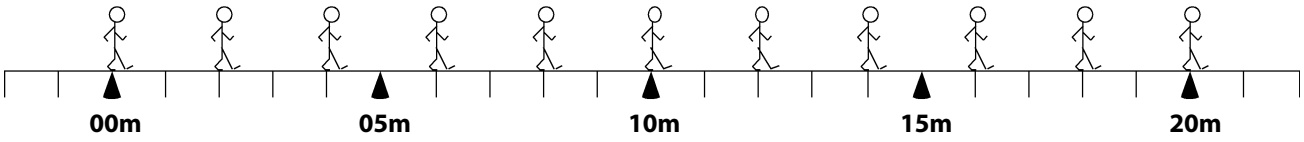
PhyzSpringboard
Making Motion Graphs

I. PLOTTING MOTION GRAPHS

The illustrations below represent photographs taken by a special camera. The camera records an image every second. Each image sequence begins at t = 0.



Consider the motion of Walking Dude illustrated above.

1. Above each image of the Walking Dude, record the clock reading at which each image was made.

2. Describe the motion.
   a. Is it uniform or accelerated? How do you know?

   b. If uniform, can the speed of the dude be determined? If so, how?

3. Complete the data table by recording corresponding position and clock reading values.

t (s)	0	1								
x (m)	0	2								

4. On a separate sheet of graph paper, construct a graph to represent the motion.

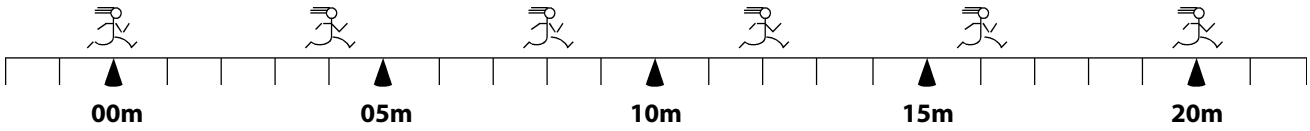
5. Create a second graph to represent the motion by transposing the data values.

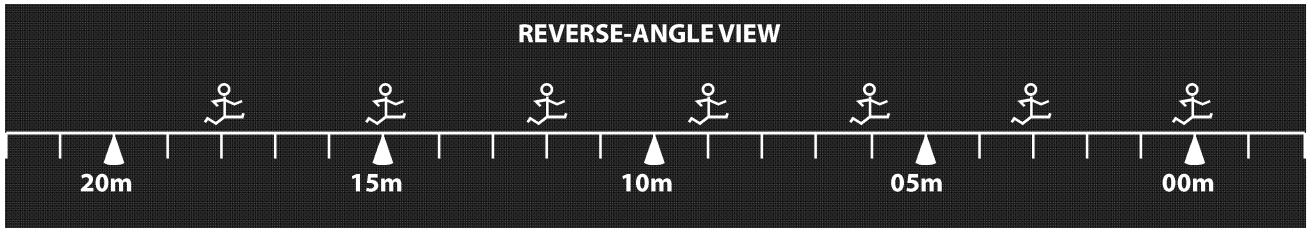
6. Give each graph an appropriate title. The title of a graph is the name of the physical quantities it represents. Position and clock reading are the quantities involved in our graphs. But who gets first billing in the title?
__the quantity on the horizontal axis
__the quantity on the vertical axis

7. Which graph is more useful and why? (Consider the graph of a faster- or slower-moving dude; consider the graph of a dude at rest.)

8. How can the speed of the dude be determined using the graph?

9. Add the motion graphs of the Running Dudette and Reverse-Angle Dude (shown below) to the graph of Walking Dude that was "more useful." Since you'll now have three plots on the same set of axes, label each one appropriately (i.e., "Walking Dude," "Running Dudette," and "Reverse-Angle Dude").





10. Toddler Dudette crawls at 0.5 m/s. If she crawls forward from 0 m, what would her motion graph look like? Add and label a "Toddler Dudette" plot to the axes used for the previous exercise.