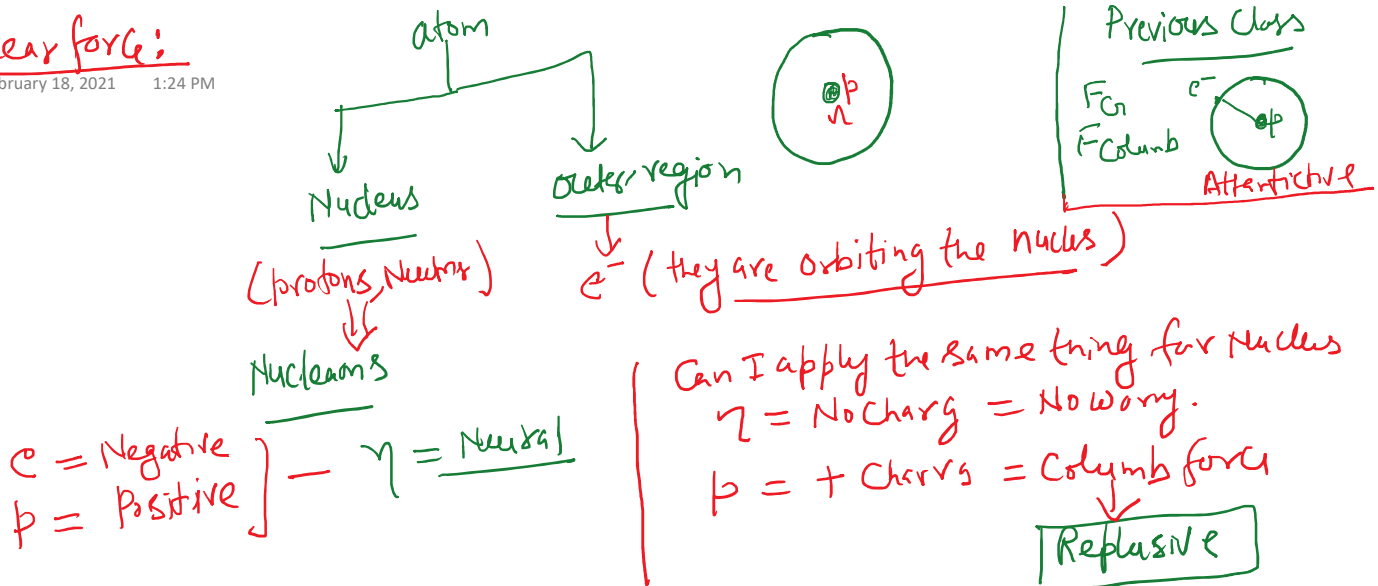


Nuclear force:

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Then, How protons can stay in such a small area (i.e. nucleus)?
(1) There is a strong nuclear force that works on nucleons and overcome to the Coulomb repulsive force

→ Strong Nuclear force is a short range force. We measured the size of nucleus in fm. $1 \text{ fm} = 10^{-15} \text{ m}$

Size Of Nucleus: — $r = r_0 A^{1/3}$ — Here $A = \text{Atomic mass}$
 $r_0 = 1.2 \text{ fm}$

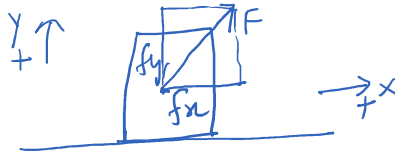
⇒ Do you think the nuclear force is always attractive?

(*) Weak Nuclear force: — Another kind of force, that is encountered when reactions are involving protons, electrons and neutrons.

$\beta^- \text{ decay} \Rightarrow n \rightarrow p + \text{antineutrino}$
 $\beta^- \text{ decay} \Rightarrow p \rightarrow n + \text{neutrino}$

Friction:—

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(i) Perpendicular Component $(F_y) = N$

(ii) Parallel Component $(F_x) = f$

The parallel Component of the Contact force is known as friction.

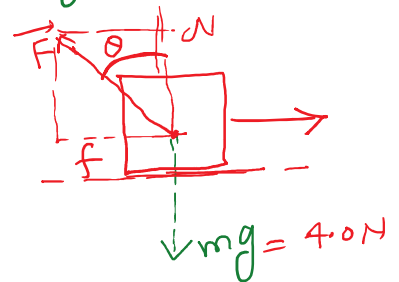
Ex.

$m = 400 \text{ grams}$. This body is sliding on a smooth surface.

$f = 3.0 \text{ N}$

(a) angle made by the Contact force on the body with the vertical.

(b) Magnitude of the Contact force.



$$mg = (0.400 \text{ kg}) \times 10 = 4.0 \text{ N}$$

$$\Rightarrow N = mg = 4.0 \text{ N}$$

$$\tan \theta = \frac{f}{N} = \frac{3}{4} \Rightarrow \theta = \tan^{-1}\left(\frac{3}{4}\right) = 37^\circ$$

$$\Rightarrow \text{Magnitude } F_m = \sqrt{f^2 + N^2} = \sqrt{3^2 + 4^2} = 5.0 \text{ N}$$

Types of the friction: There are two types of the friction.

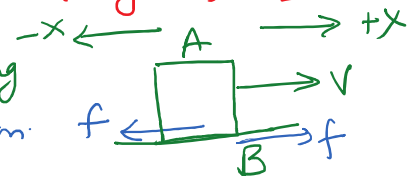
(i) Kinetic friction (ii) Static friction

(i) Kinetic friction:— When two bodies in contact move with respect to each other, rubbing the surface, the friction between them is known as kinetic friction.

The direction of the frictional forces are such that the relative slipping is opposed by the friction.

(i) direction of friction force working on the body A = -x direction

(ii) direction of friction force working on the body B =



Direction of the friction

f direction on box because of the blocks =



(ii) Magnitude →

