Velocity & Acceleration
Speed

- the rate at which something changes position
Velocity (v)

- Speed and a given direction. units: m/s and a direction

SPEED

DIRECTION
SPEED

80 kilometers per hour

0km 80km

1 hour
VELOCITY

80 kilometers per hour East

0km → 80km

1 hour
Acceleration (a)

- the amount of change of velocity per unit of time. Units: m/s/s
Acceleration Formula

\[
\text{acceleration} = \frac{\text{change in velocity}}{\text{change in time}}
\]

\[
a = \frac{\Delta v}{\Delta t}
\]
How to calculate acceleration???

A cheetah accelerates from 2 m/s to 16 m/s in 7 seconds. What is the cheetah’s average acceleration?
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**Formula:** \( a = \frac{\Delta v}{\Delta t} \)

**Plug:** \( a = \frac{(16 \text{ m/s} - 2 \text{ m/s})}{7 \text{ s}} \)

**Solve:** \( a = 2 \text{ m/s/s} \)
Let's Review...

**Velocity:** is the measure of speed and a given direction
Symbol: \( v \)
Units: m/s and a direction (ex. 3m/s East)

**Acceleration:**
the amount of change of velocity per unit of time.
Symbol: \( a \)
Units: m/s/s