PS Physics
Chapter 2

Name _____ Period _____
Partners_____

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 techniques of graphing motion.

Background information: A central property of motion is *speed*—the rate at which distance is covered. By rate, we mean how many of something per unit of time: how many kilometers traveled in an hour, how many feet moved in a second, how many raindrops hitting a roof in a minute. When we measure the speed of a car, we determine how many kilometers per hour. But when we measure the speed of sound or the speed of light, we measure the rate at which energy moves. We cannot see this energy. We can, however, see and measure the speed of the energy that makes a row of dominoes fall.

Materials:

- 25 dominoes
- stopwatch
- meterstick

Procedure:

1. Set up 25 dominoes in a straight row, with equal spacing between them. Your goal is to maximize the speed at which a row of dominoes falls down. Set the dominoes in a way you think will give the greatest speed. Record the spacing distance between the dominos in the data table.

2. Measure the total length of your row of dominoes. To measure this distance, measure the length from the middle of the first domino to the middle of the last one. Record this data.

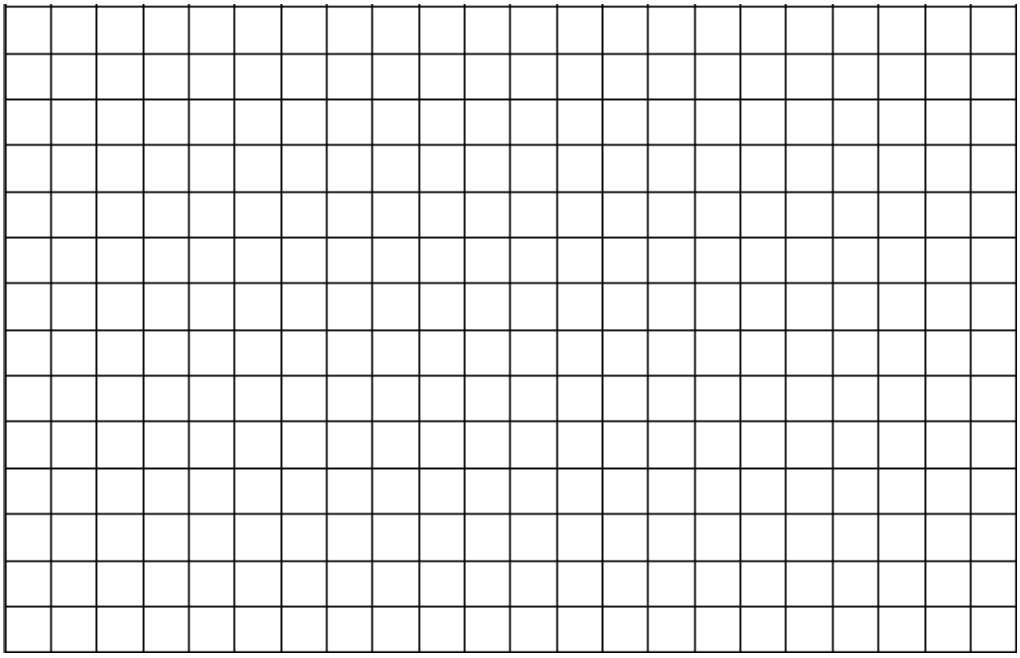
3. Measure the time it takes for your row of dominoes to fall down. Record your data.

4. Calculate the average toppling speed for your row of dominoes.

5. Repeat Steps 1-4 for 9 more trials with different size spaces. Include in your trials a spacing that is about as small as you can make it and still produce toppling and a spacing that is about as large as you can make it and still produce toppling. Record your data.

Trial #	Total Distance (cm)	Spacing (cm)	Time (s)	Speed (cm/s)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

6. Graph the average speed (dependent variable) vs. the spacing between dominoes (independent variable). Draw a smooth curve through the points.



Analysis:

7. What is the definition of average speed?

8. What are the factors that affect the speed of falling dominoes?

9. From your graph, what was the maximum toppling speed? Which spacing distance created this speed?

10. At this rate of speed, calculate how long a row of dominoes would be needed to make line that takes 1 minute to fall.

11. Explain why the curve on your graph has the shape that it does.