1. A ball dropped to the floor rises to a height less than its original height. Discuss some of the energy conversions that take place in a system like this.

2. Is the change in gravitational potential energy of a stone that falls to the ground different from that of a stone that is thrown to the ground? Explain.

3. A mass is attached to a vertical spring. This causes the spring to stretch and the mass to move downward. Does the potential energy of the spring increase or decrease? Does the gravitational potential energy of the mass increase or decrease?

4. Pushing on the pump of a soap dispenser compresses a small spring. When the spring is compressed .50 cm, the spring potential energy is .0025 J. What compression is required for the spring potential energy to equal .0084 J?

5. A .25-kg ball is dropped from a height of 3.20 m and bounces to a height of 2.40 m. What is its loss in potential energy?
6. A 1.70-kg block slides on a horizontal, frictionless surface until it encounters a spring with a spring constant of 955 N/m. The block comes to rest after compressing the spring a distance of 4.60 cm. Find the initial speed of the block. (Ignore air resistance and any energy lost when the block collides with the spring.) [1.09 m/s]

7. Suppose the spring and block in the above problem is oriented vertically, as shown below. Initially, the spring is compressed 4.60 cm and the block is at rest. When the block is released it accelerates upward. Find the speed of the block when the spring has returned to its equilibrium position. [.535 m/s]