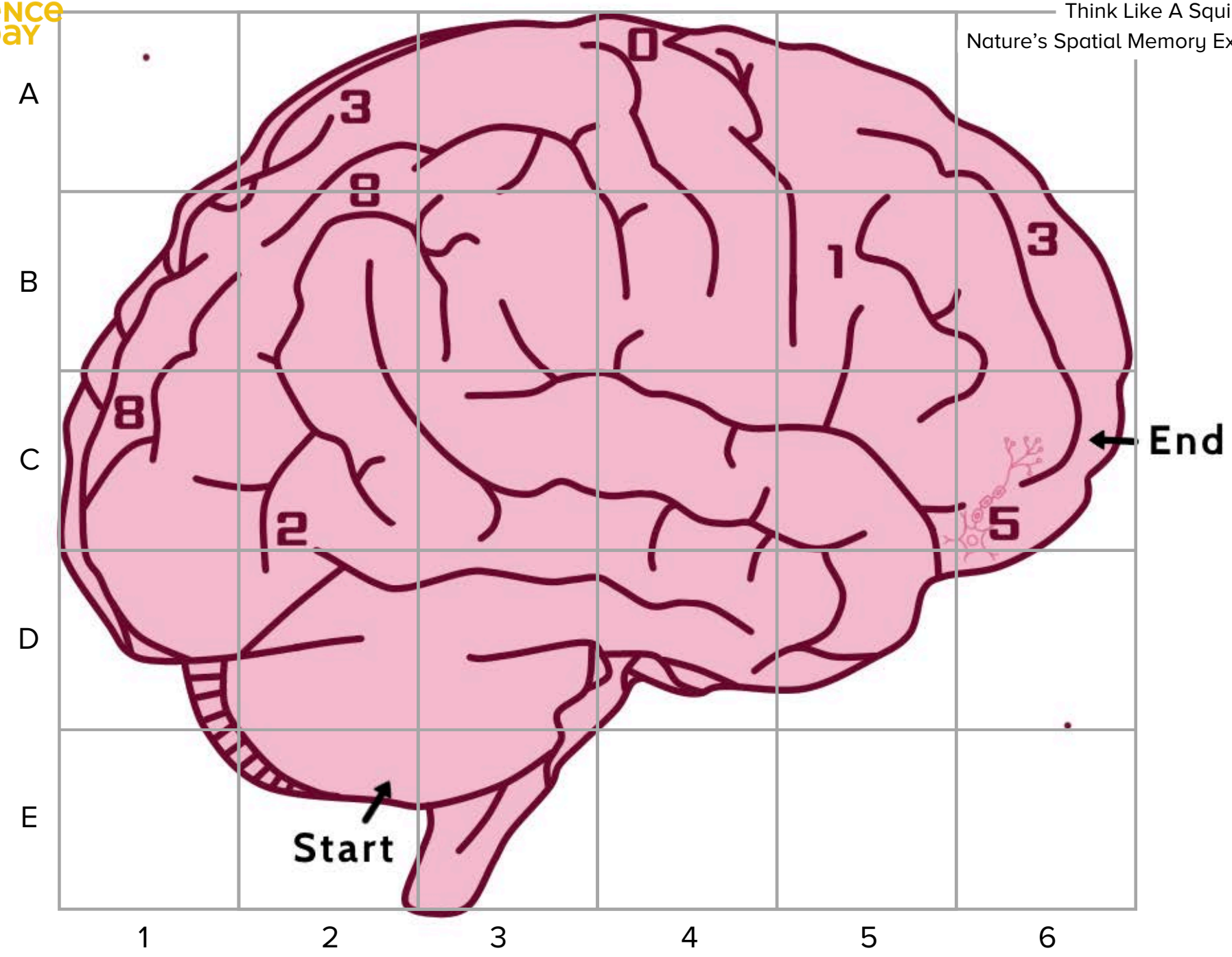


