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| <p>The quantities in this table are all mathematically related, and are either ways of describing a field or ways the field interacts with a second charged object.</p> | <p>Requires a system of two or more bodies. An interaction between bodies is quantified. U is the integral of $\vec{F} \cdot d\vec{s}$</p> | <p>These entities describe how space is modified around a charged object. \vec{E} is the gradient of V</p> |
| <p>Resulting quantity is a vector. The magnitude and direction of the Force is valid only at the point for which it is calculated. $F = qE$</p> | $\vec{F} = \frac{1}{4\pi\epsilon_0} \frac{q_1 q_2 \hat{r}}{r^2}$ | $\vec{E} = \frac{1}{4\pi\epsilon_0} \frac{q_1 \hat{r}}{r^2}$ |
| <p>Resulting quantity is a scalar. The magnitude is relative to some arbitrarily selected zero reference location. $U = qV$</p> | $U = \frac{1}{4\pi\epsilon_0} \frac{q_1 q_2}{r}$ | $V = \frac{1}{4\pi\epsilon_0} \frac{q_1}{r}$ |