

Name: _____

Date: _____

The Domino Effect

Purpose: To investigate the ways in which distance, time, and average speed are interrelated by maximizing the speed of falling dominoes. To become familiar with elementary graphing techniques.

Hypothesis:

I predict that dominoes spaced close together will have a _____ toppling speed.

I predict that dominoes spaced farther apart will have a _____ toppling speed.

Equipment:

Fifty dominoes

stopwatch

meterstick

Procedure:

1. Setup fifty dominoes in a straight row, with equal spacing between them. The dominoes must be spaced at least the thickness of one domino apart. Your goal is to maximize the speed at which a row of dominoes falls down. Set the dominoes in a way that you think will give the greatest speed.
2. Measure the total length of your row of dominoes and record.
3. Determine the average spacing distance between dominoes by measuring the length from the middle of the first domino to the middle of the last. Divide by the number of domino spacings and record.
4. Measure the length of a domino and record.
5. Record the time it takes for the row of dominoes to fall over.
6. Repeat for enough trials to complete the chart. Include one that has a spacing as small as you can make it and one that is large as you can make it and still produce toppling.

Data:

| Trial | Length of row (cm) | Average spacing (lengths) | Time (s) | Speed (cm/s) |
|-------|--------------------|---------------------------|----------|--------------|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |

Analysis/Calculations:

1. Construct a graph of speed vs. domino spacing. Include the class data and sketch the best-fit **line or curve**.
2. Show how the average speed was calculated for one trial.

Conclusion:

1. What are the factors that affect the speed of falling dominoes?
2. Why do we use the term average speed of the dominoes and not instantaneous speed?
3. From the graph, determine the maximum and minimum toppling speeds.
4. Compare your predicted toppling speeds to the actual speeds. Were you surprised by the results?
5. Use the speed equation to determine how long would a row of dominoes be if it took one minute to fall at:
 - a. maximum toppling speed
 - b. minimum toppling speed