



A-maze-ing Forces

Combine art and science to let your students experience the wonderful fun they can have exploring gravity and inertia. They will plan and build a maze, the design of which is limited only by their imagination.

You will need:

Marble

Glue, tape or low-heat glue gun

Paint

Scissors

A variety of building materials which could include:

Regular, bendable or bubble-tea straws

Pipe cleaners

Craft sticks

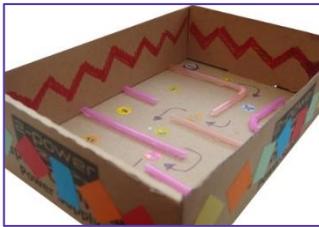
Card board or boxboard

Pencil

Eraser



What to do:



1. Working individually or in pairs, have students draw their design on a piece of cardboard or the inside of a cereal box, using their pencil.
2. Once they're happy with their design, have them build a bumper along the outside edges of the cardboard to keep the marble within the maze. The bumper can be created using bubble-tea straws, a double layer of regular straws, or craft sticks standing on their edge. They will need to leave an opening at the end of their maze so that the marble can exit the maze. If they are using a cereal or tissue box this step can be omitted, as the sides of the box will act as a bumper.
3. Once the bumper has been built, have students glue or tape the building materials in place to create a 3D maze based on their design. If desired, they can paint the pathways of their maze.
4. Once the paint is dry, they can place the marble at the start of the maze to begin their exploration of gravity and inertia.
5. Have students investigate the relationship between the magnitude of the slope and the speed/direction of the marble. Have students swap mazes and test each other's creations.

What is happening?



Newton's first law of motion states that an object will remain at rest or in uniform motion, travelling in a straight line, unless acted upon by an external force. This will be evident to students as they tilt the maze, taking advantage of unbalanced forces, to move the marble.

They should also notice that the marble travels in a straight line until it comes into contact with an obstacle. At this point the marble will either stop or be redirected, depending on the slope of the cardboard. If the marble is redirected, it will begin to move in a new direction, along a straight path, until it comes into contact with the next obstacle. What happens when they replace the marble with a small pom-pom?

