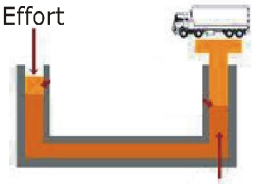
Class-VII(CANCEPT MAP)

SIMPLE MACHINES

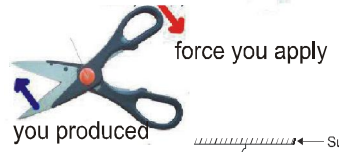
A simple machine is a device which by applying a small force at a convenient point in a desired direction can overcome a large resistance at another point.

Functions of a machine

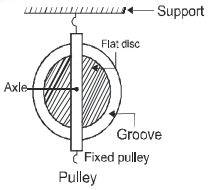
- Force multiplier — E.g. hydraulic jack



- Speed multiplier — E.g. scissor



- To change the direction of effort applied — E.g. pulley



Important terms

- Work input (W_i): The energy supplied to a machine.
- Work output (W_o): The useful workdone by the machine.
- Load : A resistive force to be overcome by a machine.
- Effort : An external force applied to a simplemachine to overcome the load.
- Velocity of the effort (V): Distance travelled by the effort in unit time.
- Velocity of the load (V): Distance travelled by the load in unit time

$n = \frac{W_o}{W_i}$

$MA = \frac{L}{E}$

$VR = \frac{V_e}{V_l}$

$n = \frac{MA}{VR}$

Kinds of simple machines

- Levers : A straight rigid bar capable of turning around a fixed point
  - Categories
    - 1st class — See-saw

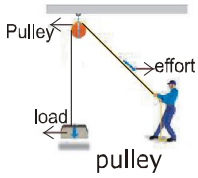
    - 2nd class — wheel barrow

    - 3rd class — racket

- Inclined plane : A smooth, rigid flat surface, inclined at an angle to the horizontal plane

inclined plane

- Modified forms
  - Pulley — pulley



  - Wheel and axle

  - Wedge — knife

  - Screw — screw