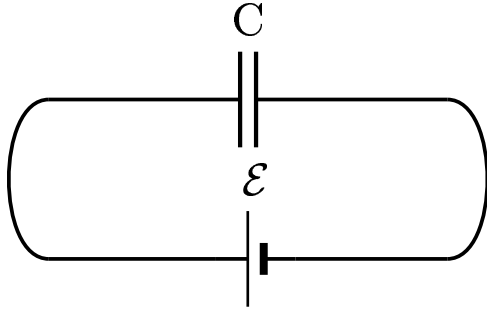


A Capacitor with capacitance C is connected to a battery with a voltage V . It has a plate charge Q and a total energy U . Fill the gap with material which has dielectric constant κ . The corresponding new quantities are Q' and U' .



Determine the ratio of charges $\frac{Q'}{Q}$.

- A) $\frac{Q'}{Q} = \kappa$
- B) $\frac{Q'}{Q} = 1$
- C) $\frac{Q'}{Q} = \frac{1}{\kappa}$

$$V' = \frac{Q'}{C'} = V = \frac{Q}{C}, \quad \text{or}$$

$$\frac{Q'}{Q} = \frac{C'}{C} = \kappa.$$

Answer **A**.

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