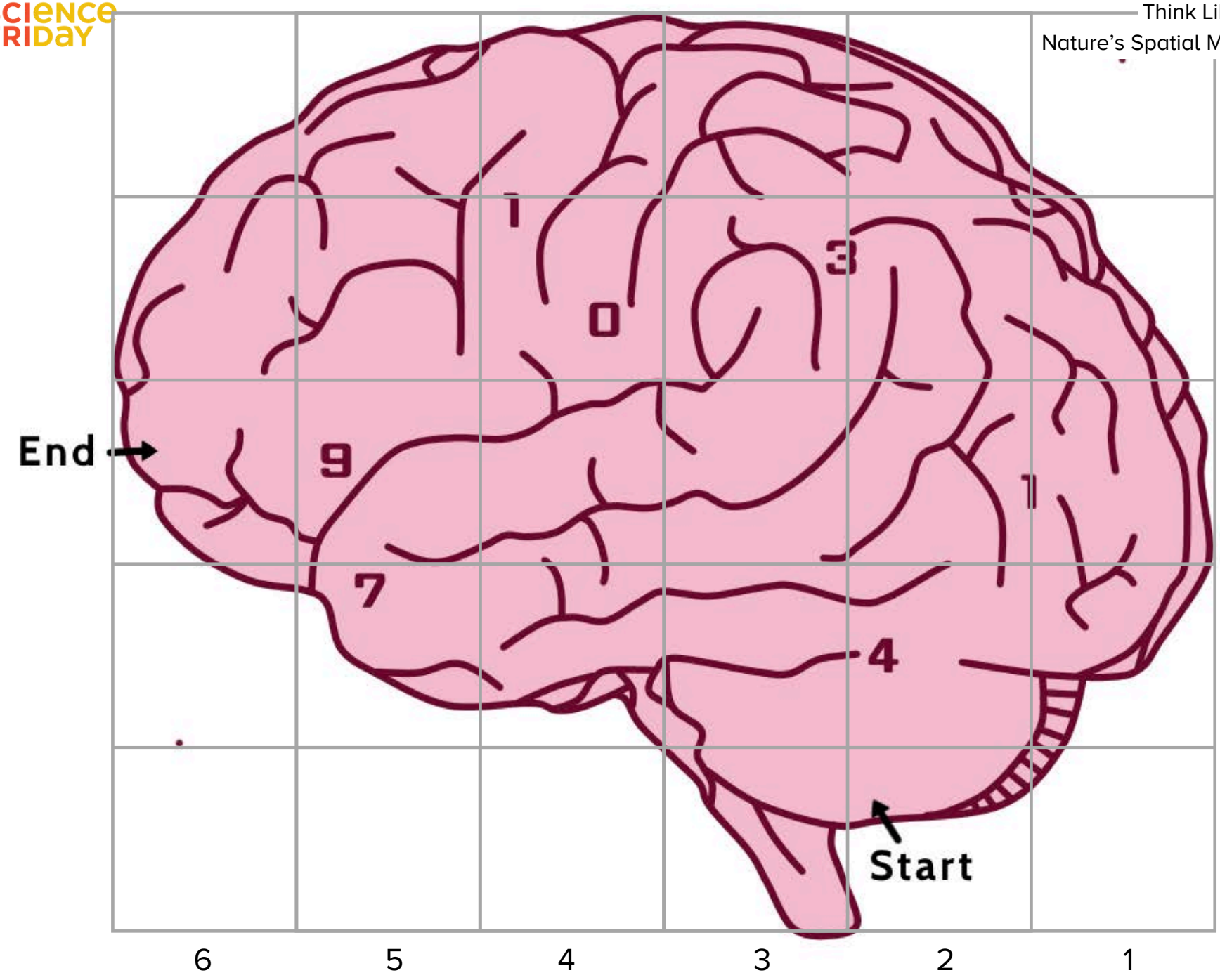
View for two minutes at start.


