# CH. 6 EXAMPLES:

• A force changes the speed of a 10 kg mass from 2 m/s to 4 m/s. How much work did it do? Answer: 60 J.

• A block on a horizontal table with coefficient of kinetic friction $\mu_k$ is pulled by force $\mathbf{F}$ at an angle of $\theta$ with the horizontal. How much work does $\mathbf{F}$ do, if the block moves a distance $D$ along the table in the direction of the horizontal component of $\mathbf{F}$, at constant velocity? The answer should depend on $\mu_k$, $m$, $g$, $D$ and $\theta$. How much work is done by friction in the same situation? How much work is done by the net force $\Sigma\mathbf{F}$ in this same situation?

• A block of mass $m$ is pulled vertically upward by a string, exerting a force $\mathbf{T}$. If the block is at rest at $t = 0$ what power is being delivered to the block by the string at time $t > 0$?

• An object of mass $M$ initially at rest breaks into two equal pieces with equal and opposite velocities, $\mathbf{v}$ and $-\mathbf{v}$. By how much did its kinetic energy change, and how much work was done in whatever internal process caused it to break up?

• A block of mass $m$ is slid up a ramp making an angle $\theta$ with the horizontal, and it travels a horizon-

tal distance $D$ along the table the ramp is on, in the process. The block's speed remains constant. The force that is pulling the block, $\mathbf{F}$, is upward along the ramp, making an angle $\theta$ with the tabletop. Find the work done by the force in terms of $D,\ m,\ g$ and $\theta$.