

Law of conservation of energy.



$$E_i + W = E_f$$

$$(KE + PE_g + PE_e)_i + W = (KE + PE_g + PE_e)_f$$

$$KE_i + W = KE_f$$

$$W = KE_f - KE_i$$

$$W = \Delta KE \quad \text{WORK-KE THEOREM.}$$

Jan 5-9:25 AM

$$ME_i + W = ME_f$$

ME = mechanical energy (energy which can be observed with a naked eye - macro; easily measured). In this course we will deal with ME only.

There are other types of energy: chemical, thermal, nuclear - which are micro in nature (atomic level).

Jan 5-9:50 AM

Diagram illustrating a physics problem involving energy conservation. A person (mass $m = 100 \text{ kg}$) starts at the top of a hill (initial state i) at a height of 20 m and is initially **AT REST**. The coefficient of friction is $\mu = 0$. The person slides down the hill to the bottom (final state f), where the height is $h = 0$. The speed at the bottom is $V_{\text{BOT}} = ?$.

Energy conservation equations:

$$E_i + W = E_f$$
$$K_i + PE_{g_i} = KE_f + PE_f$$

HW: Calculate the speed at the bottom of the hill.

Jan 5-9:51 AM