29/09/2020

Introduzione:

Forze:

- forza elastica
- attrito
- forza pressione
- forza di gravità
- forza elettrica

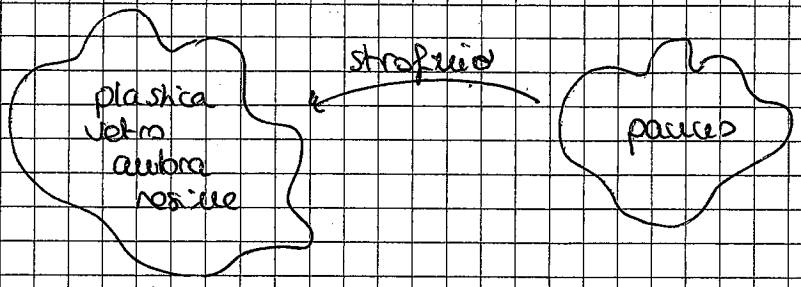
→ contatto

→ azione a distanza

Forza elettrica:

Processi di elettrizzazione:

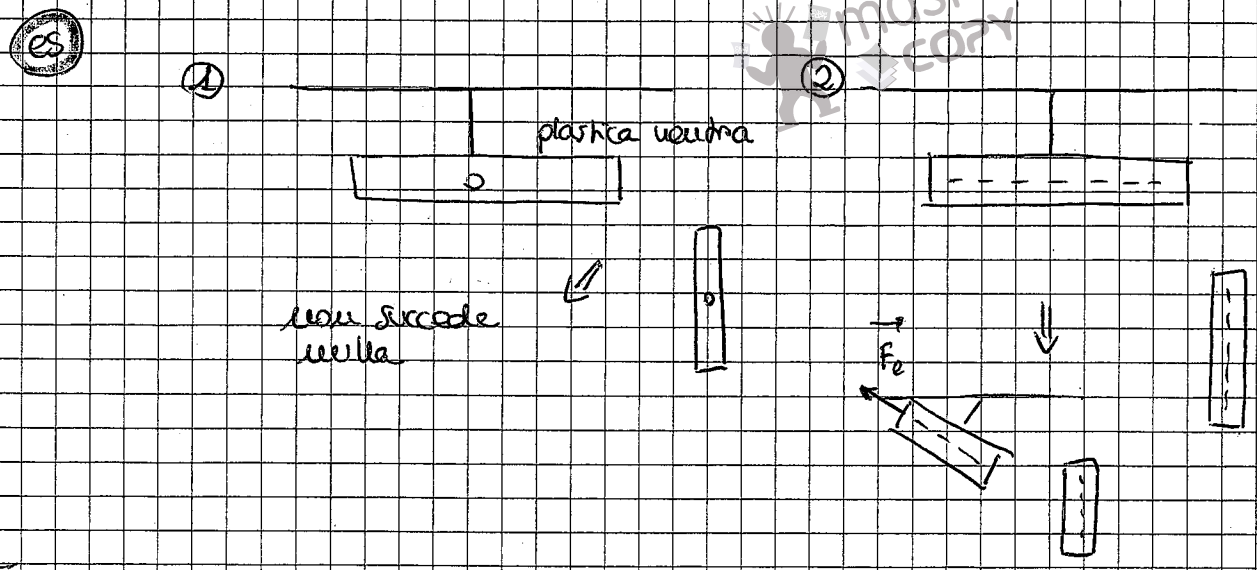
1. strofinamento:



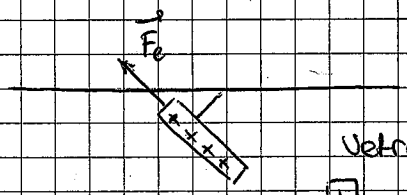
⇓

da soli ripicchiando vetro

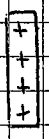
es



③



vetro

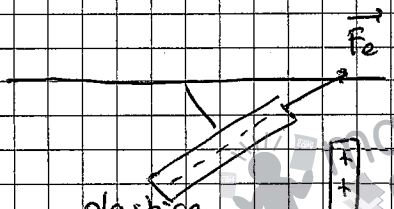


- plastica

+ vetro

forza repulsiva

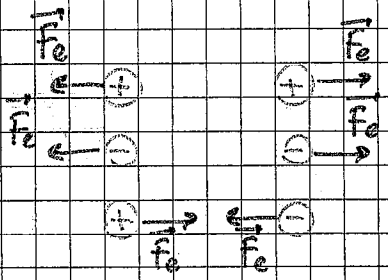
④



forza attrattiva

plastica

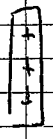
vetro



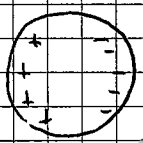


mylar

metallo neutro

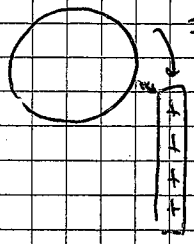


isolante caricato x strofinamento

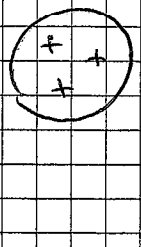




quando sono vicini addensamento di cariche con segno opposto sulla faccia della sfera

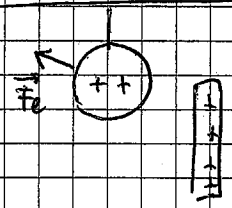


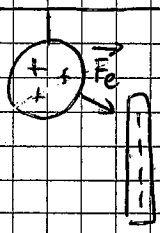
⇒ Con il contatto sfuggono delle cariche elettriche

