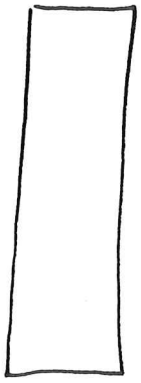
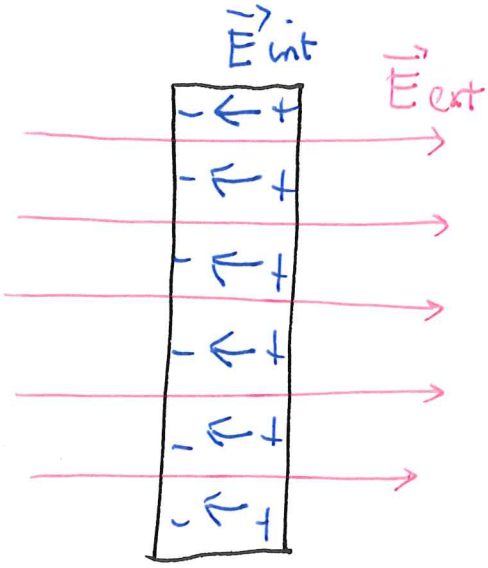
Conductor (neutral)



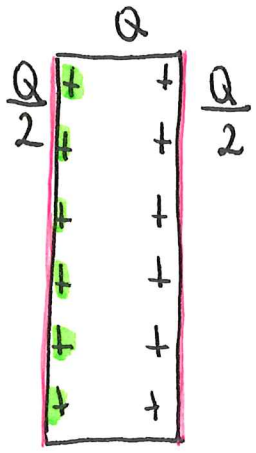
External electric field



$\vec{E}_{int}$ cancels $\vec{E}_{ext}$, so $\vec{E} = 0$ inside the conductor.

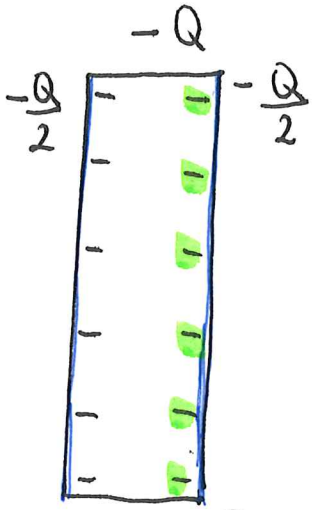
Surface density for conductors.

a) isolated conductor



$$\sigma = \frac{Q}{2L^2}$$

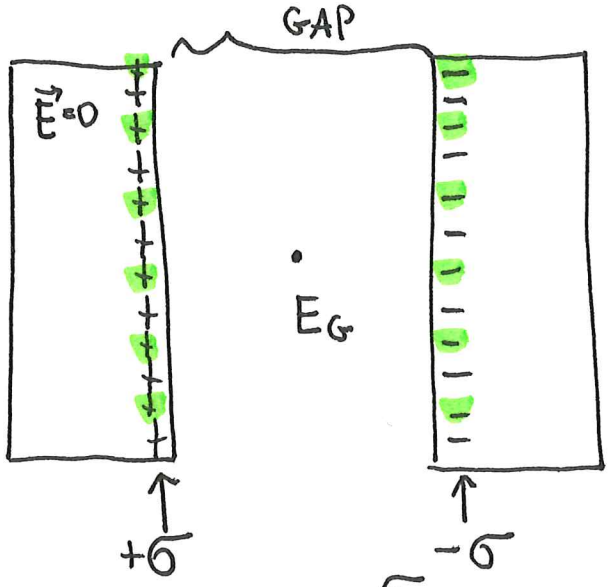
$$E = \frac{\sigma}{\varepsilon_0}$$



$$\sigma = \frac{-Q}{2L^2}$$

$$E = \frac{\sigma}{\varepsilon_0}$$

b) When we bring two conductors together → charges re-arrange (minimum energy requirement)
& $\vec{E} = 0$ inside each conductor.

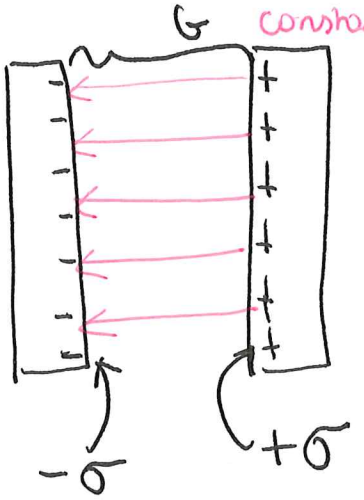


$$E_G = \frac{\sigma}{\varepsilon_0}$$

property of conductor

Here: $\sigma = \frac{Q}{L^2}$

sigma is defined differently here



$$|\sigma| = 7.48 \times 10^{-22}\ C/m^2$$

Outside → no E-field → cancel

$$E_G = \frac{\sigma}{\varepsilon_0}$$

$$E_G = \frac{7.48 \times 10^{-22}\ C/m^2}{8.85 \times 10^{-12}\ \frac{C^2}{N \cdot m^2}} = 0.845 \times 10^{-10}\ N/C$$

$$E_G = 8.45 \times 10^{-11}\ N/C$$