

MECHANISM AKA MECHANICAL SYSTEM

- used to change one kind of motion into another
- simplifies tasks → makes use of effort more effectively.

MOTION

one direction	1. Linear	→	Straight line
	2. Rotary	↻	gears
two direction	3. Oscillating	↔	eg. metronome, pendulum
	4. Reciprocating	↔	up & down / back & forth

Mechanism (process) → transfer / convert / control motion

CONTROL SYSTEM → smtg made up of parts/elements/obj to form a whole.

- allows some of its parts to be controlled for a specific purpose.

1. open loop control system:

Input → process → output

eg. User set timing of toaster → toaster heats up bread according to set time → toasted bread

2. closed loop control system

Input → process → output
↑ feedback ↓

CABLE CONTROL

+ve

- flexible
- take up less space as compared to rods/levers
- lighter as compared to rods/levers

-ve

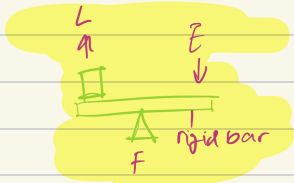
- flexibility → less applicable where precision required
- produce only tension forces, cannot push load

MECHANISM

LEVERS

[Pivot]
- fulcrum, effort, load
F E L

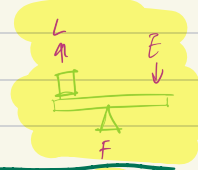
used to move



Classes (FLE)

1st class

F



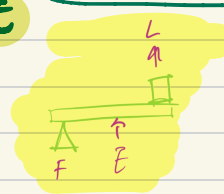
2nd class

L



3rd class

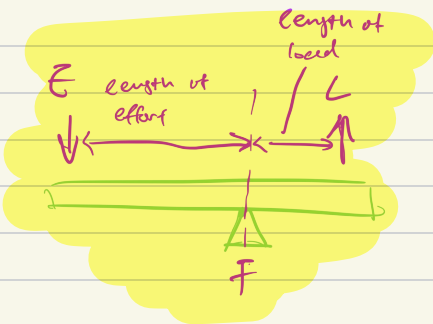
E



Mechanical Advantage (MA)

$$MA = \frac{\text{Length of Effort arm}}{\text{Length of Load arm}} = \frac{\text{Load (output)}}{\text{Effort (input)}}$$

When length of effort $\uparrow$, MA $\uparrow$



Moment (Turning force)

$$\text{Moment} = \text{force} \times \text{dist from fulcrum}$$

Velocity Ratio (VR)

$$VR = \frac{\text{dist moved by Effort}}{\text{dist moved by Load}}$$

$$MA > 1 = \text{Effort} < \text{Load} \quad \checkmark \checkmark$$

$$MA < 1 = \text{Effort} > \text{Load} \quad \times \times$$