**Units: Formulae**

**point charges only**

Electrostatic Force: Newtons: N =

Vectors

Electric Field:

Electric Potential Energy: Joules: J = N m = V C  *= qV = -qEx*

Scalars

Electrostatic potential: *V* Volts: V = *V = -Ex*

Scalars

Change in Potential Energy 

Potential Difference *V* Volts: V

**Capacitors:**

Charge: *Q* Coulomb: C *Q = C* *VC*

Capacitance: *C* Farad: F *C = QVC C = o**A / d*

Potential energy Joules: J  *= ½ QVC = ½ C(VC)2 = ½ Q2/C*

stored in a capacitor

Other useful relationships for capacitors: * V = -Ex*

*K* = 8.99 x 109 Nm2/C2 *o*= = 8.85 x 10-12 C2/Nm2 Electron charge:*e*= – 1.6 x 10-19 C

= micro = 10-6  n = nano = 10-9 p = pico = 10-12