



Flipping Physics Lecture Notes:
Introduction to Gravitational Potential Energy with Zero Line Examples

Gravitational Potential Energy is the energy stored in an object as the result of the elevation of that object.

$$PE_g = mgh \quad (\text{sometimes the symbol is } U_g)$$

- m is the mass of the object.
- g is the acceleration due to gravity where $g_{Earth} = +9.81 \frac{m}{s^2}$.
- h is the vertical height above the horizontal zero line.
 - The horizontal zero line is a reference line which you, the person solving the problem, get to decide the location of.
 - You, the person solving the problem, always have to identify the location of the horizontal zero line whenever you are working with gravitational potential energy, every time.
- $PE_g = mgh \Rightarrow kg \cdot \frac{m}{s^2} \cdot m = \left(kg \cdot \frac{m}{s^2} \right) \cdot m = N \cdot m = \text{Joules, } J$

Three Examples of Zero Line Locations:

