

Honors Physics: Walking Activity

Directions:

1. Have a classmate film you on YOUR ipad walking across a room or down the hallway. Your video should be around 3-4 seconds long. Try to change speed gradually through your video. **DO NOT MOVE THE IPAD WHILE FILMING. YOU MUST MOVE THROUGH THE VIEW OF THE IPAD, THE IPAD CANNOT FOLLOW YOU.**
2. Make sure to include a meter stick in your video so that you can calibrate the video.
3. Upload your videos into the Vernier Video Physics App.
4. Choose a part of you that moves steadily (nose, shoulder, etc..., not your hand or leg that swings back and forth) and use that point as your reference in the next steps.
5. Set the origin of your axis on your reference point.
6. Calibrate your video using the meter stick and the $|\leftarrow\rightarrow|$ button.
7. Using the button on the far left, mark the location of your reference point every 0.3 seconds (you can advance by dragging the time bar or by pressing the double arrow button). Place the bull's-eye on the reference point and tap the center of the bull's-eye to make a dot.
8. Do this until you reach the end of the video.
9. Take a screen shot that shows all of the location dots on your video.
10. Insert this picture into Notability.
11. Answer these following questions below your picture in Notability (you can cut and paste them into Notability if you'd like).

Questions:

1. Are the dots on your screen evenly spaced or does the spacing of the dots change through the video?
2. What does it mean for the spacing between the dots to become smaller? What does it mean for the spacing to increase?
3. Calculate your average speed in your video by using the equation:

$$\text{Average speed} = \text{change in position (in meters)}/\text{Change in time (in seconds)}$$

or

$$\text{Average speed} = \Delta x/\Delta t$$

This may be easier to do using the graphing feature. To see an x vs. t graph, click on the graph icon in the upper right corner of the video screen. Swipe once to the right to view the x vs. t graph.

4. Now calculate the average speed for the first half of the video and for the second half of the video. How do they compare? Do the numbers support your observations regarding the spacing of the dots in question 1?
5. How is the speed represented on your x vs. t graph