

Física III

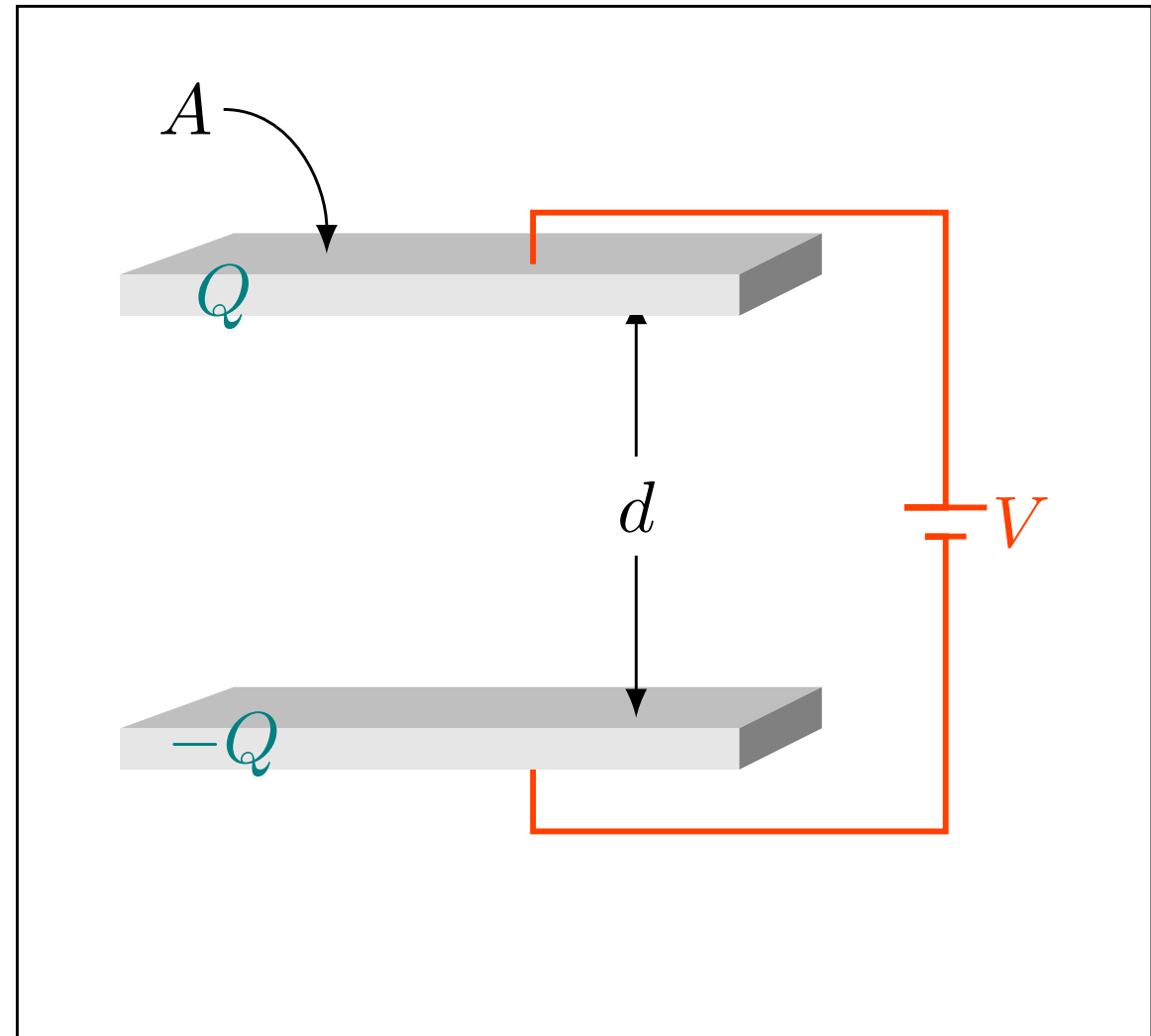
Aula online 11/05/2020

Dielétricos

Capacitor

$$Q = CV$$

$$C = \frac{\epsilon_0 A}{d}$$

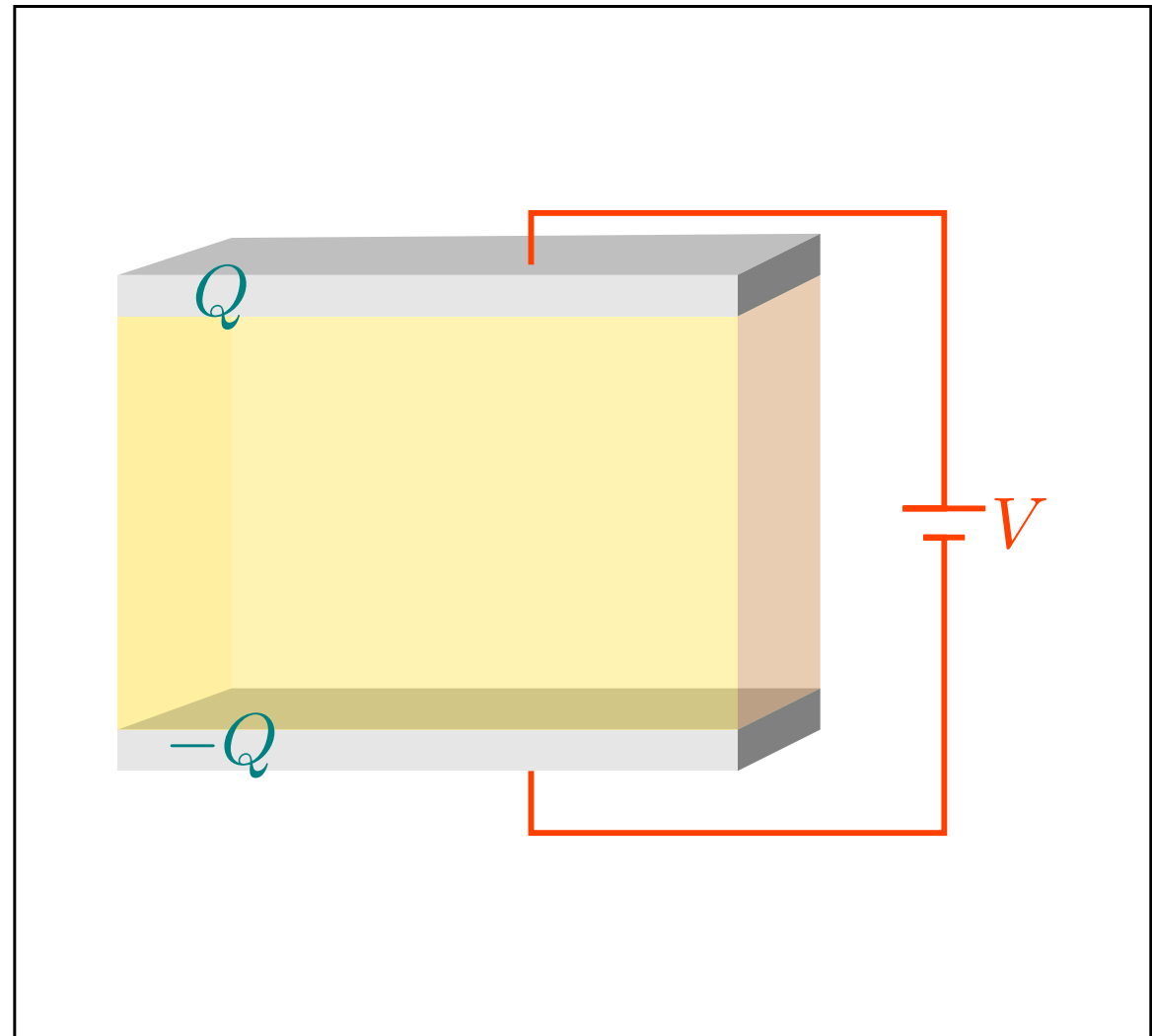


Capacitor mais dielétrico

$$Q = CV$$

