Force and Motion - II

* a frictional force is the vector sum of many forces acting between the surface atomes of one body of those of another body and

- **Friction**
  - **Kinetic friction**: Resistive force $\Rightarrow f_k$
    - → opposite to the Motion
    - $f_k = \mu_k F_N$ — μ_k: coefficient of Kinatic Frict; F_N: Normal force
  - **static friction**: $f_{s,max} = \mu_s F_N$ — μ_s: Coefficient of static friction
    - It's a Resistive force
    - It's direction and It's strength Can change

* an object moves when the strength that pushing is greater then the Maximum of static friction $f_{s,max}$

* usually, $|f_k| < |f_{s,max}|$

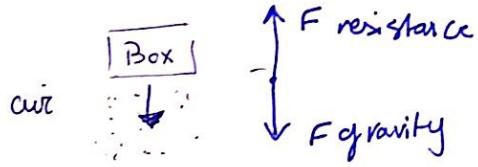
* f_s and f_k is always parallel to the surface and opposed to the attempted sliding

friction is independant of surface area and velocity

- **Drag force** - Resistive force $\vec{D}$

* when objects move via fluids (liquids and gases) the Molecule create a resistance force known as Drag force

- depends on velocity of object



$$D = \frac{1}{2} C \rho A V^2$$

C:- The drag coefficient
ρ: the air density
A: effective cross-sectional area of the body
V: velocity

$$mg = \frac{1}{2} C \rho A V_t^2$$

(if $D = mg \Rightarrow a = 0 \Rightarrow$ the body falls at a constant speed called

- Terminal speed

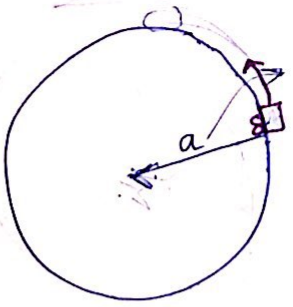
Haa Ataiwi

- **Uniform circular Motion**

$F = \frac{mv^2}{R}$ (a)

- speed is constants
- |a| is constant and F is Constant too

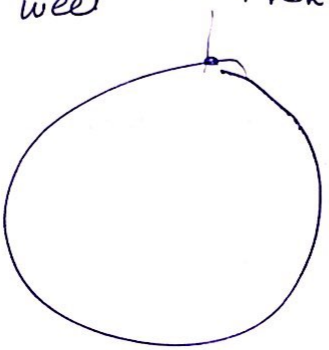
* Directions of a and F are changing



centripetal acceler-- ⇒ caused by Centripetal Force which is :- frictional force

- When $F_{centripetal}$ is bigger than f Then it slides off to the outside of the curve

- ..If a peros is strapped into their seat belt on a ferris weel Then at the Top



$F_{belt\ up} = 0$

$F_{belt\ down} = 0$

$F_g = mg$

$F = ma$

$F_g = m(g)$

Alaa Hamini