$\begin{array}{ccc} \textbf{6.3} \\ \textbf{a.) What's C?} & C = \varepsilon_{o} \frac{A}{d} \\ \textbf{b.) What's q on each plate?} & C = \frac{q}{V_{c}} \implies q = CV_{c} \\ \textbf{c.) What's E?} & E \bullet d = -\Delta V \\ \textbf{d.) What's q/A?} & \frac{q}{A} = \frac{CV_{c}}{A} = \frac{\varepsilon_{o}}{\frac{A}{d}} = \frac{\varepsilon_{o}}{d} \end{array}$ 

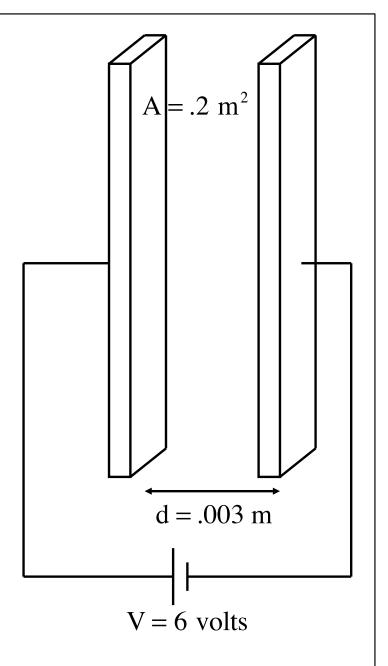
e.) How will they all change is the plates are moved farther apart without disconnecting the voltage source?

e-a.) Looking at the governing equation, if the distance "d" gets bigger, the capacitance will go down.

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e-b.) From e-a, if the distance "d" goes up, the capacitance will go down. Looking at the governing equation for "q," if C goes down with V held constant, q goes down.
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e-c.) Looking at the governing equation, if d gets bigger with the voltage staying constant, E must go down.

e-d.) Looking at the governing equation, if d gets bigger, gets smaller.



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