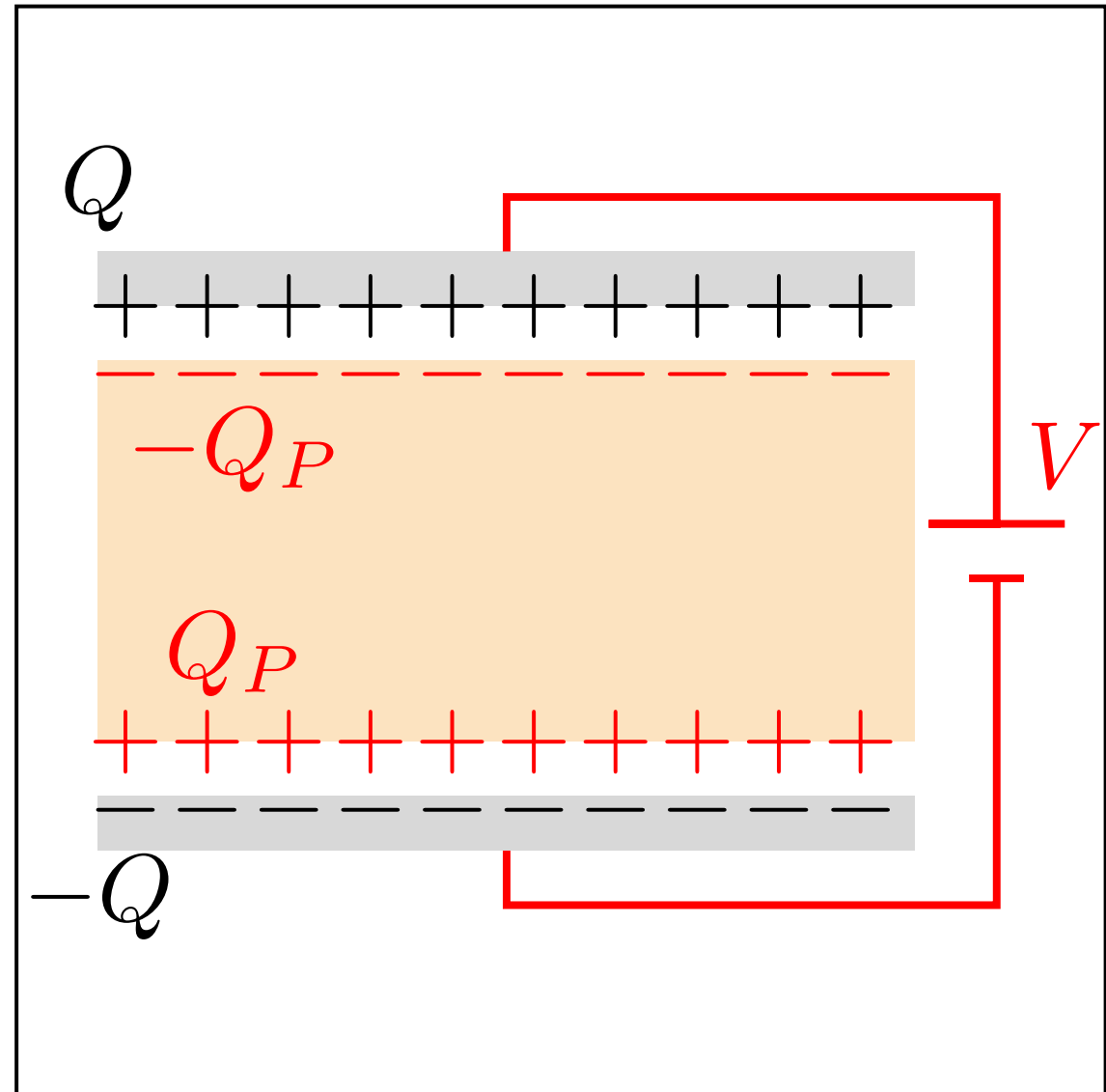
$$C = \kappa \epsilon_0 \frac{A}{d}$$

Material	K
Ar	1
Papel	3.5
Pyrex	5
Si	12
Etanol	25
Gelo	4
Água	80



Capacitor mais dielétrico

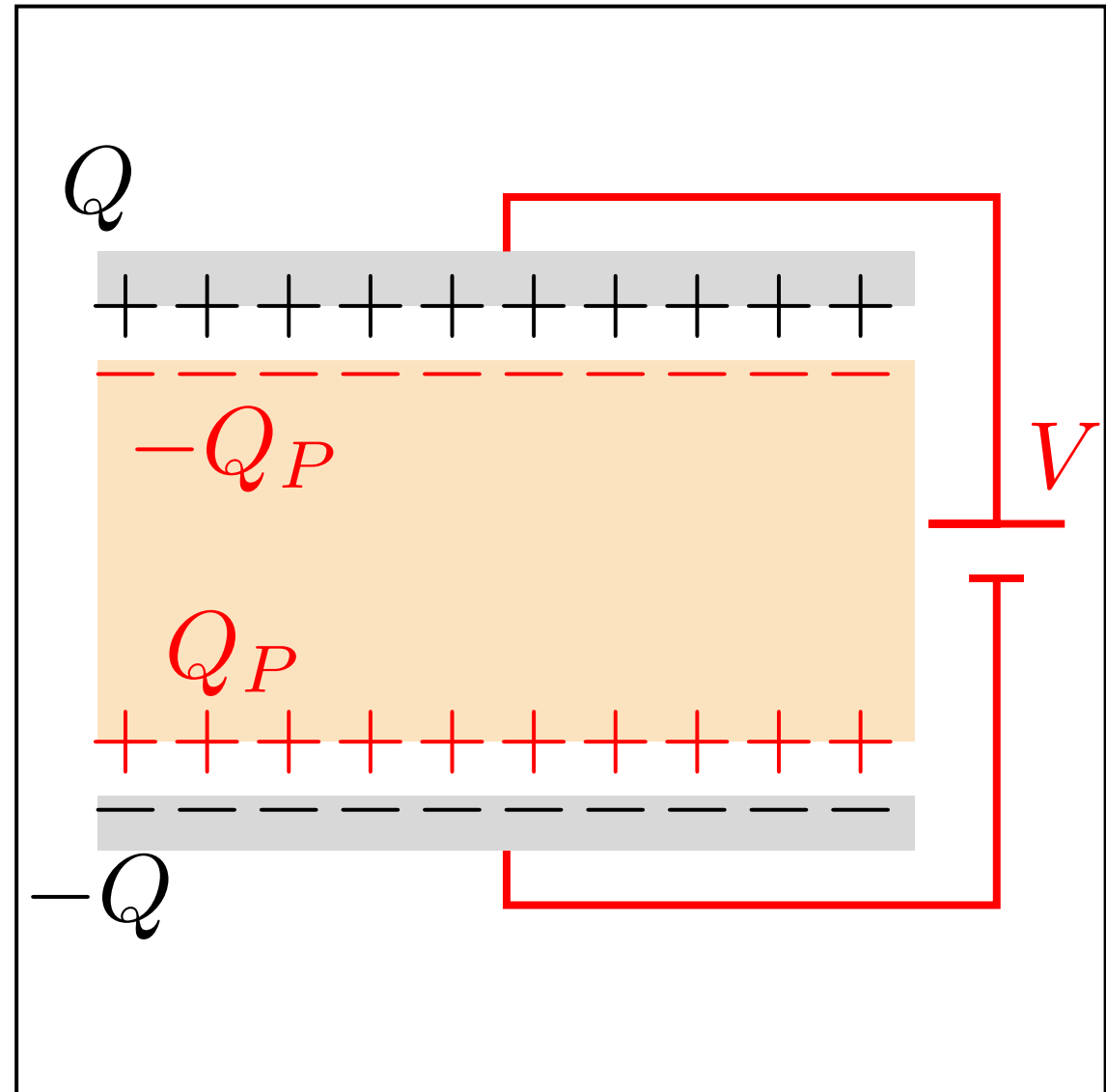
$$E = \frac{\sigma}{\epsilon_0}$$



