



MATHEMAGIC

- MAZE -



Educational Goals

- ❖ Develop logic
- ❖ Observe the characteristics of parity applied to a checkerboard

Key Features of the Targeted Competencies

- ❖ To decode the elements of the situational problem
- ❖ To modelize the situational problem
- ❖ To apply different strategies in order to elaborate the solution
- ❖ To validate the solution
- ❖ To define the elements of the mathematical situation
- ❖ To apply mathematical processes appropriate to the given situation

Concepts Used

- ❖ Parity
- ❖ Characteristics of a checkerboard

Materials

- ❖ Video of the trick
- ❖ Whiteboard or sheet of paper
- ❖ Pencil
- ❖ Magnet

Targeted Academic Levels
Grades 3 to 6

Mathematical Field Concerned



Suggested Teaching Formula



Time Required
25 to 30 minutes





SUGGESTED PROCESS



Step 1: Introduction (5 minutes)

Play the video of the magic trick once (www.amazingmaths.ulaval.ca).

You will find in the Explanation Sheet for the puzzle “Maze” the steps to follow if you want to do this magic trick yourself with your students rather than play the video.

Step 2: Recreate the trick in class – the whole class together (5 - 10 minutes)

To do the trick in class, draw a squared maze on the board, like this one:

1	2	3
4	5	★
6	7	8

Explain to the students that the maze can be like a checkerboard. Ask a volunteer to come to the front to act as the spectator in the trick, this time with the maze drawn like a checkerboard. Refer to the Explanation Sheet for the trick “Maze” to recreate the series of movements of the video. Ask the students to try to find how the trick works.

Step 3: Finding the solution – the whole class together (15 minutes)

To begin with, ask the students to formulate their hypotheses on how the trick works and what they think they have noticed.

Depending on the answers given by the students, adapt the questions to ask to deepen their thoughts. For each question, do the action requested to observe what happens.

To guide the thought process, here is a list of questions that you can ask:

- What happens during a movement of one square? (*It changes the square's colour.*)
- What happens during a movement of two squares? (*It preserves the square's colour.*)
- What happens during a movement of three squares, five squares, etc.? (*It changes the square's colour.*)
- What happens during a movement of four squares, six squares, etc.? (*It preserves the square's colour.*)
- What can we notice? (*The movements of an odd number change the square's colour and the movements of an even number preserve the square's colour.*)



SUGGESTED PROCESS



Once the students understood the change of colour based on the number of movements, you can repeat the trick's steps, so they apply this notion to the way the trick works.

To become more familiar with the rest of the explanation, you can watch the solution video which explains every step of the trick.

Step 4: Learning objectives (15 minutes)

To verify the comprehension of the trick, you can ask the following question:

- Could the number of movements have been different? (*Yes, but the magician must anticipate the squares having to be removed accordingly.*)
- Can the squares having to be removed be different? (*Yes, but the series of movements has to be carefully planned by the magician, so he respects the squares' colour. He must also be careful not to divide the maze in two.*)
- Would it be possible to create a new trick by changing the series of movements? (*Yes.*)
- Can the final square be different? (*Yes, simply by adapting the series of movements.*)
- Would it be possible to do this trick with a bigger or a differently shaped maze? (*Yes.*)

To go further!

Suggest to the students to draw their own maze and choose their own series of movements.
Invite the students to show the trick to their parents, their friends or even to another class!