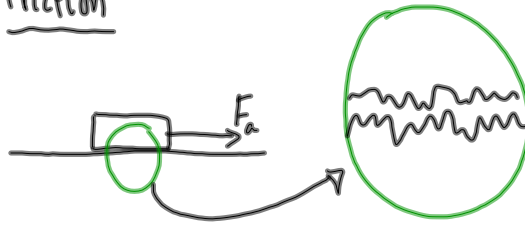


Friction



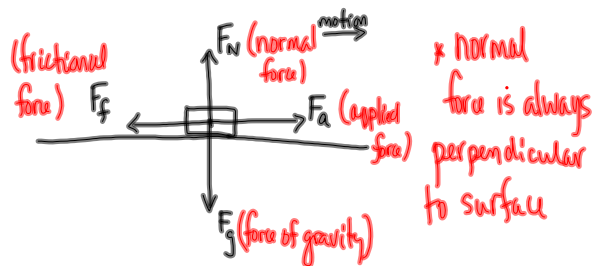
- friction depends on ① the nature of the two surfaces
 ② the weight

Static friction - the frictional force you need to overcome in order to just start an object moving

Kinetic friction - the frictional force experienced once the object is moving

Free Body Diagram (FBD)

Consider pulling a cart on a horizontal surface with a horizontal force. There is friction.



Static: The frictional force (F_f) is always equal to the applied force (F_a) up to and including the instant the object moves. $F_a = F_f$

Kinetic: If $F_a > F_f$ there is + acceleration
 If $F_a < F_f$ there is - acceleration
 If $F_a = F_f$ there is no acceleration (constant velocity)

$F_f \propto F_N$
 $F_f = \mu F_N$

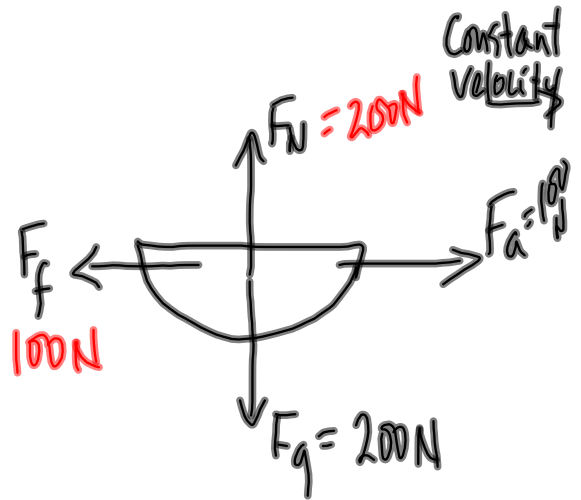
(note: $F_N = F_g$ IF horizontal surface horizontal F_a)

Where F_f is the frictional force (N)

F_N is the normal force (N)

μ is coefficient of friction

(depends on the surfaces + is determined experimentally)



$$F_f = \mu F_N$$

$$\mu = \frac{F_f}{F_N}$$

$$\mu = \frac{100\text{N}}{200\text{N}}$$

$$\boxed{\mu = 0.5}$$

← the coefficient of kinetic friction (determined experimentally)

A drag sled is used to find μ at an accident scene