Capacitor mais dielétrico

$$\cancel{E = \frac{\sigma}{\epsilon_0}}$$

$$E = \frac{\sigma - \sigma_P}{\epsilon_0}$$



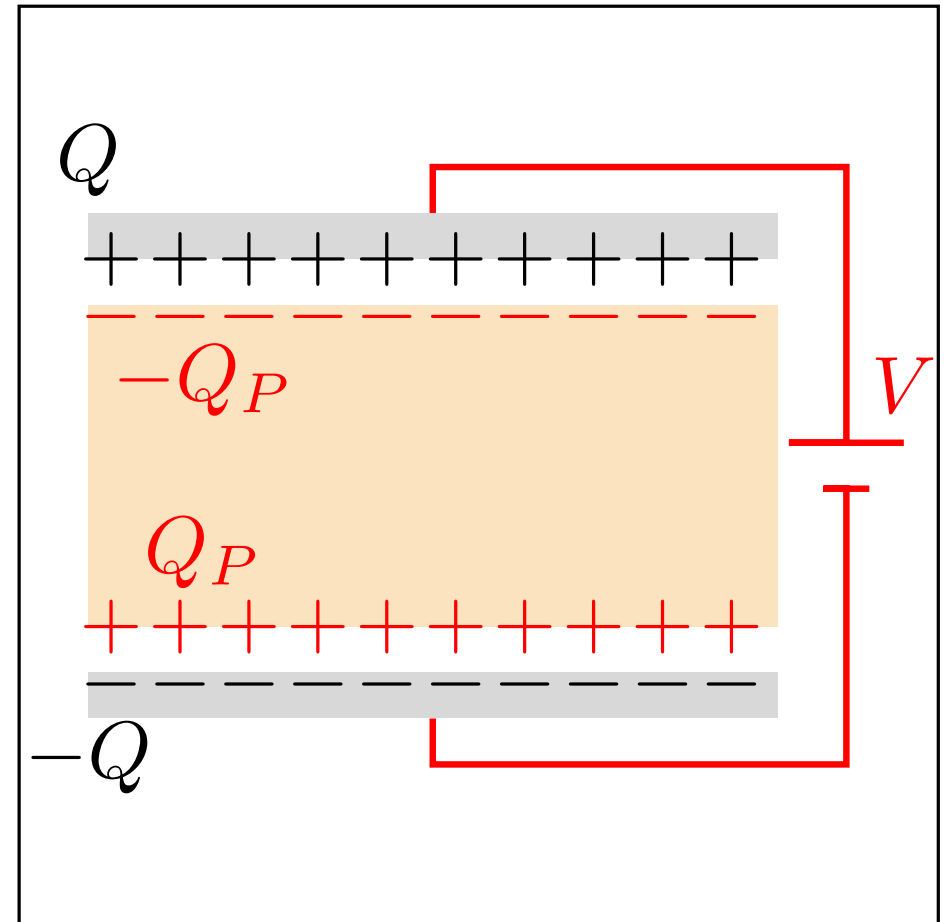
Capacitor mais dielétrico

$$E = \frac{\sigma - \sigma_P}{\epsilon_0}$$

