



Flipping Physics Lecture Notes: Understanding the Force of Friction Equation

$F_f = \mu F_N$

The force of friction equals the coefficient of friction times the force normal.

Kinetic Friction: $F_{kf} = \mu_k F_N$

Static Friction: $F_{sf} \leq \mu_s F_N$ & $F_{sf_{max}} = \mu_s F_N$

Static friction example Free Body Diagram:

- The force of static friction is to the left because if there were no friction, the book would slide to the right, so the force of static friction is preventing the book from sliding to the right.
- $\sum F_x = F_a - F_{sf} = ma_x = m(0) = 0 \Rightarrow F_a = F_{sf}$
- The force of static friction increase or decreases in an attempt to prevent the object from moving and, in this case, once the magnitude of the force applied exceeds the maximum magnitude of the force of static friction, the book starts to move and the friction switches to kinetic friction.