0
3
8
1
3
8
2
5
End
Start

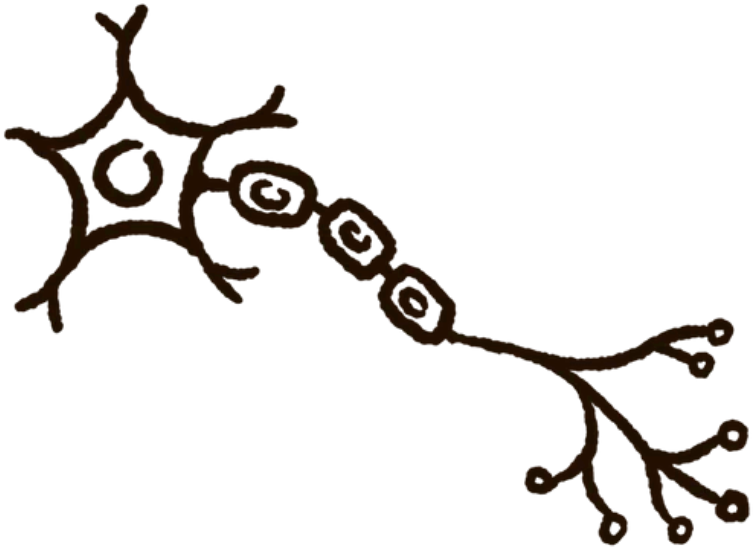


Submit code at https://bit.ly/HYBpuzzle4


A
B
C
D
E
1
2
3
4
5
6
0
3
8
1
3
8
2
5
End
Start

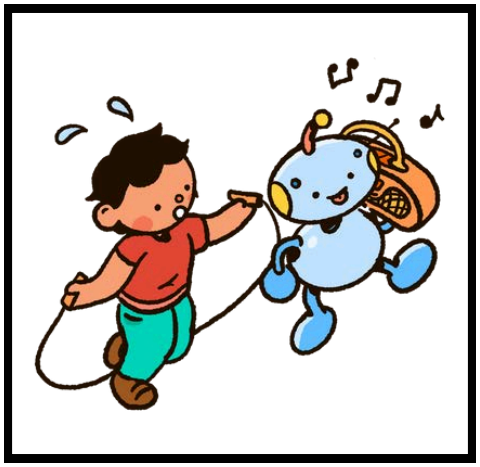


Submit code at https://bit.ly/HYBpuzzle4

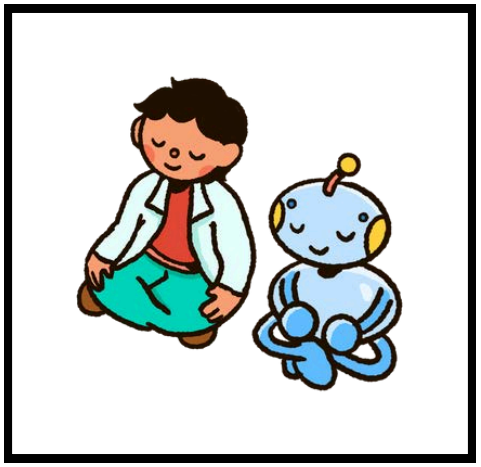


Find this neuron symbol in the previous Hack Your Brain puzzles. Look for a number located near each neuron. The pictures below are from each Hack Your Brain activity and correspond to a puzzle. Place the numbers you find in each puzzle with the matching image to discover the final secret code.

