
Week 11



TAM 210/211 Introduction of Statics

DISCUSSION SESSION



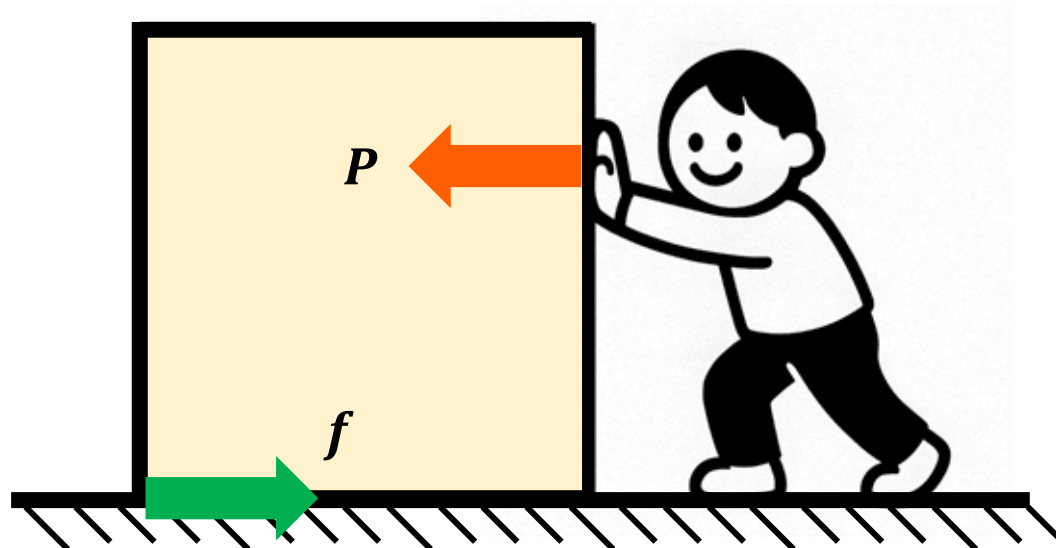
WEEK 11 – Friction

- **What if there was no friction for 1 minute?** (Reference: <https://www.youtube.com/watch?v=8dHmLdjC0oc>)



WEEK 11 – Friction

- **What is friction (= dry friction or Coulomb friction)?**
 - Appears between two solid surfaces in contact
 - Always acts in a direction to resist relative motion
 - Distributed over the contact area (→ simplified as a single concentrated force)



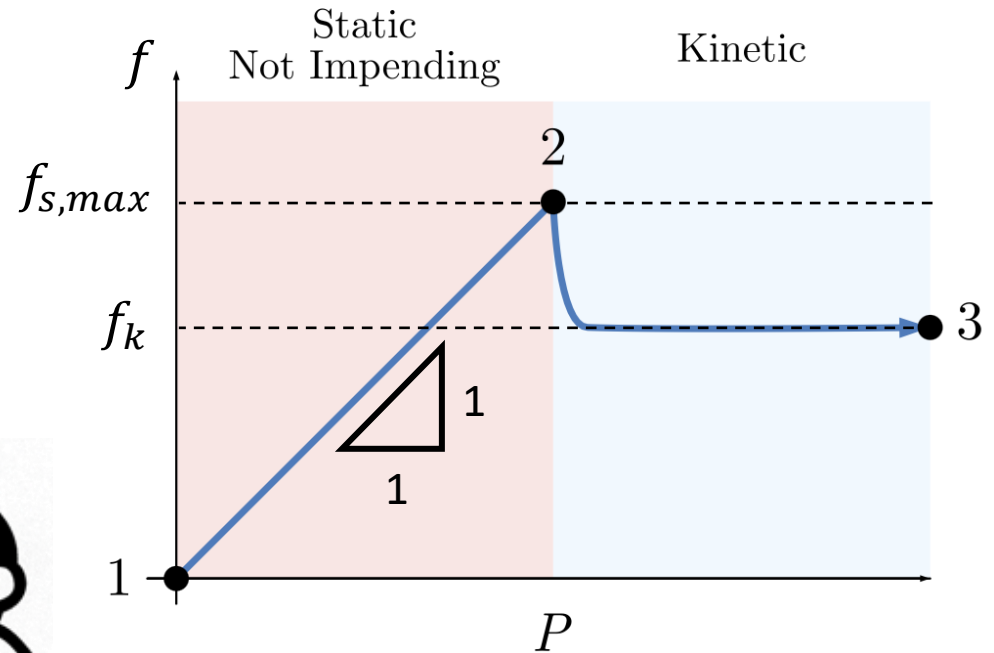
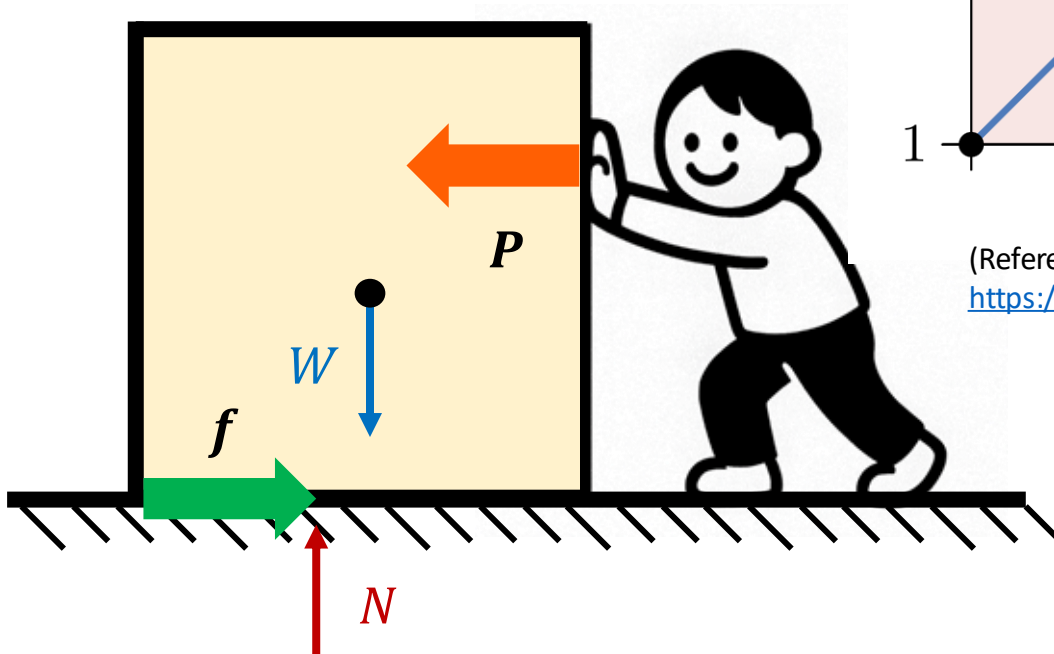
WEEK 11 – Friction

