Thursday Reading Assessment: Unit 0 part II, Electric Potential

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1 Memory Bank

- $PE = qV$ ... Relationship between potential energy, charge, and voltage.
- $V_{AB} = Ed$ ... Relationship between voltage between points A and B, a distance d apart, for a constant E-field E.

2 Voltage and Electric Field

1. If the electric field is 2.5 kV/m in between the plates in Fig. 1, and the plates are separated by $d = 0.1$ m, what is the voltage between the plates?

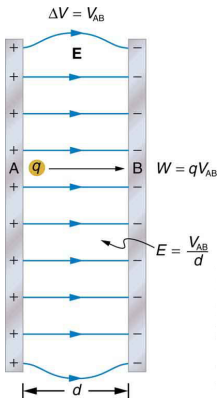

Figure 1: The relationship between potential energy and voltage.

2. Consider Fig. 1, but instead let the voltage be 1 kV, and $d = 0.05$ m. What is the magnitude of the electric field between the plates?

3. Consider Fig. 1, but instead let the E field be 0.6 kV/m, and the voltage be 400 V. What is the distance between the plates?

4. (Same numbers as the prior example). What if a particle of charge $q = +1$ nC and mass 10^{-9} kg was released on the left side of the system. (a) What would be the potential energy? (b) What is the final kinetic energy?