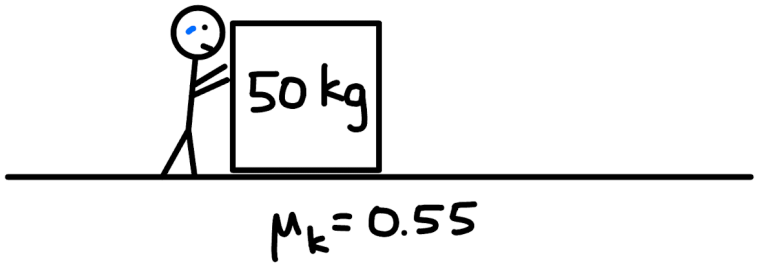
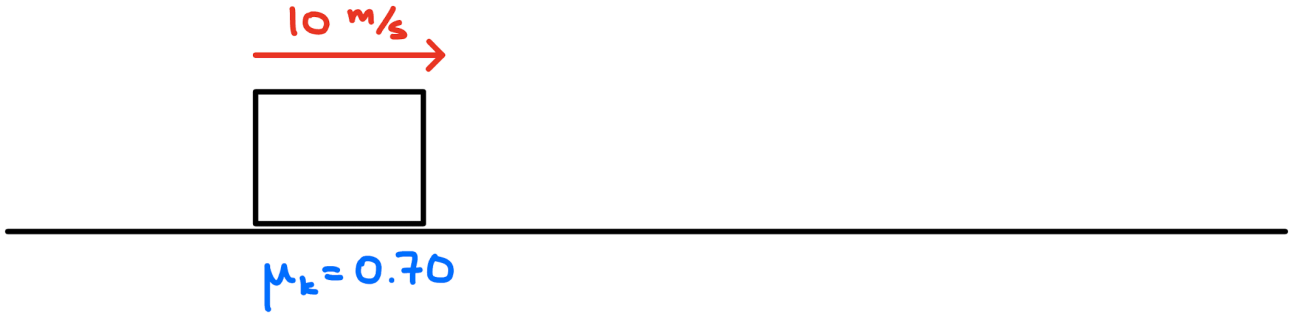
An 50 kg object is pushed with a force of 300 N. The coefficient of kinetic friction between the object and the ground is 0.55. Determine the acceleration of the object.



Snorlax has a mass of 460 kg. The coefficient of static friction is 0.70 and the coefficient of kinetic friction is 0.60. If Ash and his friends can exert a force of 2600 N, will they be able to move Snorlax out of the way? If so, what will be its acceleration? If not, how much additional force will it require?

An object is sliding with an initial velocity of 10 m/s across a rough surface (μ_k = 0.70). How much time will it take for the object to come to rest?



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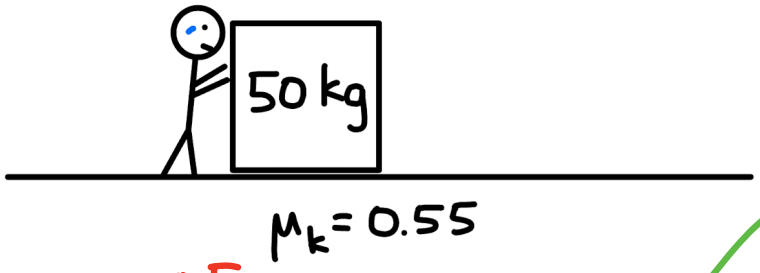
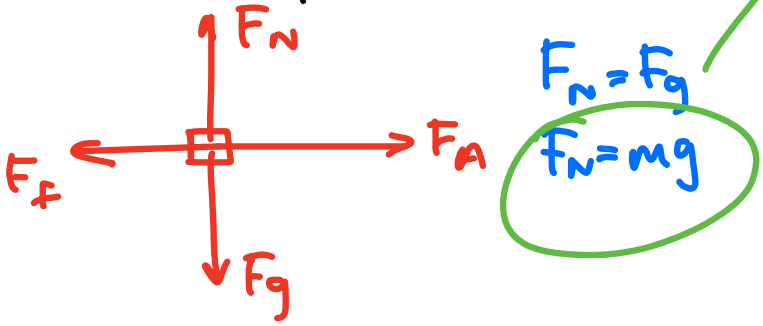


$\mu_k = 0.55$



$$F_{NET} = ma$$
$$F_A - F_f = ma$$
$$F_A - \mu F_N = ma$$
$$F_A - \mu mg = ma$$
$$a = \frac{F_A - \mu mg}{m}$$
$$= \frac{300 - (0.55)(50)(9.8)}{50}$$
$$= 0.61 \ \frac{m}{s^2} \quad \text{RIGHT}$$

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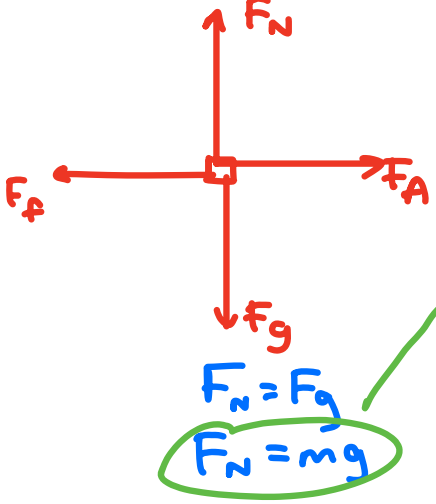
AT REST → USE μ_s



$$F_A = F_{f,MAX}$$
$$= \mu_s F_N$$
$$= \mu_s mg$$
$$= (0.70)(460)(9.8)$$

MINIMUM REQUIRED F_A

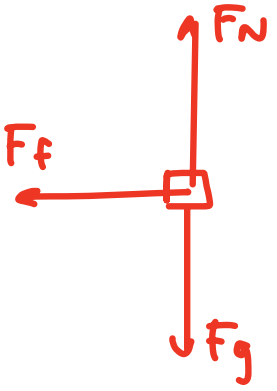
$$= 3156 \text{ N} > 2600 \text{ N} \rightarrow \text{NOT ENOUGH FORCE}$$

$$3156 \text{ N} - 2600 \text{ N} = 556 \text{ N}$$

NO, 556 N ADDITIONAL FORCE REQUIRED

An object is sliding with an initial velocity of 10 m/s across a rough surface (μ_k = 0.70). How much time will it take for the object to come to rest?

$\mu_k = 0.70$



$F_N = F_g$

$F_N = mg$

$F_{net} = ma$

$-F_f = ma$

$-\mu F_N = ma$

$-\mu mg = ma$

$a = -\mu g$

$= -(0.70)(9.8)$

$= -6.86 \frac{m}{s^2}$

$v_i = 10 \frac{m}{s}$

$v_f = 0$

$a = -6.86 \frac{m}{s^2}$

$t = ?$

$v_f = v_i + at$

$t = \frac{-v_i}{a} = \frac{-10}{-6.86} = \boxed{1.46 s}$