$$E = \frac{Q - Q_P}{A\epsilon_0}$$

$$V = \frac{Q - Q_P}{A\epsilon_0}d$$

$$Q - Q_P = \frac{A\epsilon_0}{d}V$$



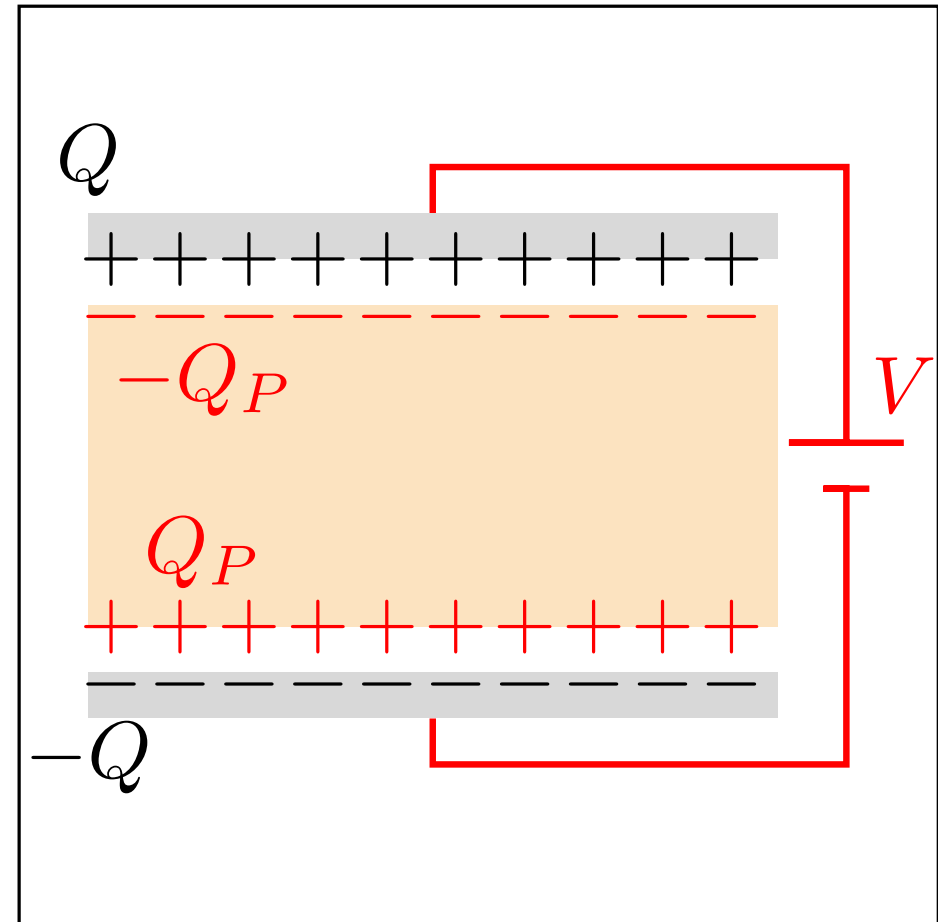
Capacitor mais dielétrico

$$E = \frac{\sigma - \sigma_P}{\epsilon_0}$$

$$E = \frac{Q - Q_P}{A\epsilon_0}$$

