$$GPE = -\sum_{i \neq j} \frac{G m_i m_j}{r_{ij}}$$

$$KE = \sum_i \frac{1}{2} m_i v_i^2$$

$$\text{Initial Energy} = GPE + KE$$

$$\text{Final Energy} = GPE + KE$$

$$\frac{\Delta E}{E} = \frac{\text{(Final Energy)} - \text{(Initial Energy)}}{\text{(Initial Energy)}}$$