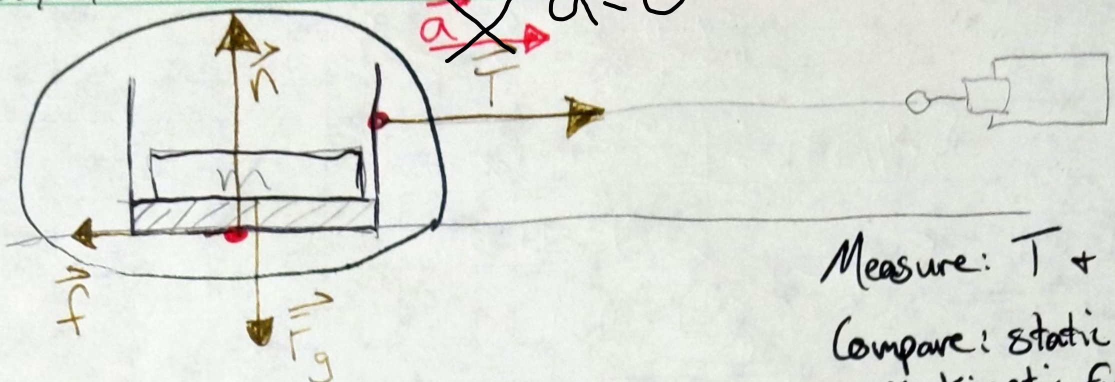
LAB 4: PHYS 221
05/07/2021

$\cancel{\vec{a}}\ \vec{a} = \vec{0}$



Measure: T + m

Compare: static friction vs. kinetic friction

$f_k(n, \text{area of contact})$

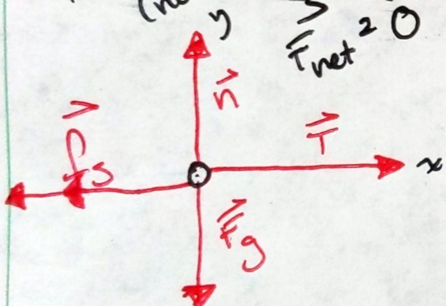
$f_{s_{max}}(n, \text{area of contact})$

$$f = \mu_f \cdot n \quad n = m \cdot g$$

model

w/ static friction (not moving)

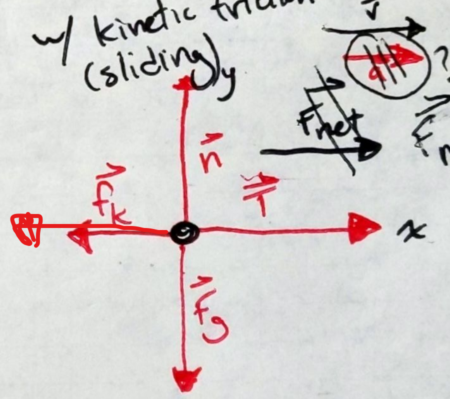
$\vec{F}_{net} = \vec{0}$



w/ kinetic friction (sliding)

$\mu_f = \frac{f}{n}$

$\vec{F}_{net} = \vec{0}$



Force	x-comp	y-comp
$\vec{T}$	$+T$	0
f_s	$-f_s$	0
$\vec{n}$	0	$+n$
$\vec{F}_g$	0	$-F_g$
a	0	0

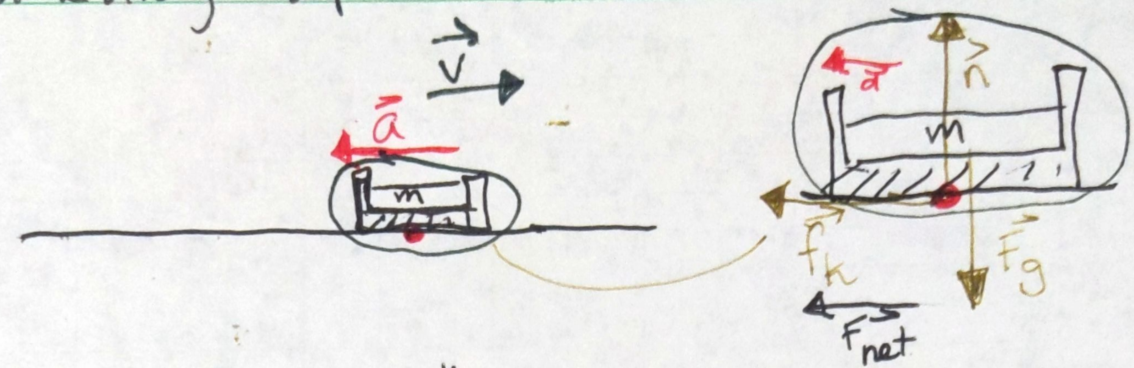
Force	x-comp	y-comp
$\vec{T}$	$+T$	0
$\vec{f}_k$	$-f_k$	0
$\vec{n}$	0	$+n$
$\vec{F}_g$	0	$-F_g$
a	$+\cancel{a}$ 0?!	0

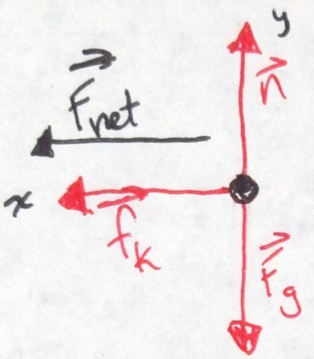
$$a_x = T - \mu_k \cdot g$$

$$F_{net_x} = T - f_k \ ; \ a_x = \frac{T - f_k}{m}$$

$$F_{net_y} = n - F_g \ ; \ a_y = 0 \qquad a_x = \frac{T - \mu_k \cdot \cancel{m} \cdot g}{\cancel{m}}$$

block sliding to stop





Forces	x-comp	y-comp
$\vec{n}$	0	$+n$
$\vec{F_g}$	0	$-F_g$
$\vec{f_k}$	$+f_k$	0
a	$+a$	0

$$F_{net_x} = +f_k$$

$$a_x = \frac{f_k}{m}$$

$$a_x = \frac{\mu_k \cdot m \cdot g}{m}$$

$$a_x = \mu_k \cdot g$$

model:

$$f_k = \mu_k \cdot n$$

$$n = m \cdot g$$

As the box slides to a stop, it accelerates in the direction of kinetic friction exerted on the box as it moves across th ~~su~~ surface.

The two blocks experience the same acceleration, despite having different masses, because as shown above - mass does not affect th acceleration of the box in this model.

The acceleration for each box is the same, based on the coefficient of static friction and g (the gravitational component of the normal force)