

NAME:

DATE:

# MODELING MOTION

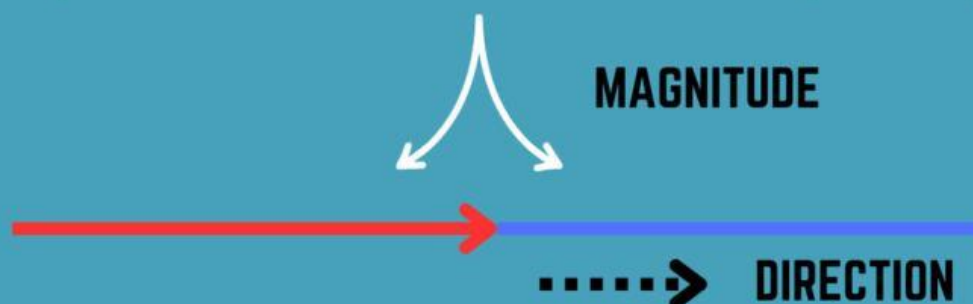
## VECTORS ON (POSITION) DISTANCE, AND DISPLACEMENT

What are vectors?

A vector is a quantity with both a direction and a size (magnitude). It's used in physics to describe things like acceleration, velocity, and forces. Displacement, which is the change in position from a starting point to an endpoint is also a vector.

What does magnitude in a vector mean?

Think of a vector as an arrow. This arrow shows two important things: which way something is going (its direction) and how much of it there is (its magnitude).



WHAT IS POSITION (IN PHYSICS)?

Imagine you and your friend are playing a game of hide and seek in your neighborhood. The spot where you're hiding is your "position." In physics, the position of an object is simply where that object is located in space compared to other objects around it.



BOY A IS 5 FEET FROM BOY B



## DISTANCE VS. DISPLACEMENT

Distance is about the total path you walked, and displacement is about where you ended up compared to where you started.

### DISTANCE

Represented by symbol  $d$   
and unit in meters (m)

### DISPLACEMENT

Represented by symbol  $\Delta x$   
and unit in meters (m)

The triangle represents change. In this case, it is change in position.

**DISTANCE = 4 METERS**

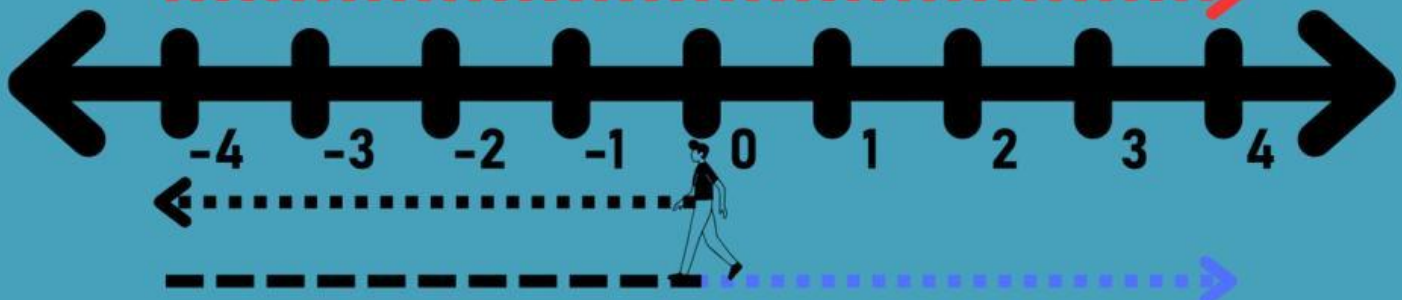


**DISPLACEMENT = 4 METERS**



To find distance, you add all the path taken  
4 m to the left  
8 m to the right  
 $8 + 4 = 12$

**DISTANCE = 12 METERS**



To find displacement, you only count from starting position to ending position.

**DISPLACEMENT = 4 METERS**



**Draw the vector of the direction Jake is walking.**



**If Jake walks 200 m west to the store. What are his distance and displacement?**



**DISTANCE:**

**DISPLACEMENT:**

**If Jackie walks 200 m west to school, and then walks back 200 m east to her house. What are her distance and displacement?**



**DISTANCE:**

**DISPLACEMENT:**