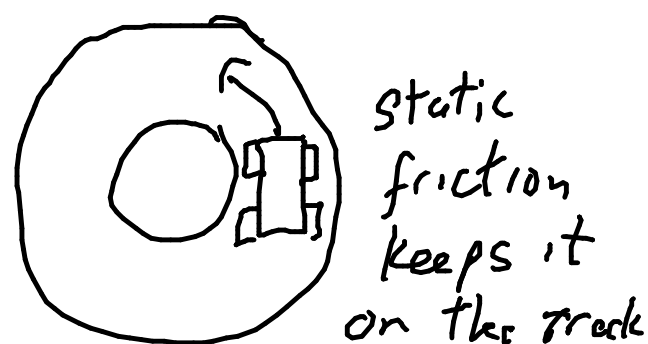
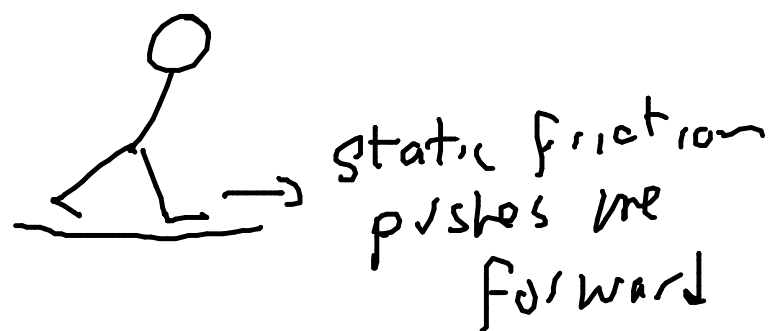


- Kinetic Friction \vec{k}
fixed, not adjustable
only if surfaces are sliding against each other


- Static Friction \vec{S}
adjustable but easily breakable
surfaces do not slide



Big 5: \vec{W} , \vec{N} , \vec{T} , \vec{k} , \vec{S}

- air resistance / "drag"
depends on velocity
generally points opposite direction of motion
non-adjustable (fixed)

wind

- propulsion  rocket ship

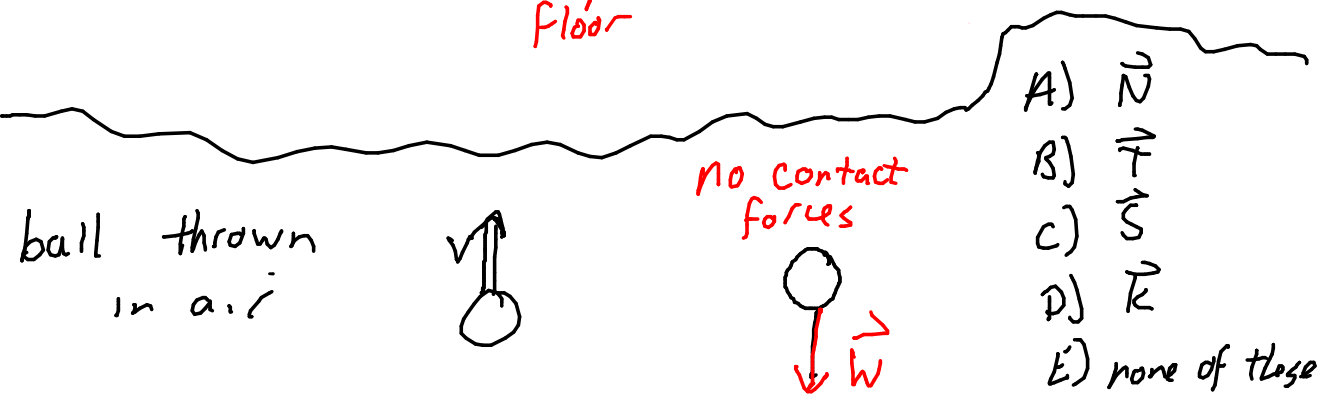
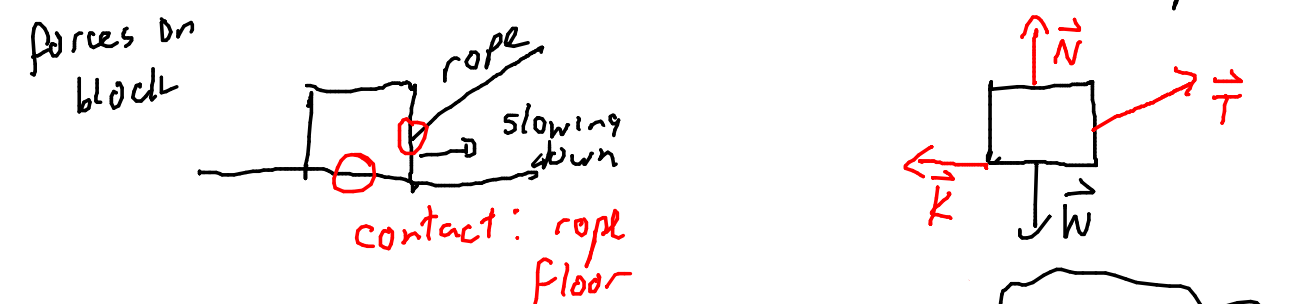
- buoyancy

- electric & magnetic forces

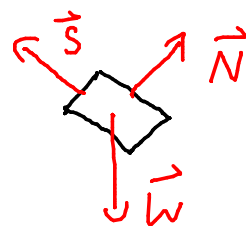
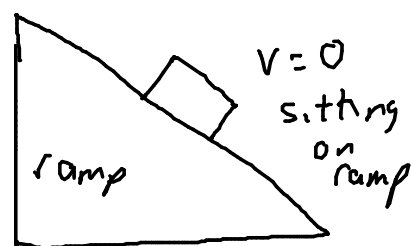
- Spring force (contact, combo \vec{N} & \vec{T})

Identifying Forces & Free-Body Diagrams

1. Draw object(s) of interest separately.
2. Identify noncontact forces & label with letter and an arrow.
(i.e. weight $\vec{W} \downarrow$) or $\downarrow mg$
3. Identify all contact points with environment. (Usually ignore air resistance.)
4. For each contact point
Is there N? T? K? S?
Could be multiple forces at each point.



Free fall
 $\vec{F} = m\vec{a} \rightarrow mg \downarrow = ma$
 $\therefore a = 9.8 \text{ m/s}^2 \downarrow$ in free fall
 (which we knew)



$\vec{F}_{\text{net}} = 0$ because $\vec{a} = 0$ not moving

$$\vec{S} + \vec{N} + \vec{W} = 0$$