Science 9

SPEED LAB

PURPOSE: to determine the speed of moving objects using the formula: V=d/t.

MATERIALS: ramp, steel ball, meterstick or metric tapes, textbooks, ruler

INTRO: The three kinds of motion are: slowing down, steady, and speeding up.

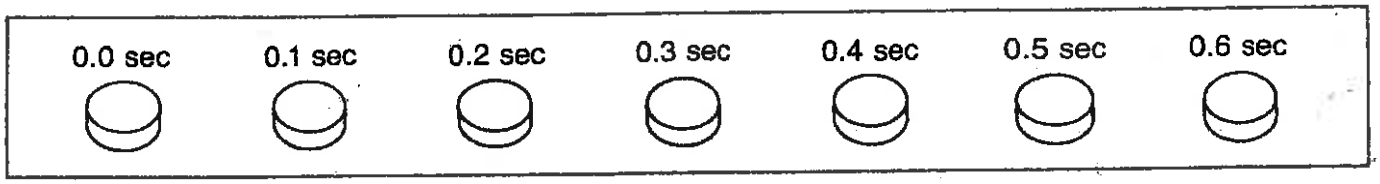
PART A -- *Slowing Down Motion.*

1. Place two textbooks on the floor. Rest one end of the ramp on the textbooks.
2. Place the ball in the groove at the top of the ramp. When the person timing is ready and WITHOUT PUSHING THE BALL, let it roll down the ramp.
3. Start timing as soon as the ball hits the floor. Let it roll for 2 seconds and then stop the ball.
4. Measure the distance the ball rolled from the end of the ramp.
5. Repeat two more times. Record all the data in the table below.
6. Redo steps 2 through 6, letting the ball roll for 4, 6, 8, and 10 seconds.
7. Calculate the average distance the ball rolled. Then calculate the average speed of the ball. Use the equation: Speed = Distance ÷ Time
8. Construct a distance-time graph.

TIME (sec)	Distance (centimeters)				Speed (cm/sec)
	Trial 1	Trial 2	Trial 3	Average	
0	0	0	0	0	0
2					
4					
6					
8					
10					

PART B -- *Steady motion*

1. The illustration below represents a series of flash photos of a dry-ice puck sliding across the floor. The time between each flash is 0.1 second.
2. Measure the distance from the left side of the first puck to the left side of the second puck. Record this data.
3. Measure the distance from the left side of the first puck to the left side of the third puck. Record this data. Repeat for the remaining pucks.
4. Calculate the speed of the ball for each distance using the equation:
   SPEED = DISTANCE ÷ TIME Enter it on the data table.
5. After you have performed all the calculations, construct a distance-time graph.



Time (sec)	Distance (cm)	Speed (cm/sec)
0	0	0
0.1		
0.2		
0.3		
0.4		
0.5		
0.6		

PART C -- *Speeding up motion*

1. The following data table shows the results of a rocket launch.

2. Calculate the speed of the rocket for each of the first six seconds of the flight.

3. Construct a distance-time graph of the data.

ROUND OFF TO THE NEAREST WHOLE #.

Time (sec)	Distance (miles)	Time (hours)	Speed (miles/ hour)
0	0	0	
1	0.01	0.00028	
2	0.08	0.00056	
3	0.2	0.00083	
4	0.6	0.00111	
5	1.3	0.00139	
6	2.5	0.00167	

Science 9 Speed Lab Report Names _____

_____

HOUR _____ _____

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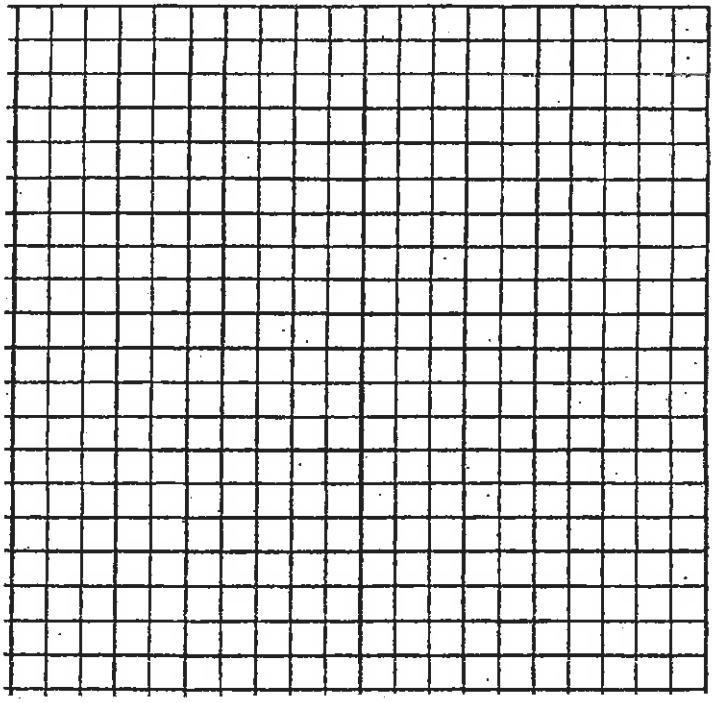

Choose among the following for the questions 1-3:
straight, curves up, curves down

1. What is the shape of a distance-time graph when motion is slowing down? _____

2. What is the shape of a distance-time graph when motion is steady? _____

3. What is the shape of a distance-time graph when motion is speeding up? _____

4. In Part A, which two forces were acting on the ball as it rolled? _____