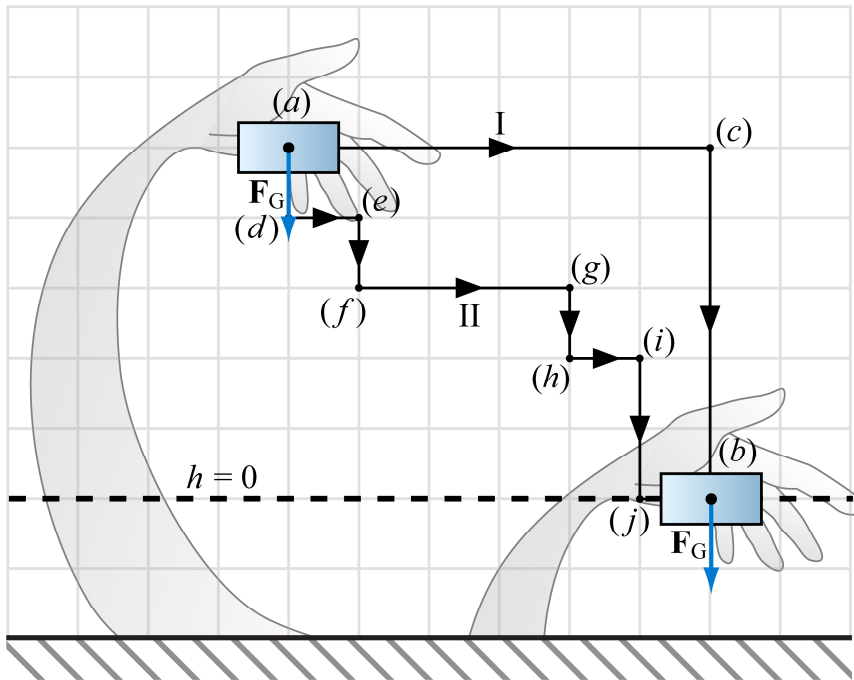


Potential energy

The work that a given force would perform on an object along a path from the object's present position to a **reference position** might be independent of path. In such a case, this work is called the **potential energy** (associated with the force) at the object's current position.

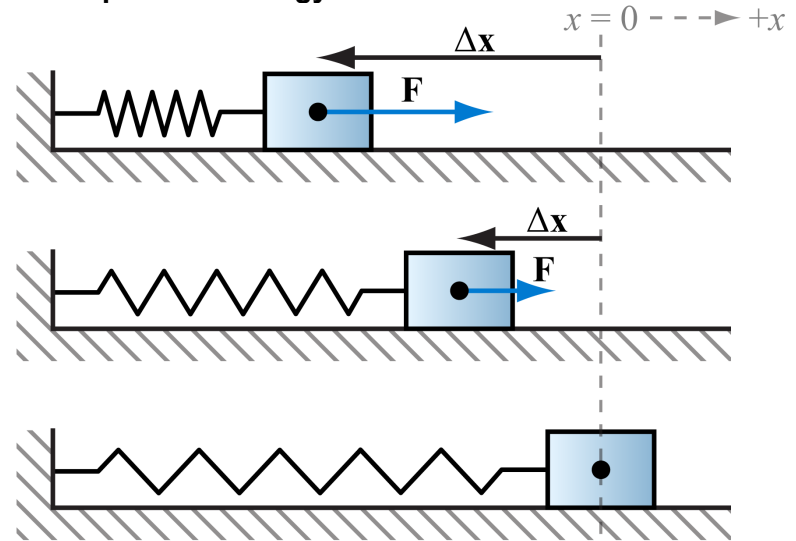
$$\Delta U_F := -\Delta W_F$$

Gravitational potential energy near the surface of the Earth



$$\Delta U_G = mg\Delta h$$

Elastic potential energy



Consider the work that the spring force would perform while pushing back from an initial distance of $|\Delta\vec{x}|$ to a final distance of $|\Delta\vec{x}| = 0$.

$$\Delta U_S = \frac{1}{2}k(\Delta x)^2$$

