

Ticker Tape Lab: Time, Distance, and Acceleration

Procedure:

1. obtain 6 ticker tapes, each a length of 150 to 200 cm long.
2. Label 2 tapes low height, 2 others medium height, at the last 2 high height.
3. Label on each tape the height of your apparatus from top of incline to the table top.
4. Attach tape to car as instructed by your teacher and place at starting position.
5. Start the ticker tape and release the car from the start line using a ruler as a gate. Be sure that the tape is straight before you release car so that it flows freely through the ticker.
6. After you have obtained all 6 ticker tapes, go back to your seat and mark a line across every 6th mark. Every 6 marks represents a tenth of a second.
7. Fill in the data table below of your results.

Data tables and calculations:

Low height: (_____ cm)

time	distance	distance	average distance	final velocity	final velocity	average velocity
t (s)	d (cm)	d (cm)				
.1						
.2						
.3						
.4						
.5						
.6						
.7						
.8						

medium height: (_____ cm)

time	distance	distance	average distance	final velocity	final velocity	average velocity
t (s)	d (cm)	d (cm)				
.1						
.2						
.3						
.4						
.5						
.6						
.7						
.8						

high height: (_____cm)

time	distance	distance	average distance	final velocity	final velocity	average velocity
t (s)	d (cm)	d (cm)				
.1						
.2						
.3						
.4						
.5						
.6						
.7						
.8						

Questions:

1. What relationship do you see on the tapes between the height of the apparatus and the distance between each .1 second interval?

2. What do you think the reason is for the above relationship in question 1?

3. Which tape had a higher average velocity? _____
4. Graph the ave. distance versus time on a graph for each height. You should have three lines on your graph.
5. Graph ave. velocity versus time on a graph for each height. You should have three lines on your graph.
6. What is the shape of the distance vs time graph?
 - a. Is the slope constant or changing? _____
 - b. what does this mean about the acceleration of the object?

7. What is the shape of the velocity vs time graph?
 - a. Is the slope constant or changing? _____
 - b. what does this mean about acceleration? _____
8. What would a distance vs time graph look like if the vehicle was going a constant speed?
9. What would a velocity vs time graph look like if the vehicle was going at a constant speed?
10. Calculate the Acceleration of each car using the velocity time graph. Be sure to include units and show all work below.
 - a. low height
 - b. medium height
 - c. high height