

LAB #2: PULL-BACK MOTION

Be Here, Be Ready, Be Safe!

NAME: _____

DATE: _____

WEEK: _____

PTS. EARNED: _____

1. Define the Question:

Lab Question:

How will speed, velocity, and acceleration be utilized in the lab?

2. Gather information and resource:

Information: The lab will consist of pull-back cars and how we can calculate speed, velocity, and acceleration. The materials that will be used include: a stop watch, pull back cars, meter stick, and measuring materials (tape, paperwork, sharpie, etc.). The lab will be performed out in the hallway for more space. Students will be in groups of 3 to complete the lab.

3. Form the hypothesis:

Hypothesis

How fast (in general – fast, slow, numerical value, etc.) will the pull-back car go?

4. Plan the experiment:

Plan: One student is the timer (stopwatch), one student is in possession of the car (car), and one student will record the distance (meterstick).

1) Take materials – pull-back car, meterstick, tape, paper, sharpie, pencil, etc. – and go out into the hallway; remember, OTHER CLASSES ARE GOING ON SO BE RESPECTFUL!!!

2) Take a piece of tape and label it START. This will be the START line – place it on the floor of the hallway. Make sure you have plenty of room in front of the START line (this will be the path of the pull-back car).

3) Have one student stand in front of the START line far enough to label the FINISH – T1 line of where the car will eventually stop (only when the car stops!!!). When the car's path has finish, this person will label a piece of tape FINISH – T1 and place it exactly where the car stops its movement.

4) The person with the car will now “wind up” the pull-back car – make sure that you do not pull back too far and break the car. Afterwards, hold the car in place right on the START line.

5) The person with the stop watch will now wait until the person holding the car lets go – use a start count so that you can be accurate! When the person lets go of the car, record the time it takes for the car to eventually stop – make sure to stop the stop watch at this time. (It is okay if the car does not follow a straight path).

6) Record the distance and time for T1 (trial 1) in the table below. Then rotate jobs / responsibilities so that each person has a chance – you will record 3 trials below in the table.

5. Perform the experiment and collect data:

*** Speed is distance over time, velocity is speed with direction. ***

<i>Trial (1, 2, 3)</i>	<i>Distance (m)</i>	<i>Time (s)</i>	<i>Speed (m/s)</i>	<i>Velocity (m/s direction)</i>
1				
2				
3				

6. Analyze data:

Data: Write the following down for each trial below (speed, velocity, and acceleration from the beginning to the end of the car's movement – acceleration for this lab WILL NOT be a numerical value but describe it – is the acceleration increasing, constant, or decreasing?).

Trial 1

Speed: _____ Velocity: _____ Acceleration: _____

Trial 2

Speed: _____ Velocity: _____ Acceleration: _____

Trial 3

Speed: _____ Velocity: _____ Acceleration: _____

7. Interpret and draw conclusions that help refine the hypothesis:

Interpret and Conclude: Compare the results above from the three trials in part 6. How do they compare speed wise? Velocity? Acceleration?

Compare the results of the lab to your prediction of how fast the pull-back car went.

8. Communicate results:

Communicate:

How did the lab go? What worked well and what didn't?

What are some of the factors that could have altered or changed our results?

What could we have done to change the path or movement of the pull-back car during the lab?
