



MAGNETIC MAZES OBJECTIVE

Inspired by [Andrew Neyer's](#) UnMuseum Sign the students will use problem solving and an understanding of mapping skills to design, create and solve small magnetic mazes.

VOCABULARY

Maze
Minotaur
Greek Mythology
Cardinal directions
Compose rose
Working Backwards
Guess and Check
Labyrinth

MATERIALS

Various examples of mazes to share with the students

Shoe box lid

Straws

Markers

Glue

Pencil

Ruler

1/2 - 1" clip-art images such as automobiles, etc.

Small metal paper clip

Clear tape

Child safe magnetic wand

BEFOREHAND

Collect materials

Research grade appropriate version of the Greek Myth, The Tale Of The Minotaur.

DISCUSSION

Choose a version of the Greek mythological tale of the Minotaur that is grade appropriate.

Introduce or review the myth with the students. Discuss the role of the Labyrinth in this tale.

Present examples of different mazes and challenge the students to solve them

Ask the students what strategies they used to solve the maze. Introduce the problem solving strategy Guess and Check. Explain how this is often used to solve mathematical problems. Discuss how using this method would aid in solving this type of puzzle.

Ask the students how they would approach the task of creating a maze. Introduce the problem solving strategy Working Backwards. Discuss how this is often used to solve mathematical problems. Discuss how planning a maze from the termination point back to the beginning is an efficient way to construct the puzzle.

Explain that they will be designing mazes where a magnet controlled paperclip will travel through the created pathways.

PROCEDURE

On the shoebox lid have the students design their mazes. Have the students begin by designing the pathway that will allow users to reach the end. Instruct them to use a pencil and straight edge to create uniformity and allow for errors. The pathways should be approximately 1 inch wide to allow the paperclip enough space to maneuver through the puzzle. Once they have established the primary path have the students add the dead-end routes to their design.

Cut straws to fit the pencil borderlines of the maze. Glue them onto the lines to create raised pathways. These straw boundaries will create resistance for the paperclip as the magnet wand moves it through the space.

Have the students illustrate an image for the object that will travel through the maze such as a car or person. It should be approximately 1 inch in size. Use clear tape to attach the image to the small paperclip.

Place a compass rose on their design- it can be placed on the opening to the maze.

Have the students create written solutions for their mazes incorporating cardinal direction terminology.

Have the students share their mazes with one another- first trying to solve the puzzle using the guess and check method and then with the aid of the written solutions.

Have the students write directions for navigating the maze that include distance (measured in steps) and directions (measured in cardinal direction terminology).

Have the groups take turns navigating the space- use the written directions and/or have the designers use verbal cues to help their classmates solve the puzzle.

** To extend this activity the students can create large scale mazes with chalk on playground space or painter's tape on the gym floor.*

EVALUATION

Evaluate the students' ability to collaborate within the group.

Evaluate the students' ability to apply mathematical skills and calculation in planning the maze.

Evaluate the students' written directions for clarity and comprehensiveness.

Evaluate the students' ability to use clear verbal cues to guide other students through the maze.