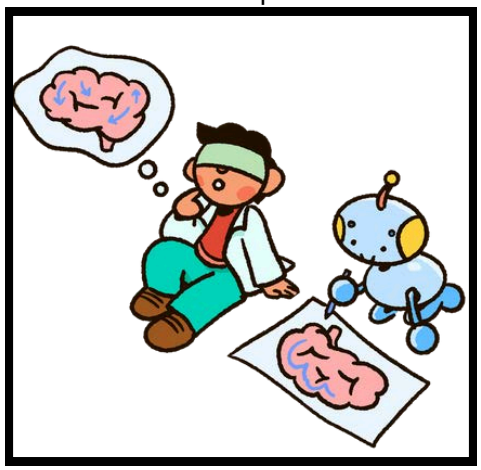
BrainMoves



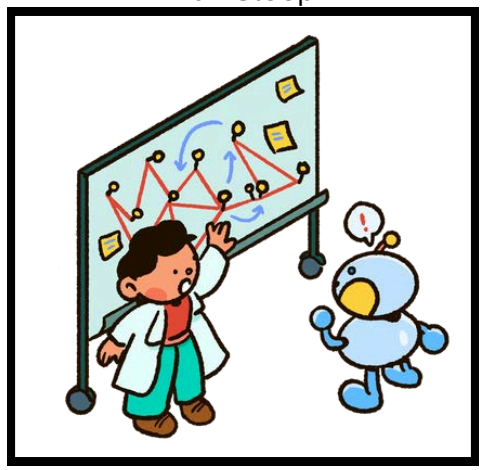
BrainStress



BrainSpace



BrainSleep

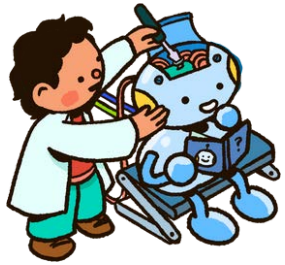


_____ _____ _____ _____

Submit code at https://bit.ly/HYBpuzzle5

Hints & Solutions!

On this page are hints to help you with the most challenging versions of the puzzles as well as the secret codes for each one. Need more help? We've created an Instructor's Guide with additional information at https://bit.ly/HYBguide.



More information at
ScienceFriday.com/HackYourBrain

Activity 1 - Discover How Your Brain Builds Muscle Memory (BrainMoves)

- First, you must put the six cards in the right order. There is only one sequence that will start the robot's "feet" at the center of the grid and return to that exact spot.
- Second, pay attention to the "X" on each card. The spot marks the coordinates on the grid for the location of each X.
- Record the coordinates for each X in order. That's your code! Only include the twelve numbers, nothing else.

Secret code: 033111020400
https://bit.ly/HYBpuzzle1

Activity 2: Train Your Brain To Manage Stress (BrainStress)

- The cards with black letters in the upper left corner are stressors. Use your red film or mirror to decode them. Note the words in all capital letters.
- The cards with numbers in the upper left corner are ways to cope with the stressors. Use your red film or mirror to decode them. Again, note the words in all capital letters.
- Place the stressors in order from A-E. Then, match each stressor with a coping skill. The numbers form the code.

Secret code: 86753
https://bit.ly/HYBpuzzle2

Activity 3: Boost Memory And Learning With The Science Of Sleep (BrainSleep)

- To create an image of the trophy, you will need to fold the paper in various directions. As you fold, some parts of the images and numbers will be covered. That's okay! The code only uses the numbers that you can see completely after folding. Use the solid lines of the image to guide you. You should make at least four folds.
- There are seven numbers in the code.
- Note that due to printing differences, things may not line up perfectly.

Secret code: 2352873
https://bit.ly/HYBpuzzle3

Activity 4: Think Like A Squirrel: Nature's Spatial Memory Expert (BrainSpace)

- It's important to communicate frequently when working through the maze. Before beginning, establish what words like "up," "down," "right," and "left" mean to each participant. Partners may want to take turns speaking.
- It's ok to use the brain maze map to guide you.
- It may be easier to complete the maze first and then go back to determine what numbers you passed. You need six numbers for the code.

Secret code: 428093
https://bit.ly/HYBpuzzle4

Puzzle 5: Hack Your Brain To Increase Focus And Attention (BrainFocus)

- You are looking for the nerve cell, or neuron. You can find it hidden in previous Hack Your Brain puzzles. Each time it occurs, it is near a number. Those numbers make up the secret code.
- The pictures at the bottom of the puzzle page show the order of the numbers. Each is associated with a Hack Your Brain resource.

Secret code: 4925
https://bit.ly/HYBpuzzle5