Some 2nd Law Examples:

- Two boxes of masses $m_1$ and $m_2$ are connected by a string of negligible mass. Box 2 is pulled across a frictionless level table by a force $\mathbf{F}$ of constant magnitude and direction. What is the tension $T$ in the string joining the two boxes as they accelerate across the tabletop?

- Three boxes of masses $m_1$, $m_2$ and $m_3$ are touching on a level, frictionless tabletop. A force $\mathbf{F}$ of constant magnitude and direction is applied to the trailing box, and the three boxes accelerate together. What force does box 2 exert backward on box 1 (the box to which the force $\mathbf{F}$ is applied) as the three boxes accelerate together.

- A box of mass $m_1$ slides on a level, frictionless tabletop, due to the force exerted by a string which runs over a peg to a hanging mass $m_2$. If the hanging mass is falling vertically, what is the tension $T$ in the string joining the boxes?
Two boxes of masses $m$ and $3m$ are joined by a spring of negligible mass and force constant $k$. A constant horizontal force is applied to the leading box of mass $m$ and the system of two boxes slides across a frictionless level tabletop due to this applied force. At a moment when the two boxes have the same acceleration $\mathbf{a}$, by how much has the spring been stretched?