**Ex:** A 12 V battery is connected between two parallel plates with $d=0.30$ cm. Find the magnitude of the enclosed uniform field.

○ $\vec{E}$ is directed from the positive plate (A) to the negative plate (B); The positive plate is at a higher potential than the negative plate.

○ The potential difference between the plates must be the same as that between the terminals of the battery.

○ The magnitude of $\vec{E}$ between the plates is given by:

$$E = \frac{|V_B - V_A|}{d} = \frac{12 \text{ V}}{0.003 \text{ m}} = 4.0 \times 10^3 \text{ V/m}$$

○ This configuration is called a parallel plate capacitor.