$$V = \frac{Q - Q_P}{A\epsilon_0} d$$

$$Q - Q_P = \frac{A\epsilon_0}{d} V$$



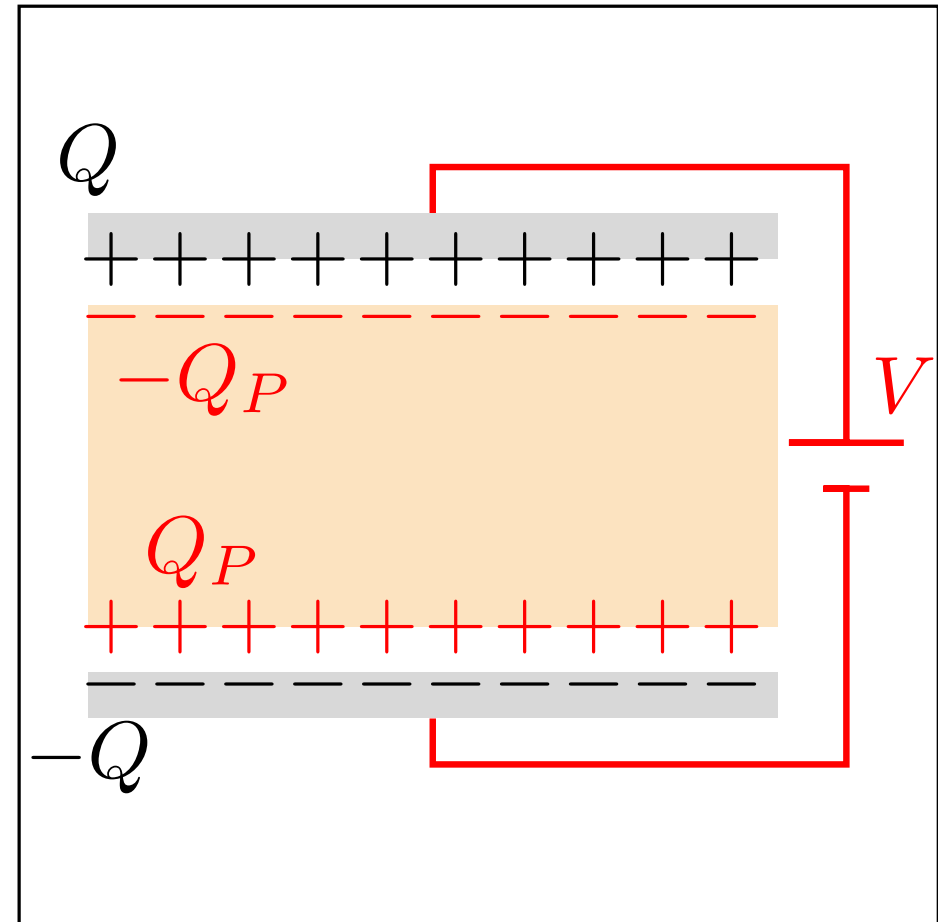
Capacitor mais dielétrico

$$Q - Q_P = \frac{A\epsilon_0}{d} V$$

$$C = \kappa \frac{A\epsilon_0}{d}$$

