

Cars Speed Lab



PURPOSE:

Find out how fast (Average Speed) your pullback car is traveling at different distances.

MATERIALS

1 Car, 1 Stopwatch, 1 Calculator, 1 Meter Stick, and 4 Rulers

What you will need to include or show in your notebook for this lab:

1. A sketch or drawing of your experimental design. Make sure it you shows where you placed the meter sticks, where the car initially started, and the average distances reached for each trial (at the end of the lab you will do this one). It can be a side view or bird's eye view.
2. Write down (right now) the formula for **AVERAGE SPEED**.
3. Create a Data Table with the data you will need to collect for average speed. (include all units)
4. Calculations - (all work and units shown) to find the average speed of the car at the different distances.
5. Make a graph (1/3 of a page or bigger) for your cars speeds for the 3 trials. Plot each distance and corresponding time on your graph. Make each trial a different colored line.
6. Answer Post-lab questions in complete sentences.

DIRECTIONS:

1. Do not write on this lab. Please write lab in your science notebook. Groups of 3 or 4.
2. Use your Physics #1 Equation Notes we took in class to help with the calculations. When doing calculations for this lab, please SHOW ALL WORK & FORMULAS. Yes, show your work please.
3. Copy down Data Table I below to record measurements. For this lab you should have a minimum of 4 trial runs per experiment. (*Use average distance & average time for graphing*).
4. Be careful with the cars. They are not very resistant to damage and breaking. Make sure you follow the guidelines for use.
5. Please make sure not to launch the cars unsafely or cause them to crash into objects. If you are an unsafe driver you will be given the opportunity to learn safely and directly from the textbook.

**A "clicking" sound more than once or twice is bad.
Do not keep pulling backwards any further.**



6. You should use **distance measuring devices** and **timing devices** as needed.
7. Place the nose of the car at **20 cm, 40 cm, or 80 cm** (depending on trial) and **GENTLY** pull the car back to **0 cm** (zero) on the meter stick.
8. Make sure you have someone timing when you release the car. **You can all use the same data** and do not need to each do the trial runs. Make sure you **share** tasks.
9. If you **car does not work** bring it back to the shop to trade for another one that works.
10. Please **cleanup** your equipment the last 5 minutes of the period. Make sure all your equipment is accounted for before the bell rings. **Return cars to the front of the room for repair and maintenance if needed.**

Data Table I: Distance vs. Time for Pullback Cars

Trial #1	Pullback Car 20 cm	
	Distance (cm)	Time (sec.)
Run #1		
Run #2		
Run #3		
Run #4		
Average:	_____cm	_____sec.
Trial #2	Pullback Car 40 cm	
	Distance (cm)	Time (sec.)
Run #1		
Run #2		
Run #3		
Run #4		
Average:	_____cm	_____sec.
Trial #3	Pullback Car 80 cm	
	Distance (cm)	Time (sec.)
Run #1		
Run #2		
Run #3		
Run #4		
Average:	_____cm	_____sec.

POST-LAB QUESTIONS:

1. At what pullback distance did your car have the **greatest average speed**? What was the average speed?
2. At what pullback distance did your car have the **smallest average speed**? What was the average speed?
3. Name **four** things you could do to increase the average speed of your car.
4. Was your car ever going faster or slower than your avg. speed? Explain how you know
5. Name three reference points or frames of reference you could use to determine motion.

