			Units:	**Formulae** **point charges <u>only</u>**	
<u>Vectors</u>	Electrostatic Force:	$\overrightarrow{F_e}$	Newtons: $\mathrm{N} = \frac{\mathrm{kg\ m}}{\mathrm{s}^2}$	$F_e = k_e \frac{\lvert q_1 q_2 \rvert}{r^2}$	$\vec{F} = q\vec{E}$
	Electric Field :	$\vec{E}$	$\frac{\text{Newtons}}{\text{Coulomb}} = \frac{\mathrm{N}}{\mathrm{C}} = \frac{\mathrm{V}}{\mathrm{m}}$	$E = k_e \frac{\lvert q \rvert}{r^2}$	
<u>Scalars</u>	Electric Potential Energy:	PE	Joules: J = N m = V C	$PE = k_e \frac{q_1 q_2}{r}$	$\Delta PE = q\Delta V = -qE\Delta x$
	Electrostatic potential:	V	Volts: $\mathrm{V} = \frac{\mathrm{N\ m}}{\mathrm{C}}$	$V = k_e \frac{q}{r}$	$\Delta V = -E\Delta x$

Change in Potential Energy = ΔPE

Potential Difference = ΔV (units are V)

Charge:	Q	Coulomb: C
Capacitance:	C	Farad: F

$C = Q/\Delta V$ $\quad C = \varepsilon_o A/d$ $\quad E = \frac{1}{2} Q\Delta V = \frac{1}{2} C(\Delta V)^2 = \frac{1}{2} Q^2/C$

$k_e = 8.99 \times 10^9\ \mathrm{Nm^2/C^2}$ $\quad \varepsilon_o = \frac{1}{4\pi k_e} = 8.85 \times 10^{-12}\ \mathrm{C^2/Nm^2}$ $\quad$ Electron charge: $q_e = -1.6 \times 10^{-19}$ C

μ = micro = 10^{-6} $\quad$ n = nano = 10^{-9} $\quad$ p = pico = 10^{-12}