Author:

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AP Physics

Date:

Time:

Acceleration Lab: Using a ticker tape timer to determine the acceleration of a falling object

INTRODUCTION

Paragraph 1: very general information, approximately 4-5 sentences taking the reader to your second paragraph

Paragraph 2: about the first concept acceleration) (sentences 1-5)

1. General
2. General
3. Specific
4. Specific
5. Transition to the next paragraph

Paragraph 3: about the second the ticker timer and how it works (sentences 1-5)

1. General
2. General
3. Specific
4. Specific
5. Transition to the next paragraph

Paragraph 4: connecting the two concepts together (Ticker timer and Acceleration)

1. General

2. General

3. Specific

4. Specific

5. Transition to the next paragraph

Paragraph 5: The upshot paragraph (sentences 1-4)

1. The purpose of this lab was to …..

2. (*you may copy this verbatim*) We hypothesize that the acceleration caused by gravity could be measured using two methods the first method was through the use of three equations (Final Velocity, Total Time, and Acceleration). The second method was through the use of graphing of final velocity versus time and determining the slope, which would be acceleration. We would accept our hypothesis if just one of our trials was within 10% of the true value for acceleration 9.81m/s^2.

3. We accept /reject based on the data that ……

4. Give specific data numbers

MATERIALS METHODS

Ticker timer: (1 paragraph explaining how to work the timer)

Equations: (1 paragraph explaining using an example of the equations):

Vf=m/0.0167s,

a = (Vf – Vo) /t,

D= ½ a t^2.

Ti Graphing: (1 paragraph explaining the STAT listing functions on the TI calculator) Using the STAT function on a Texas Instrument (#), calculations were made to plot_____ vs. _____ and obtain a linear regression. L1 consisted of the number of dots from the start (5,10,15,20). L2 ….

RESULTS

TABLE 1: Data from equation method to determine acceleration

Trial	Total Dots[A]	Time Transpired[B]	Distance last two dots[C]	Final Velocity[D]	Acceleration[E]	Percent Error[F]
1						
2						
3						

A= Measure from ticker timer

B= Dots / 60

C= measured in meters

D= Distance last two dots ÷ 0.0167

E= (Final velocity ÷ Total time)

F= (|derived acceleration – 9.81|) ÷ 9.81

TABLE 2: Trial 1 Distance traveled from start (meters) to determine acceleration via graphing

Dot Position	Distance traveled from start in meters[A]	Time transpired in seconds[B]	Falling Average velocity[C]	Falling Final Velocity[D]
5				
10				
15				
20				

A=

B=

C=

D=

TABLE 3: Trial 2 Distance traveled from start (meters) to determine acceleration via graphing

Dot Position	Distance traveled from start in meters[A]	Time transpired in seconds[B]	Falling Average velocity[C]	Falling Final Velocity[D]
5				
10				
15				
20				

A=

B=

C=

D=

TABLE 4: Trial 3 Distance traveled from start (meters) to determine acceleration via graphing

Dot Position	Distance traveled from start in meters[A]	Time transpired in seconds[B]	Falling Average velocity[C]	Falling Final Velocity[D]
5				
10				
15				
20				

A=

B=

C=

D=

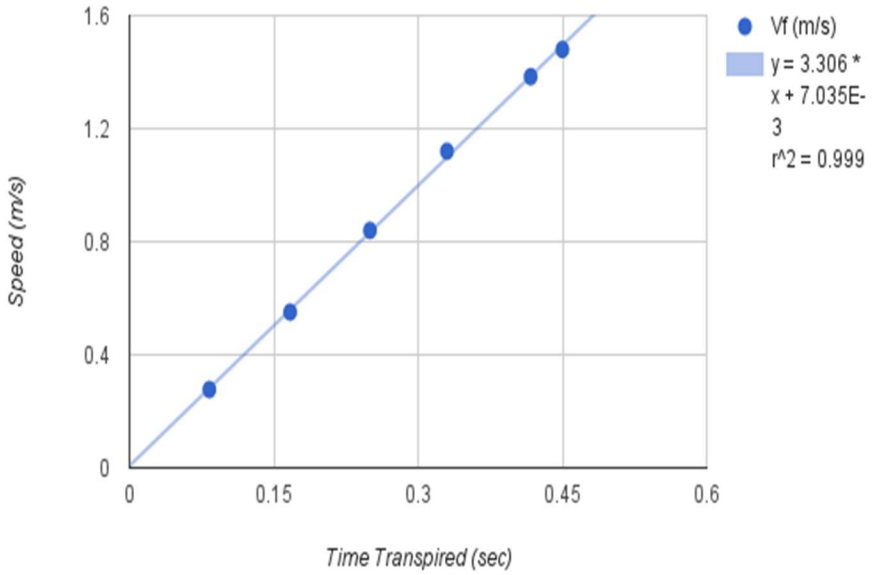

Figure 1: Trial 1: Speed in m/s Vs time slope is equal to the acceleration of the ball using the timer.

