

1. Speed Velocity.notebook

KINEMATICS: Study of motion

MECHANICS: Study of objects in motion

MOTION: Change in position

VECTORS VS. SCALARS

DISTANCE: How much ground is covered. (**Scalar**, direction doesn't matter)

DISPLACEMENT: How much out of place from start. (**Vector**, direction matters)

Distance vs. Displacement

Alex forgot her pencil again and this makes Ms. Nigro pace back and forth around the room. Ms. Nigro walks 10m to the right, then 8m to the left, then 3m to the right, all in 10 seconds.

1) What's Ms. Nigro's distance covered?

2) What is Ms. Nigro's displacement?

VECTORS VS. SCALARS

SPEED: How much ground is covered per second. (**Scalar**, direction doesn't matter)

$$\text{Speed} = \frac{\text{Distance (m)}}{\text{Time (s)}}$$

VELOCITY: How much out of place from start per second. (**Vector**, direction matters)

$$\text{Velocity} = \frac{\text{Displacement (m)}}{\text{Time (s)}}$$

Speed vs. Velocity

Alex forgot her pencil and this makes Ms. Nigro pace back and forth around the room. Ms. Nigro walks 10m to the right, then 8m to the left, then 3m to the right, all in 10 seconds.

1) What is Ms. Nigro's speed?

2) What is Ms. Nigro's velocity?

3) When, if ever, will speed and velocity be equal?

Speed vs. Velocity

Akshay wants a new lab partner. He moves 3 m North and 4 m East in 1 minute.

1) What is Akshay's distance traveled?

2) What is Akshay's displacement?

3) What is Akshay's speed in m/s?

4) What is Akshay's velocity in m/s?

Speed and Velocity

Constant Speed
and
Constant Velocity

$$\bar{v} = \frac{d}{t}$$

\bar{v} = average velocity or average speed (m/s)
 d = displacement or distance (m)
 t = time (s)

- 1) Deanna is driving her car at 25 m/s East. What is her displacement after 40 seconds?
- 2) Joe's balloon drifts North at 1.6 m/s. How long will it take to travel 80 meters?
- 3) A sled travels 52 meters downhill in 4 seconds. Find the average speed.