Announcements

- No quiz next week ☺
- Have you been on Piazza lately?

❑ Upcoming deadlines:

- Thursday (9/21)
  - ME HW7
- Friday (9/22)
  - Writing Assignment 1 (FBD only)
- Tuesday (9/26)
  - PL HW8

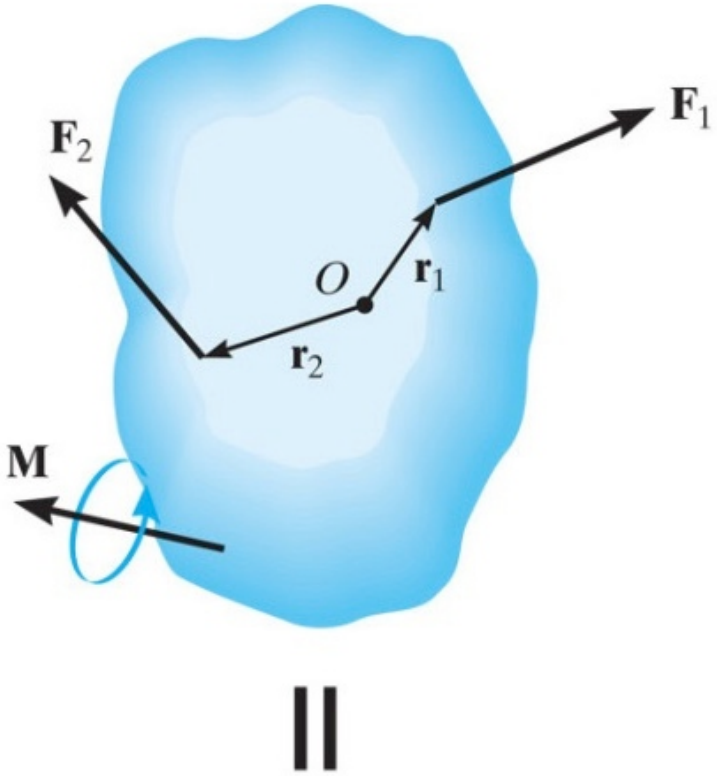
Recap

- Moment of a force
  - About a point
  - About an axis
  - Couple moment

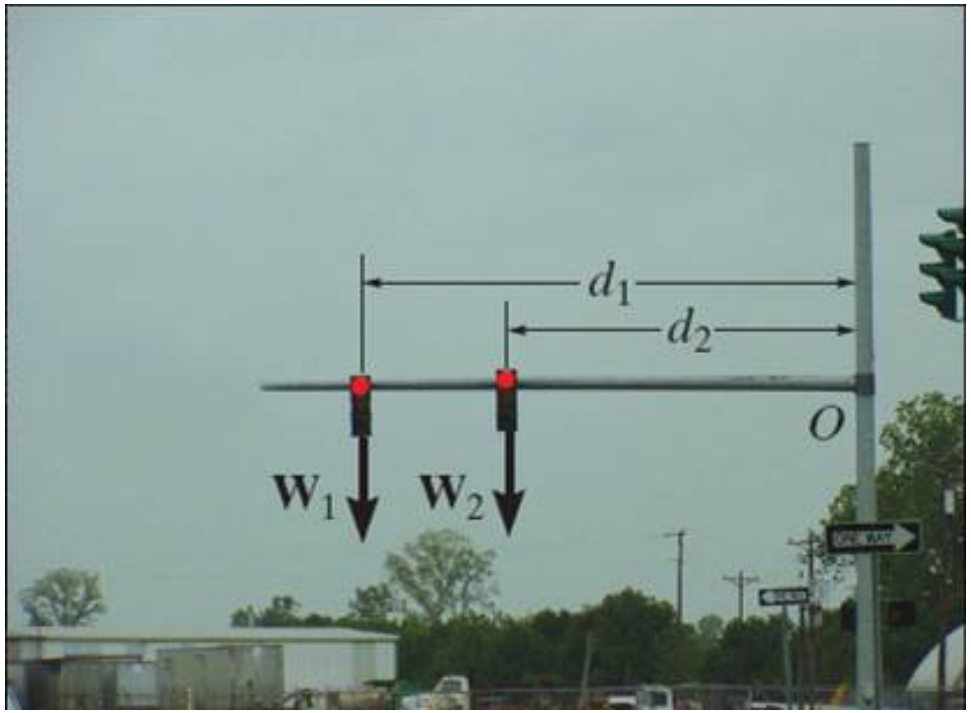
Equipollent (or equivalent) force systems

A force **system** is a collection of **forces** and **couples** applied to a body.

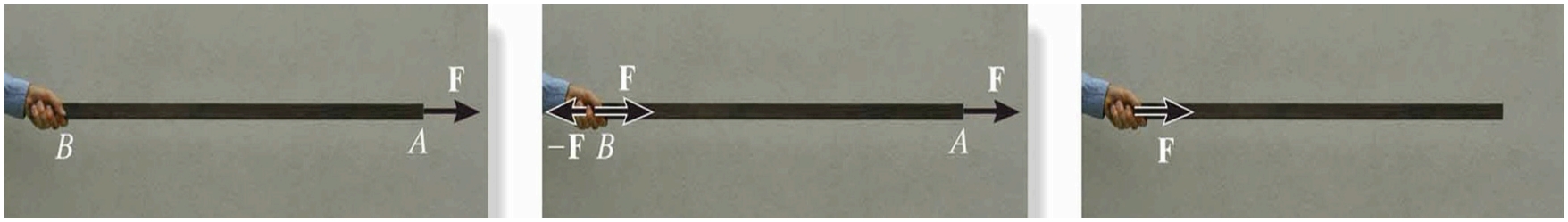
Two force systems are said to be **equipollent** (or equivalent) if they have the **same resultant force** AND the **same resultant moment** with respect to any point *P*.



