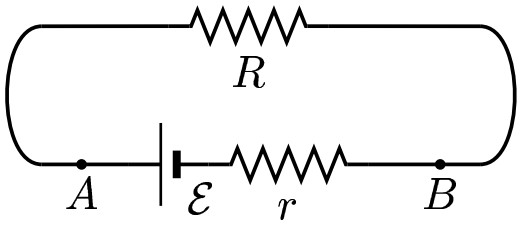
Given battery has *emf* $\mathcal{E} = 10$ V and the internal resistance $r = 1\,\Omega$, as shown in the figure below. An external resistance $R = 0.01\ \Omega$ is connected to the battery.



Compare V_{AB} with $\mathcal{E}$.

A) $V_{AB} \ll \mathcal{E}$.
B) $V_{AB} \approx \mathcal{E}$.
C) $V_{AB} \gg \mathcal{E}$.

$$R_{total} = R + r$$

$$I = \frac{\mathcal{E}}{R + r}$$

$$V_{AB} = \frac{R}{R + r}\,\mathcal{E} = \frac{0.01}{0.01 + 1}\ 10\ \text{V} = .099\ \text{V}$$

This simple calculation shows $V_{AB} = .099\,\text{V} \ll \mathcal{E}$. In other words, when $r \gg R$, most of the potential drop is across the internal resistance r.

Answer **A**.