

THE MOVING MAN: DISTANCE, DISPLACEMENT,

Background – Remember graphs are not just an evil thing your teacher makes you create, they are a means of communication. Graphs are a way of communicating by using pictures and since a picture is worth a thousand words knowing how to make and interpret graphs will save you a lot of writing. 😊

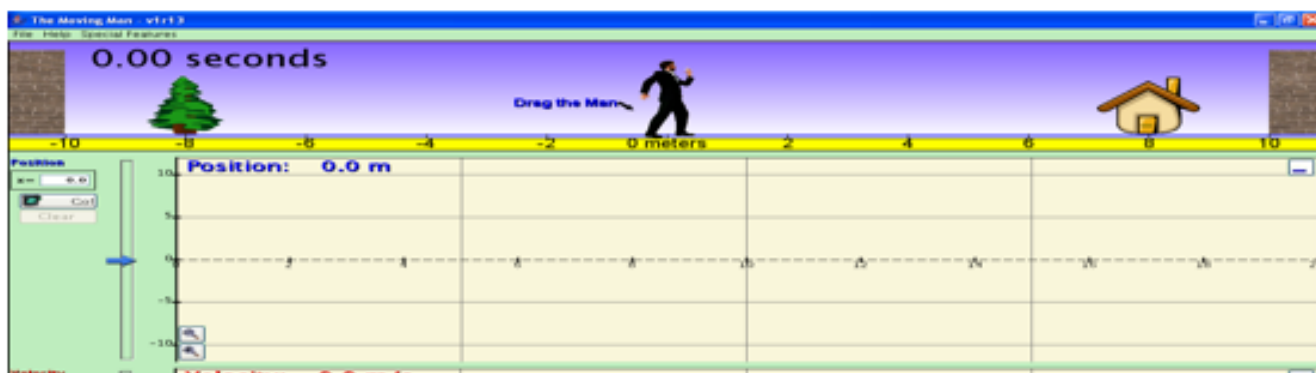
Learning Goals – The students will:

- Develop a general knowledge of
 - What graphs of a person standing still would look like
 - What graphs of a person moving away from an observer at a constant speed would look like.
 - What graphs of a person moving towards an observer at a constant speed would look like.
 - How differences in speed appear on the graphs

<https://phet.colorado.edu/en/simulation/legacy/moving-man>

Then click on “The Moving Man”

1. **Getting started.** After “The Moving Man” is open leave the position graph (distance vs. time graph) open. But close the velocity graph and the acceleration graphs by clicking on the blue minus buttons in the right upper corner of that graph. When finished, your screen should look like screen 1 below.



Screen 1

PART A: DISTANCE and DISPLACEMENT

Procedure – Do the following activity using this web site

2. Making Observations about Distance:

- A. What number and unit are written directly under the moving man? Number _____ Unit _____
- B. The position under the walking man which is labeled “0 meters” is called the “Reference Point”. It is the point from which all motion will be referenced. You can use any point as a reference point but in this case. We have chosen this point to be our starting “*reference point*”
- C. The amount of a certain unit between the reference point and an object is called the **DISTANCE**. Distance **does not** tell you anything about the direction from the reference point. It only has an amount and a unit.

NAME _____ DATE _____ PERIOD _____

D. In the table below record the distances requested in meters:

DISTANCE FROM Walking Man (reference point) to....	The House	The Wall	The tree

3. Making Observations about Displacement:

A. You may have noticed that the distance to the tree has been given a negative value while the distance to the house has been given a positive value. Stop and think for a moment. Why do you suppose this has been done?

B. When we add a “-“ or a “+” to the number we are indicating a **direction**. A “-“ sign means “backward or behind” and a “+” sign means “forward or in front”. They indicate the direction of an object from the chosen reference point. Adding the “+” or “-“ sign indicates **DISPLACEMENT (not distance)**. Displacement, like distance has an amount (**magnitude**) and a unit, but displacement also has a **direction**. Distance does NOT have a direction. When we want to indicate direction in more than two directions (e.g. forward and backward), we use words like north, south, east, west, northwest etc. We can also use degrees of a circle with the reference point being the center of a circle.

D. In the table below record the displacements requested in meters. Use “-“ and “+” to indicate direction from the reference point (Be sure to also include an amount and a unit.)

DISPLACEMENT FROM Walking Man (reference point) to....	The House	The Wall	The tree

What is the difference between an object’s DISTANCE and its DISPLACEMENT?
