Position, Motion & Displacement

Position = your spot as defined by a coordinate system & reference. Ie: GPS gives you a position relative to 0,0 of the globe. Symbol is $\vec{d}$

The half arrow $\rightharpoonup$ defines this as a vector. A **vector** has magnitude (#) and direction.

…whereas… scalar (no $\rightharpoonup$). **Scalar** has magnitude but no direction. My mass is 85 kg.

Distance = length of path travelled. Symbol = Δd

Δ = 'delta' in Greek and means change.

Motion (movement) = change in position.

Displacement = straight line distance between initial and final position and it has direction. Symbol is $\Delta\vec{d}$

example: $\Delta\vec{d}$ = 12 m [E] (from reference pt)

Position-Time graphs = $\vec{d}$/t graph . these are very helpful in analyzing motion.

Try these together:

1) I am fidgety as a bus stop. I pace 5.0 m [W] and then 10.0 m [E]. What is my final position? What is my distance travelled? What is my displacement?

2) I walk 2 blocks east and then turn and walk 6 blocks north. What is my distance and displacement?

3) Sprinting drills include running 40 m [N], walking 10 m [N] and then sprint 100 m [N]. What is the sprinter's displacement from the start point? Draw it out as well.

4) To perform a give and go, a basketball player fakes out the defence by moving 0.75 m [right] and then 3.5 m [left]. What is the player's displacement? Distance travelled? Draw it out as well.

5) While building a wall, a bricklayer sweeps the cement back and forth. If she swings her hand back and forth, (a distance of 1.7 m each way) four times, calculate the distance and displacement her hand travels during that time.

6) Do these following questions of a 'graph' grid made in your notebook. No need to use official graph paper unless you wish to. Make [north] as position direction.

a) Draw a position/time graph ($\vec{d}$/t graph) for a car sitting 30 m [N] of reference for 5 seconds.

b) Draw a $\vec{d}$/t graph for a car starting a reference and travelling in the northern direction at a constant speed. ie: every second, the car moves 4 m [south].

c) on the graph you drew in (b), draw another car travelling in the southern direction at a constant speed of 4 m every second. (same speed, different direction)