Motion Mini Lecture

Speed

- Scalar
- Units: m/s
- Instantaneous Speed: Speed at a given time
- Average Speed: Total distance over a period of time

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

Velocity

- Vector
- Units: m/s + direction

V = displacement/time

$$\text{Velocity} = \frac{\triangle \text{Displacement}}{\triangle \text{Time}}$$

Practice

You travel 100 meters north in 10 seconds. What is your distance? Displacement? Time?

You run around the 400 meter track in 20 seconds. What is your distance? Displacement? Time?

Practice

You travel 100 meters north in 10 seconds. What is your distance? Displacement? Time?

Distance and Displacement= 100 m Time = 10 s

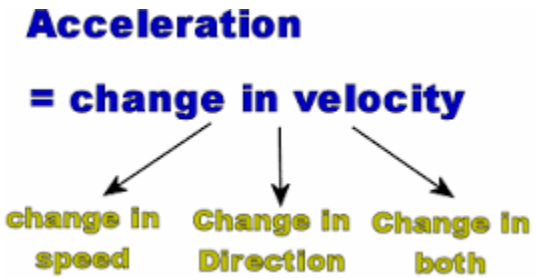
You run around the 400 meter track in 20 seconds. What is your distance? Displacement? Time?

Distance= 400m disp = 0 time = 20

Acceleration

- Vector
- Units: m/s^2, direction

$$\text{Acceleration} = \frac{\text{Change in velocity}}{\text{Change in Time}}$$



$$a = \frac{v_f - v_o}{t}$$

Practice

You speed up from 4 m/s to 7 m/s. Is your acceleration positive or negative?

You slow down from 4m/s to 0 m/s. Is your acceleration positive or negative?

You stay at a constant velocity of 3 m/s. What is your acceleration?

Practice Problems

You speed up from 4 m/s to 7 m/s. Is your acceleration positive or negative?

Positive

You slow down from 4m/s to 0 m/s. Is your acceleration positive or negative?

Negative

You stay at a constant velocity of 3 m/s. What is your acceleration?

No Acceleration = Constant Speed