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Mrs. Geddes

AP Physics C

Motion Lab

Purpose:

The purpose of this lab is to create a story and use a motion sensor to gain an understanding of position and velocity.

Procedure:

1. Develop a story that involves rectilinear motion with a practical application.
2. Calculate the distance traveled and the velocities in the story.
3. Use the motion sensor to recreate the story with distances and velocities on a smaller scale.

Equipment:

1. Motion sensor
2. Labquest device

Data:

Story:

It is a lovely Saturday evening in the city of Dortmund. The time is 6:00 pm. It is the perfect setting for a football match between Borussia Dortmund and FC Schalke 04: the pitch looks brilliant, the stands are filled with excited fans sporting the distinct Dortmund yellow, and the weather is perfect. Both teams and the referee are on the pitch at Stadion Signal Iduna Park.

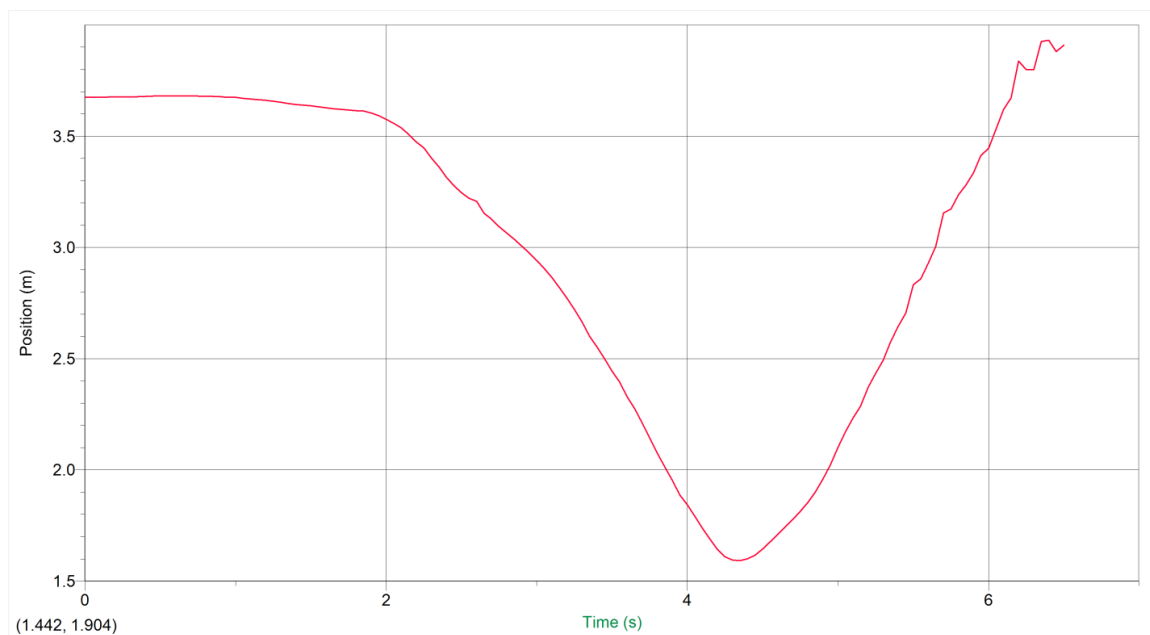
The game begins with a kickoff. Robert Lewandowski touches the ball to İlkay Gündoğan for 5 seconds (the ball has no velocity because it does not move in the horizontal plane). Gündoğan then passes the ball 10 meters to Sven Bender (the pass takes 3 seconds). Bender immediately passes the ball back 30 meters to Roman Weidenfeller (this took 5 seconds). Weidenfeller then clears the ball 50 meters in 10

seconds at a variable velocity.

Dortmund goes on to win the game 3-0.

1. The ball starts off in the center of the field at a stand still (as far as the x-axis is concerned) for 10 seconds
2. Passed back 10 meters away to the midfielder at 2 meter/second
3. then kicked 30 meters to the goalie at 6 meters/second
4. The ball is then punted 50 meters across the field at a velocity of 5 meters/ second

Graph:



Conclusion:

The graph for the experiment follows the data provided in the story. The position starts off at a relatively constant position then moves toward the origin before traveling away from the origin. The velocity starts at almost zero before decreasing, then approaches zero and increases. From this experiment, I was able to gain a further understanding of the interpretation of graphs of position versus time.