

Physics

Motion Graphs DIY

Name: _____ Block: _____

We have spent a lot of time analyzing and interpreting position-time and velocity-time graphs. You have also created motion graphs based on a description you were given. In this lab, you will record your movements and then create both P-T and V-T graphs based on data your group collected.

Materials

- Stopwatch (5)
- Football field
- Six people

Procedure

1. Five students with stopwatches stand at uniform intervals. The student who is walking begins before the starting line so that s/he has a constant speed when the stopwatches begin.
2. When the walker passes the starting line, s/he shouts GO! All timers start their stopwatches at the same time.
3. When the walker passes a timer, that timer stops his stopwatch.
4. Record your data in the table below.
5. Repeat the procedure using these variables: a) walker is speeding up over time and b) walker is slowing down over time.
6. Create position-time graphs (use line of best fit for T1) and velocity-time graphs for each trial.

Data Table

Timer	Trial 1: Constant Velocity		Trial 2: Increasing Velocity		Trial 3: Decreasing Velocity	
	Time	Position	Time	Position	Time	Position
1		5 yards		5 yards		5 yards
2		10 yards		10 yards		10 yards
3		15 yards		15 yards		15 yards
4		20 yards		20 yards		20 yards
5		25 yards		25 yards		25 yards

Questions

1. Calculate the average speed for your walker from Trial 1. Compare this calculation to the slope from your position-time graph.
2. Based on your walker's motion, do your graphs seem to make sense? Explain.
3. CHALLENGE – Based on your knowledge of the relationship between P-T graphs and V-T graphs, attempt to create an ACCELERATION-TIME graph for each of your three trials.