- **Static friction, f_s (region 1 – 2)**

- $f_s = P$ ($F < f_{s,max}$)
- $f_{s,max} = \mu_s N$ (point 2)

- **Kinetic friction, f_k (region 2 – 3)**

- $f_k = \mu_k N$ ($F > f_{s,max}$)



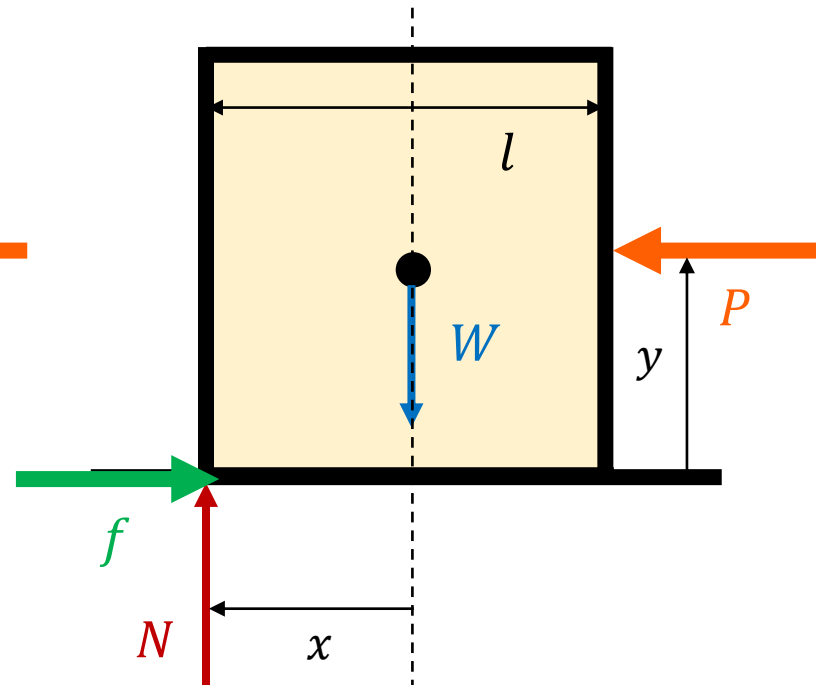
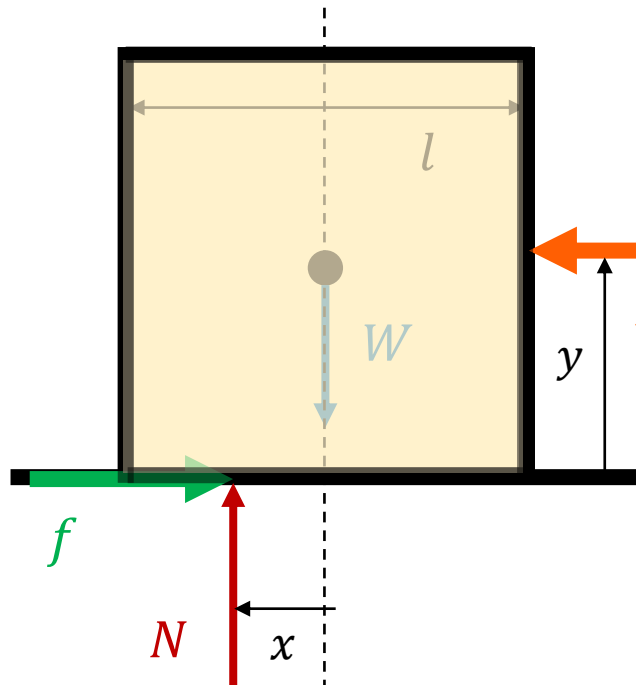
(Reference: online textbook

https://engineeringstatics.org/Chapter_09-dry-friction.html)