$$\frac{A\epsilon_0}{d} = \frac{C}{\kappa}$$

$$Q - Q_P = \frac{Q}{\kappa}$$



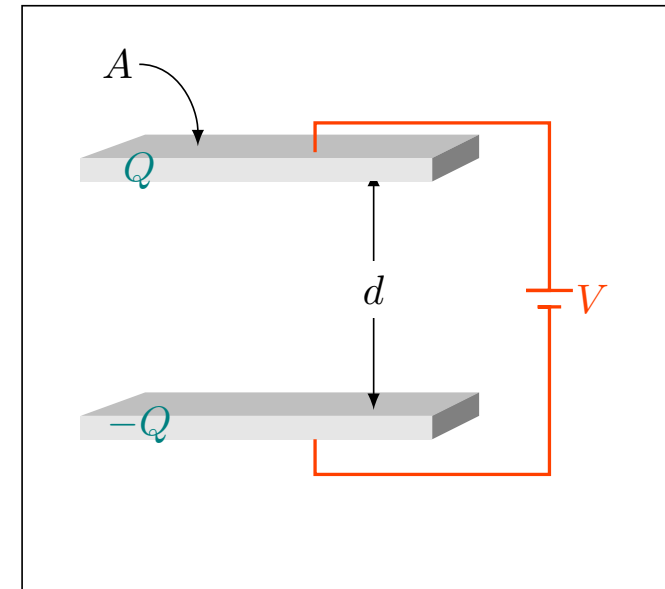
$$\Rightarrow Q_P = \frac{\kappa - 1}{\kappa} Q$$

Pratique o que aprendeu
Por que o dielétrico aumenta a
capacitância?

