Physics Notes – 3/21/2008: Work Done by Nonconservative Forces

- Nonconservative forces change the amount of mechanical energy in a system

\[ W_{\text{total}} = \Delta K \]

If there is 1 cons. and 1 noncons. force, \( W_{\text{total}} = W_c + W_{\text{nc}} \)

\[ W_{\text{total}} = -\Delta U + W_{\text{nc}} = \Delta K \]

\[ W_{\text{nc}} = \Delta K + \Delta U \]

If \( E = U + K \), then \( \Delta E = \Delta U + \Delta K \)

\[ W_{\text{nc}} = \Delta E \]

**Example 1:** Deep in the forest, a 17-g leaf falls from a tree and drops straight to the ground. If its initial height was 5.3 m, and its speed on landing was 1.3 m/s, how much nonconservative work was done on the leaf?

**Example 2:** A 95.0-kg diver steps off a diving board and drops into the water, 3.00 m below. At some depth \( d \) below the water’s surface the diver comes to rest. If the nonconservative work done on the diver -5120 J, what is the depth, \( d \)?
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