A Big Idea Review

Coulomb's Law
Force law between point charges

$$\vec{F}_{1,2} = \frac{kq_1q_2}{r_{1,2}^2}\hat{r}_{1,2}$$

q_1 $\vec{r}_{1,2}$ q_2 $\vec{F}_{1,2}$

Electric Field
Property of Space
Created by Charges
Superposition

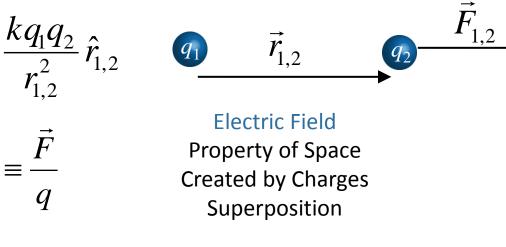**Electric Field**
Force per unit charge

$$\vec{E} \equiv \frac{\vec{F}}{q}$$

Gauss' Law
Flux through closed surface is always proportional to charge enclosed

$$\int \vec{E} \cdot d\vec{A} = \frac{Q_{enc}}{\varepsilon_0}$$

Gauss' Law
Can be used to determine E field $\longrightarrow$

Spheres
Cylinders
Infinite Planes

Electric Potential
Potential energy per unit charge

$$\Delta V_{a \to b} \equiv \frac{\Delta U_{a \to b}}{q} = -\int_a^b \vec{E} \cdot d\vec{l}$$

Capacitance
Relates charge and potential for two conductor system

$$C \equiv \frac{Q}{V}$$

Electric Potential
Scalar Function that can be used to determine E

$$\vec{E} = -\vec{\nabla}V$$