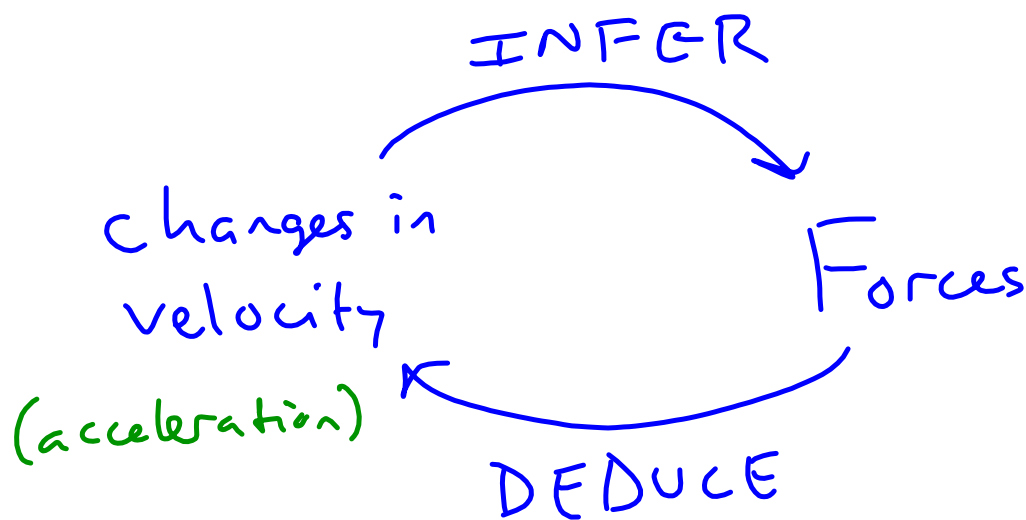


MODEL DESCRIPTION

Unbalanced Force Model

DESCRIPTION

Acceleration occurs when we have unbalanced forces.



PROPERTIES

• Measured

- Force (\bar{F}) \rightarrow N (lbs.)

- mass (m) \rightarrow kg

- displacement ($\Delta \bar{x}$) \rightarrow m

- angle (θ) \rightarrow $^{\circ}$ (degrees)

- time (t) \rightarrow s

• Calculate

- Net force (\bar{F}_{net}) \rightarrow N

- acceleration (\bar{a}) \rightarrow m/s²

- velocity (\bar{v}) \rightarrow m/s

- Coefficient of friction (μ) \rightarrow unitless

REPRESENTATIONS

- Written/Verbal
- Diagrammatic
 - Force Diagrams (Free-Body Diagrams)
 - Motion maps
- Graphically
 - Force-mass
 - Force-acceleration
 - $F_f - F_N$
 - mass-acceleration
- Mathematically
 - $F_{net} = ma$
 - Kinematics equations
 - $F_f = \mu F_N$ this equation relates the x- and y-directions
 - Trig relationships

RULES OF BEHAVIOR

- Unbalanced forces cause a change in velocity.
- If have acceleration, have a net force.
- Direction of net force and acceleration vectors is the same.