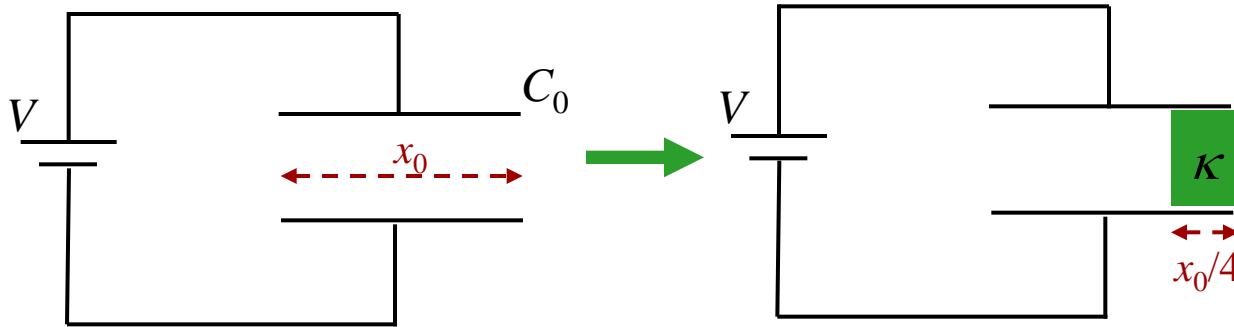


Calculation



An air-gap capacitor, having capacitance C_0 and width x_0 is connected to a battery of voltage V .

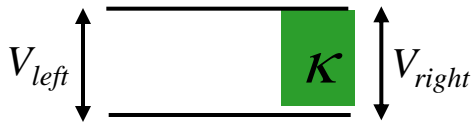
A dielectric (κ) of width $x_0/4$ is inserted into the gap as shown.

Strategic Analysis:

- Calculate new capacitance C
- Apply definition of capacitance to determine Q

What is Q_f , the final charge on the capacitor?

To calculate C , let's first look at:



A) $V_{left} < V_{right}$

B) $V_{left} = V_{right}$

C) $V_{left} > V_{right}$

The conducting plate is an equipotential !