WEEK 11 – Friction

- **Slipping vs. tipping**

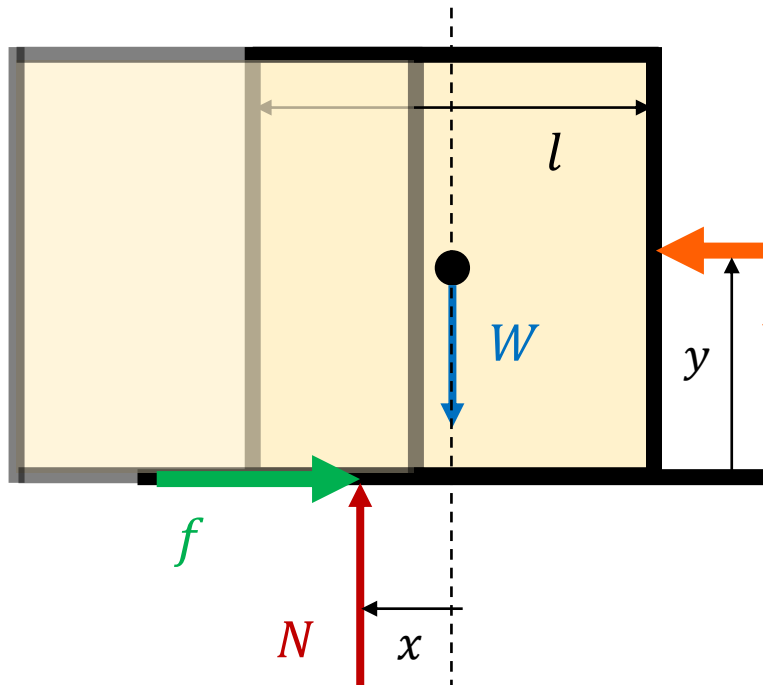
- The application point of the normal force causes the object to be tipped or slipped
- Slipping: $0 < x < \frac{l}{2}$
- Tipping: $x = \frac{l}{2}$



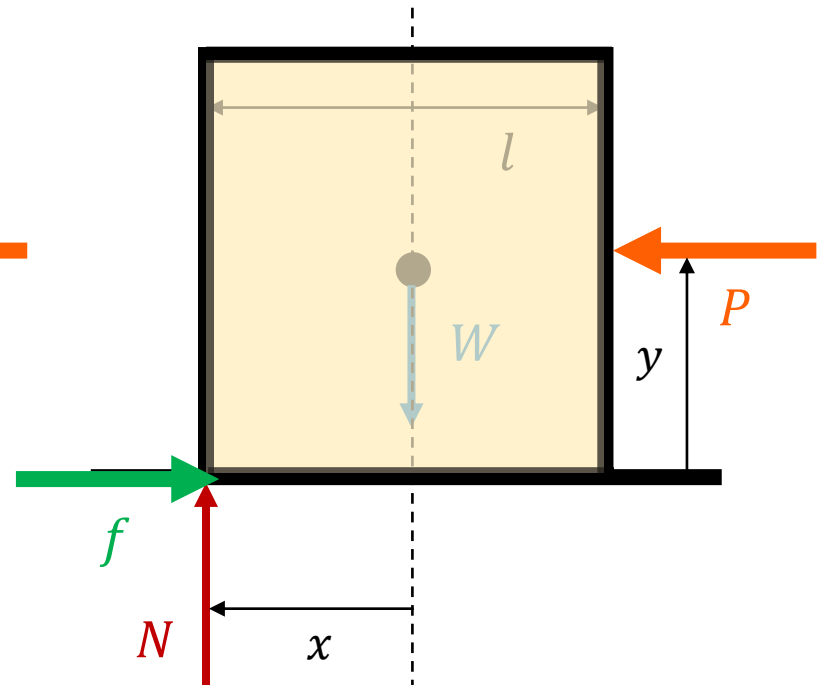
WEEK 11 – Friction

- **Slipping vs. tipping**

- The application point of the normal force causes the object to be tipped or slipped
- Slipping: $0 < x < \frac{l}{2}$
- Tipping: $x = \frac{l}{2}$



slipping



tipping

WEEK 11 – Friction

- **Slipping vs. tipping**

- The application point of the normal force causes the object to be tipped or slipped
- Slipping: $0 < x < \frac{l}{2}$
- Tipping: $x = \frac{l}{2}$

