

MARBLE MAZE

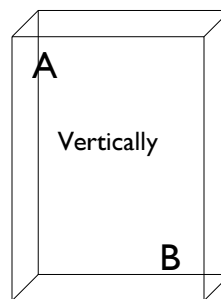
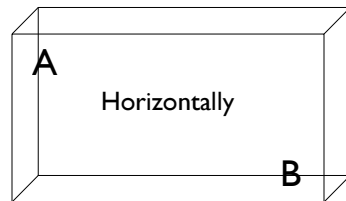


OBJECTIVE

Students will design and construct a maze that will allow a marble to travel from point A to point B in the LONGEST time possible.

REQUIREMENTS

1. You may use only the materials provided, but you do not have to use everything.
2. The marble must start in one corner (Point A) of the soda flat and end at the opposite corner (Point B).
3. The maze must be positioned either vertically or horizontally, with no more than 5 degrees tilting/ slanting backwards.



4. The marble cannot fall out of your maze, and it has to constantly be moving for the time to count.

TOOLS & MATERIALS

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|----------------------------|---------------------------------------|
| 1. 1 - Cardboard soda flat | 7. 1 - Toilet paper rolls |
| 2. 1 - Marble | 8. 1 - Sheets of 8 1/2 x 11 cardstock |
| 3. 1 - File folders | 9. 2 bottle caps 1ft |
| 4. 1 - Straw | 10. 1 ft- Masking tape |
| 5. 3 paper clips | 11. Stapler |
| 6. Scissors | 12. Ruler |

KEY TERMS

1. **Slope:** The slope or the gradient is commonly used to describe the measurement of the steepness, incline, or grade of a straight line. A higher slope value indicates a steeper incline. The slope is defined as the ratio of the "rise" divided by the "run" between two points on a line.
2. **Friction:** Friction is the force that opposes the relative motion or tendency toward such motion of two surfaces in contact. When contacting surfaces move relative to each other, the friction between the two objects converts kinetic energy into thermal energy, or heat. Friction between solid objects and fluids (*gases or liquids*) is called drag.

HELPFUL HINTS

1. Think about slope. If you have a steep slope, your marble will travel very fast.
2. Think about friction, what can you do to slow the marble down?
3. Think creative! Use funnels, tunnels, speed bumps to make your marble slow down or travel greater distances.
4. The further your marble travels, the longer your marble will be moving!

TESTING

1. A stopwatch will be used to time the travel of each marble.
2. Students will be allowed to place the marble at the starting position and release the marble.
3. Once the marble has begun its journey, no one may touch the marble or the maze.
4. If the marble gets stuck in the maze, you have to start over.
5. Time will begin when the marble is released from point A and when the marble reaches point B.
6. Each device will have three attempts and the best time will be recorded.
7. Appearance and construction will be considered in the grading.

TOTAL: 35 POINTS