$$C_0 = 1\mu\text{F}$$

$$V = 1\text{V}$$

$$Q_0 = 1\mu\text{C}$$

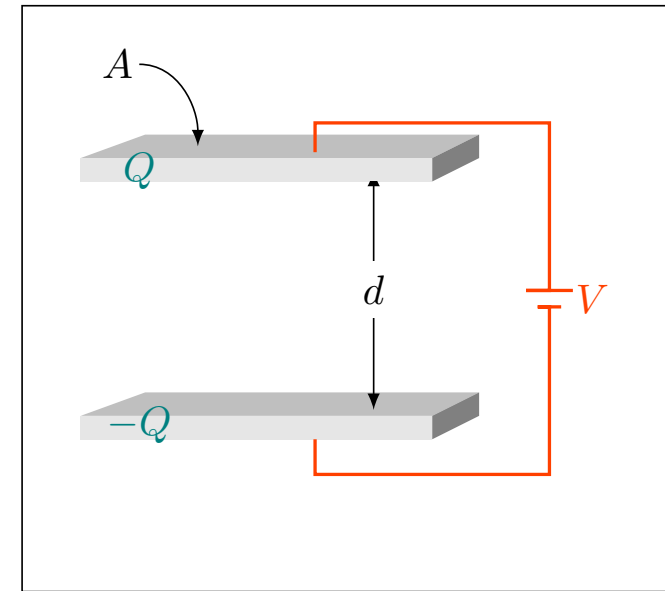


Pratique o que aprendeu
Por que o dielétrico aumenta a
capacitância?

$$C_0 = 1\mu\text{F}$$

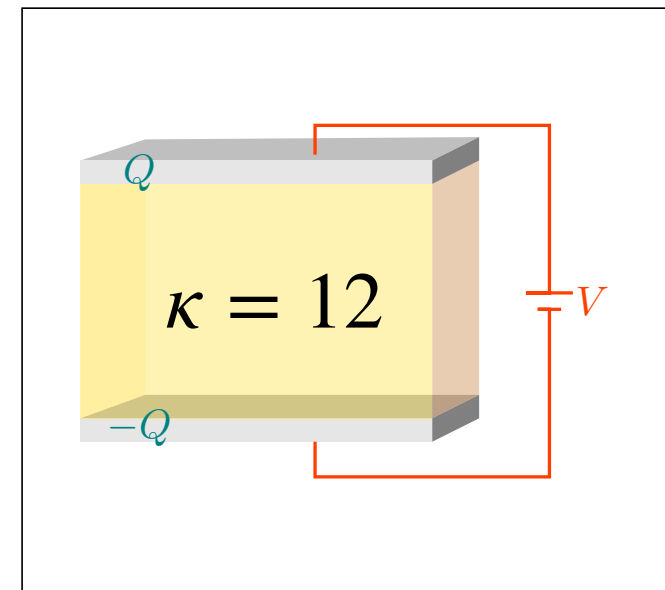
$$V = 1\text{V}$$

$$Q_0 = 1\mu\text{C}$$



$$C = 12\mu\text{F}$$

$$Q = 12\mu\text{C}$$



Pratique o que aprendeu
Por que o dielétrico aumenta a
capacitância?