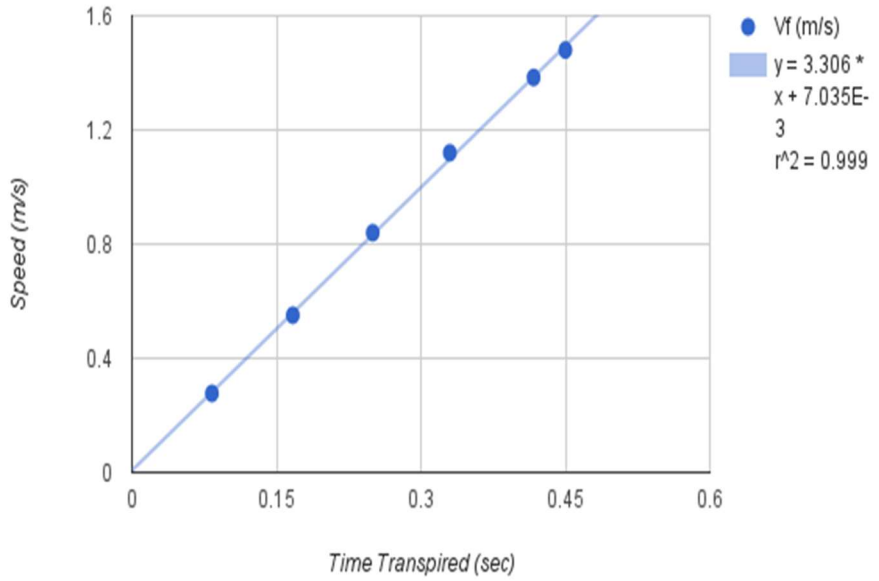

Figure 2: Trial 2: Speed in m/s Vs time slope is equal to the acceleration of the ball using the timer.

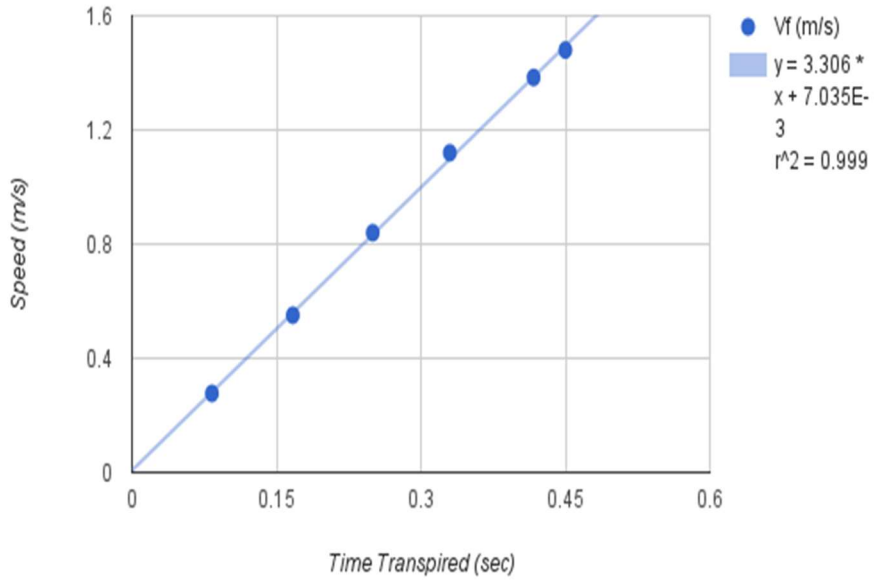

Figure 3: Trial 3: Speed in m/s Vs time slope is equal to the acceleration of the ball using the timer.

CONCLUSION

This section may use personal pronouns. There are four things you should cover in this section

1) Whether or not you accept or reject your hypothesis
2) Why you think the data agrees or disagrees?
3) What was your percent error?
4) Problems that occurred during the experiment?
5) What would be the next step, or how you could improve the experiment for it to work better?