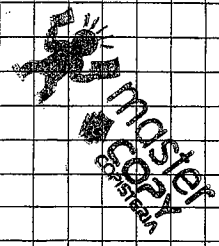


⇒ carica elettrica complessiva diversa da zero

quindi ottengo carica positiva anche la sfera di nylon





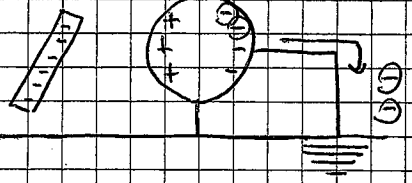


master copy

2. Induzione elettrostatica

es

sfera conduttrice



il collegamento a terra apre una via di fuga alle cariche elettriche

master copy

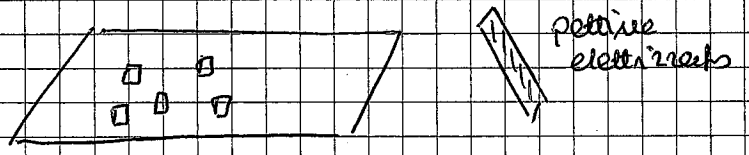
⇓

quindi le cariche con segno ⊕ si allontanano sempre di più

fino a che non ladio il filo e la sfera si ritrova con carica elettrica netta diversa da 0

polarizzazione (isolanti)

es.



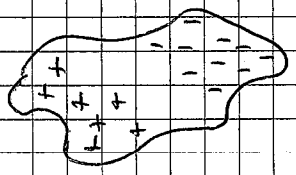
⇓

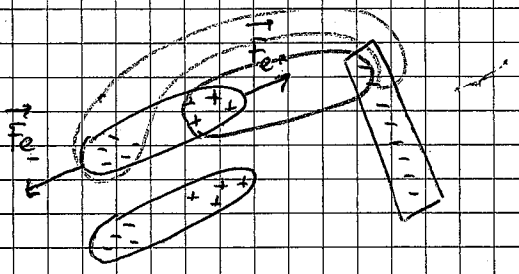
> quando si avvicina ai pezzetti di carta questi sono attratti dal pettine elettrizzato

molte molecole sono neutre ma polarizzate

↓

la distribuzione di cariche elettriche non è uniforme

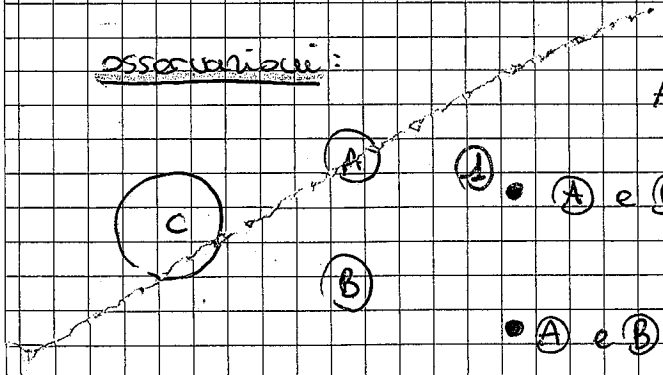




> l'intensità della forza elettrica dipende anche dalla distanza delle cariche elettriche
>
> $\vec{F_e} + \vec{F_e} \neq 0$

→ <u>dove sono le cariche elettriche?</u>

<u>ossservazioni:</u>



A e B possono essere materiali diversi

1. • A e B sono attratti da C → A e B si <u>respingono</u>
   • A e B si respingono da C ↗

(2) • (A) è attratto da (C) e (B) è respinto da (C) → (A) e (B) si allontanano

• (A) è respinto da (C) e (B) è attratto da (C) →

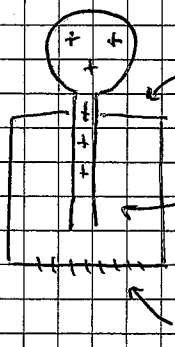
↓

- le cariche sono di due segni
- cariche concordi si respingono e discordi si attraggono

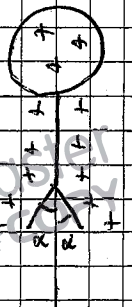
→ costituenti elementari della materia:

- protoni $m_p = 1{,}6725 \cdot 10^{-27}$ kg (+)
- neutroni $m_n = 1{,}6748 \cdot 10^{-27}$ kg (0)
- elettroni $m_e = 9{,}109 \cdot 10^{-31}$ kg (−)

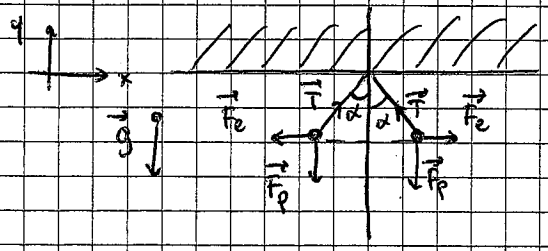
→ elettroscopio a foglie:



a seconda di quanto si spostano varia la carica elettrica



posso schematizzare le foglie con due pendolini



$$\vec{F_e} + \vec{F_p} + \vec{T} = 0$$

$$\begin{cases} -T\sin\alpha + F_e = 0 \\ T\cos\alpha - F_p = 0 \end{cases}$$