22. Since time does not directly enter into the energy formulations, we return to Chapter 4 (or Table 2-1 in Chapter 2) to find the change of height during this $t = 6$ s flight.

$$\Delta y = v_{0y}t - \frac{1}{2}gt^2$$

This leads to $\Delta y = -32$ m. Therefore $\Delta U = mg\Delta y = -318 \approx -320$ J.