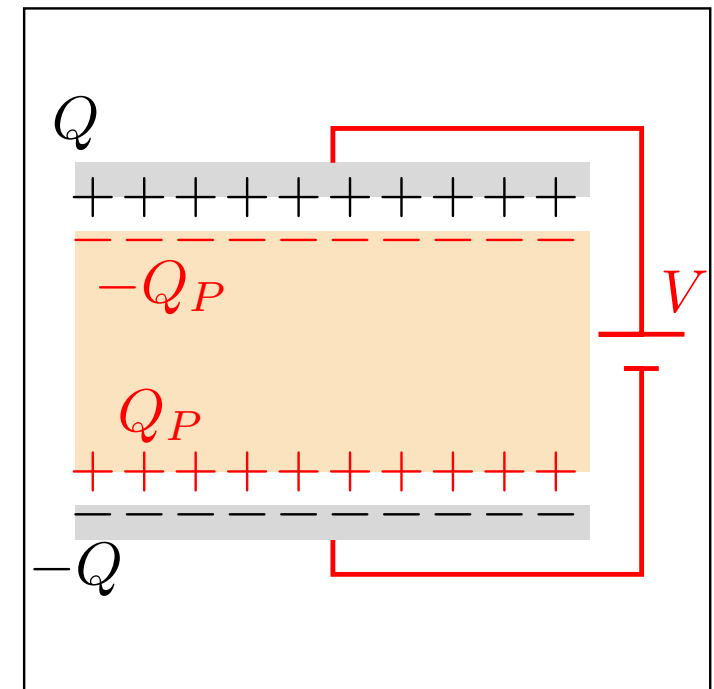
$$C_0 = 1\mu\text{F}$$

$$V = 1\text{V}$$

$$Q_0 = 1\mu\text{C}$$

$$C = 12\mu\text{F}$$

$$Q = 12\mu\text{C}$$



Pratique o que aprendeu
Por que o dielétrico aumenta a
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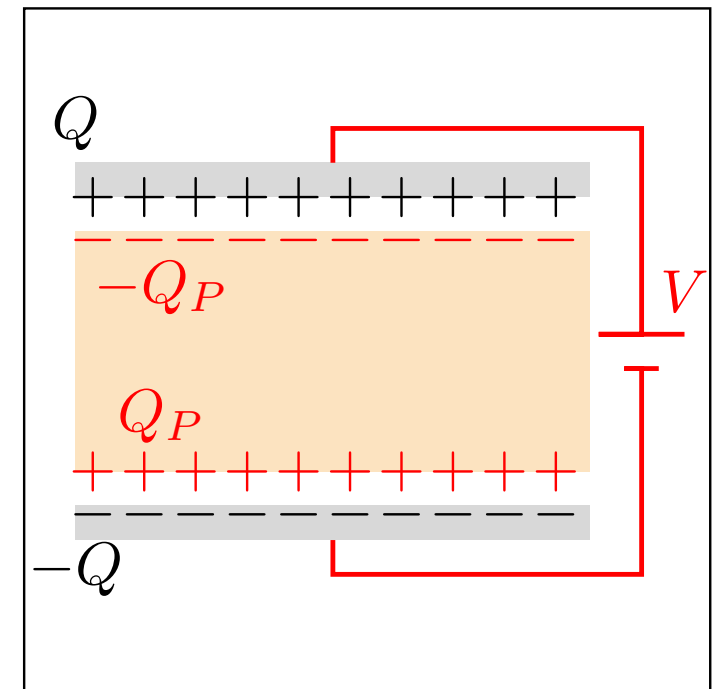
$$C_0 = 1\mu\text{F}$$

$$V = 1\text{V}$$

$$Q_0 = 1\mu\text{C}$$

$$C = 12\mu\text{F}$$

$$Q = 12\mu\text{C}$$



$$Q_P = \frac{\kappa - 1}{\kappa} Q$$

Pratique o que aprendeu
Por que o dielétrico aumenta a
capacitância?

$$C_0 = 1\mu\text{F}$$

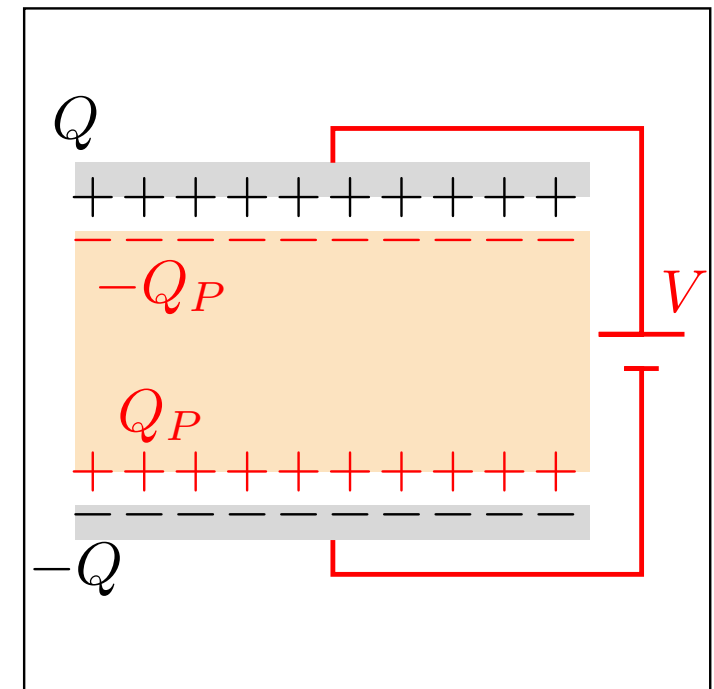
$$V = 1\text{V}$$

$$Q_0 = 1\mu\text{C}$$

$$C = 12\mu\text{F}$$

$$Q = 12\mu\text{C}$$

$$Q_P = 11\mu\text{C}$$



$$Q_P = \frac{\kappa - 1}{\kappa} Q$$