Pivot Interactives Fire Extinguisher Rocket Cart

Purpose: Analyze motion using Newton's 2nd Law.

Access the Pivot Interactives lab "Fire Extinguisher Rocket Cart". For this lesson we will be using the video and measurement tools, but we will be using an Excel spreadsheet for the analysis.

Scroll down to the video. You will see this:

First, run the video all the way through to see what is happening.

Then open the toolbox in the upper right hand corner of the video. Open the stopwatch and the ruler.

We are going to start the analysis at Frame 75 of the video. Hit the replay button and then RESET the stopwatch to zero. Step the video forward until you get to Frame 75. Then RESET the stopwatch again so that it reads zero seconds. Line up the ruler so that it reads 0 m at this point.

Open a spreadsheet and compile the data – time and position – in two columns (starting with 0 seconds and 0 meters).

Then step forward ten frames, and enter the time and position. Continue entering data for every tenth frame until the motion is complete.

On your spreadsheet, make a scatter plot of the position vs. time, and fit a polynomial trendline to the plot. Display the fitted equation on your plot.

Copy your plot into a Word document, and in the same document, answer these questions:

1) What is the acceleration of the cart?
2) Together, the cart and rider have a mass of 124 kg. What is the net force in the horizontal direction on the cart?
3) An independent measurement of the thrust of the fire extinguisher gave 120 N. Does that match your result? If not, what could account for the difference?

Convert your document to pdf and then submit the pdf document via Canvas.