What is the equivalent system?



Moving a force on its line of action

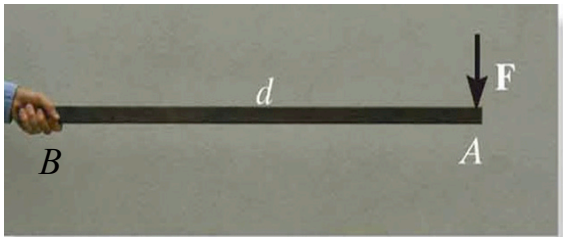


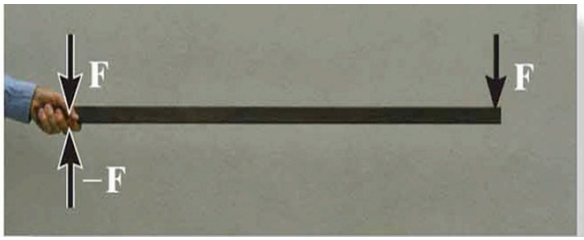
Moving a force from A to B, when both points are on the vector's line of action, does not change the **external effect**.

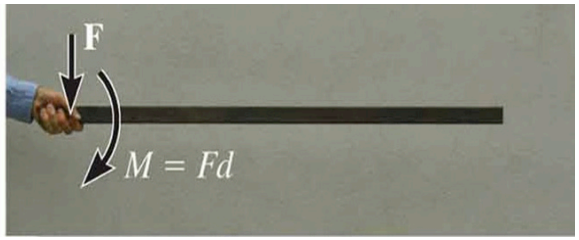
Hence, a force vector is called a **sliding vector**.

However, the **internal effect** of the force on the body does depend on where the force is applied.

Moving a force off of its line of action

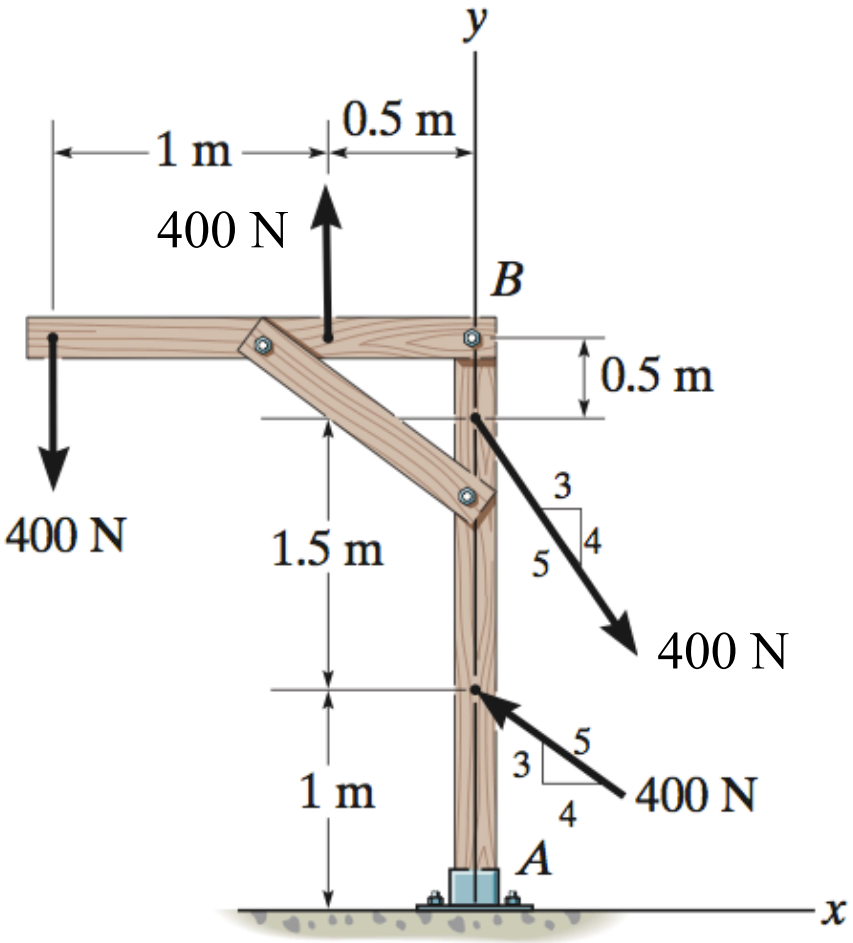






Example – 2D Equivalent System

Replace the loading on the frame by a single resultant force. Specify where its line of action intersects a vertical line along member *AB*, measured from *A*.



Example – 3D Equivalent System

Find the equivalent resultant force and couple moment at point *O* as the the two wrenches and the force acting on the pipe assembly below.