

		Units:	Formulae point charges <u>only</u>	
<u>Vectors</u>	Electrostatic Force:	\vec{F}_e	Newtons: $N = \frac{\text{kg m}}{\text{s}^2}$	$F_e = K \frac{ q_1 q_2 }{r^2}$
	Electric Field:	\vec{E}	$\frac{\text{Newtons}}{\text{Coulomb}} = \frac{N}{C} = \frac{V}{m}$	$E = K \frac{ q }{r^2}$
<u>Scalars</u>	Electric Potential Energy:	U_{elec}	Joules: $J = N \text{ m} = V C$	$U_{elec} = K \frac{q_1 q_2}{r}$
	Electrostatic potential:	V	Volts: $V = \frac{N \text{ m}}{C}$	$V = K \frac{q}{r}$
	Change in Potential Energy	ΔU_{elec}		$\Delta U_{elec} = q \Delta V = -q E \Delta x$
	Potential Difference	ΔV	Volts: V	$\Delta V = -E \Delta x$

Capacitors:

Charge:	Q	Coulomb: C	$Q = C \Delta V_C$	
Capacitance:	C	Farad: F	$C = Q / \Delta V_C$	$C = \epsilon_0 A / d$
Potential energy stored in a capacitor	U_c	Joules: J	$U_c = \frac{1}{2} Q \Delta V_C = \frac{1}{2} C (\Delta V_C)^2 = \frac{1}{2} Q^2 / C$	

Other useful relationships for capacitors:

$$\vec{F} = q \vec{E} \qquad \Delta V = -E \Delta x$$

$$k = 8.99 \times 10^9 \text{ Nm}^2/\text{C}^2$$

$$\mu = \text{micro} = 10^{-6}$$

$$\epsilon_0 = \frac{1}{4\pi k} = 8.85 \times 10^{-12} \text{ C}^2/\text{Nm}^2$$

$$n = \text{nano} = 10^{-9}$$

$$\text{Electron charge: } e = -1.6 \times 10^{-19} \text{ C}$$

$$p = \text{pico} = 10^{-12}$$