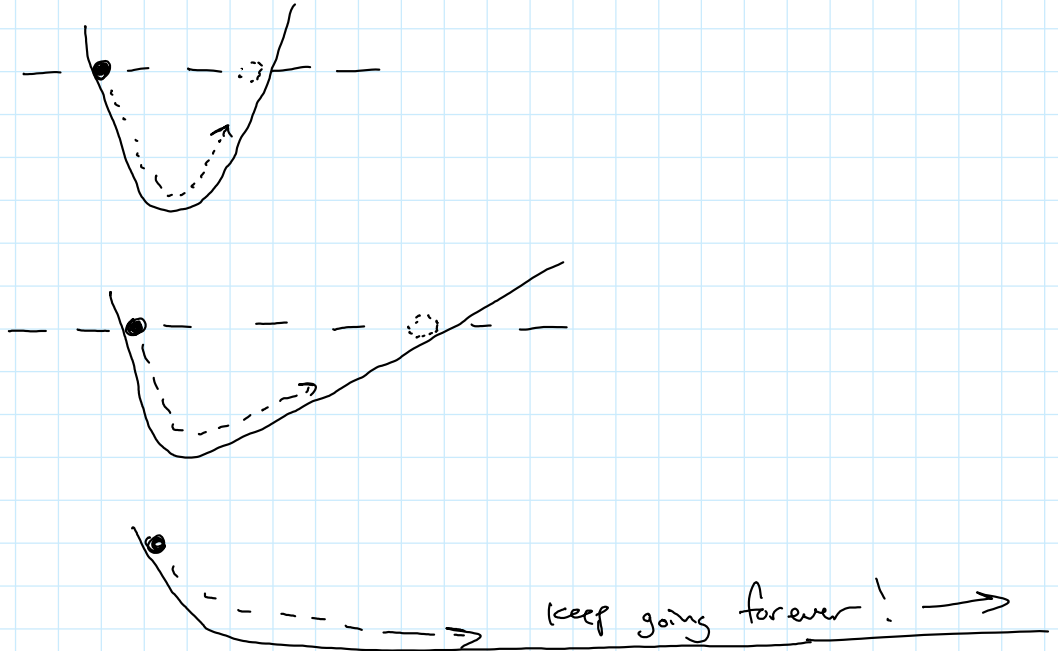


Forces and Newton's Laws

1) Inertia



At rest \rightarrow stay at rest

In motion \rightarrow stay in motion

a force is needed to change the motion of an object

Mass is the measure of inertia

2)

$$\vec{a} = \frac{\vec{F}_{\text{net}}}{m}$$

or

$$\vec{F}_{\text{net}} = m \vec{a}$$

units

Force	mass
r	r

Force	mass
N	kg
pounds	slug

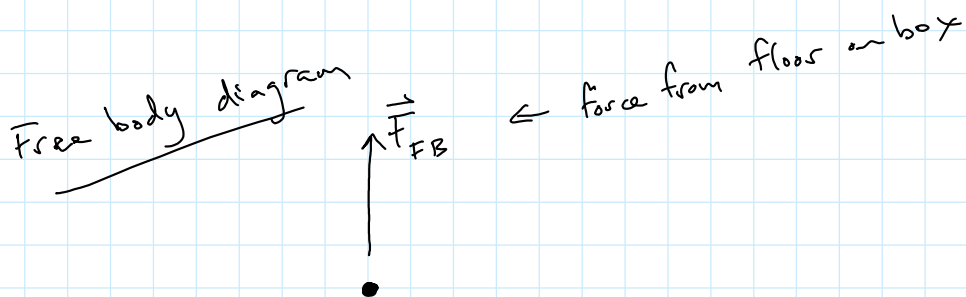
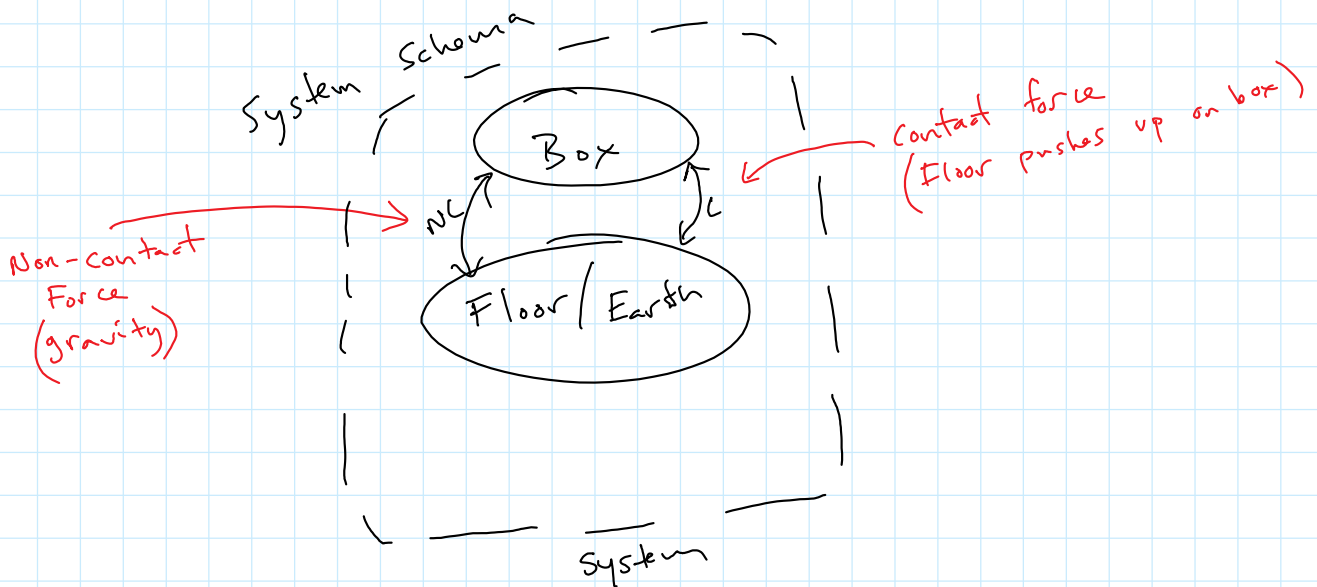
$$F = m a$$

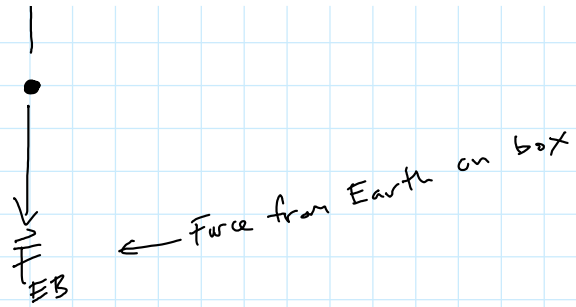
$$N = \text{kg} \frac{\text{m}}{\text{s}^2}$$

3) When 2 objects interact, they interact with equal and opposite forces

$$\vec{F}_{AB} = -\vec{F}_{BA}$$

Box sitting on the floor:





- T tension in a string of rope
- N Normal force from a surface
- f friction
- W or F_g for weight of force of gravity ($W = mg$)
- F other forces