

Wednesday Reading Assessment: Unit 1, Electric Potential

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1 Memory Bank

- $PE = qV$... Relationship between potential energy, charge, and voltage.
- $PE = mgh$... Gravitational potential energy.
- $KE = \frac{1}{2}mv^2$... Definition of kinetic energy.

2 Electric Potential and Potential Energy

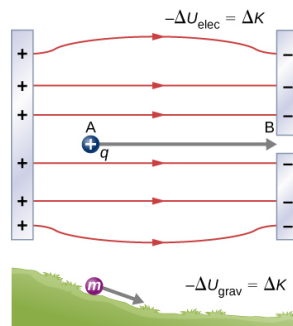


Figure 1: The relationship between potential energy and voltage.

1. Consider Fig. 1. Suppose the mass m rolls down a hill from a height of 30 meters. Neglecting the effects of friction, what will be the final velocity? *Hint: you do not need to know the mass.*
2. Consider Fig. 1. Suppose the charge is $q = 1\mu\text{C}$, and the voltage is 12 V. (a) What is the potential energy before the charge is released? (b) If the charge has a mass of 10^{-6} kg, what is the final speed of the charge?
3. What is the minimum voltage barrier required to *stop* the charge from moving?
 - A: 6 V
 - B: 10 V
 - C: 12 V
 - D: 15 V