

# Thursday Reading Assessment: Unit 0, Voltage

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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

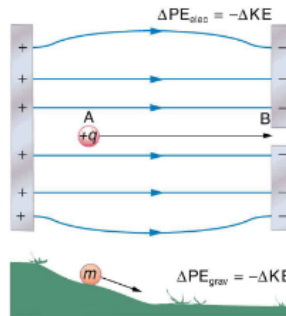


Figure 1: The relationship between potential energy and voltage.

1. Consider Fig. 1. Suppose the mass  $m$  rolls down a hill from a height of 30 meters. In the absence of *friction*, what will be the final speed of the object?
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 will the final speed be after the charge is released?
3. What voltage would be required to *stop* the charge from moving?
  - A: 6 V
  - B: 10 V
  - C: 12 V
  - D: -12 V