The Three Laws of Thermodynamics

- **The first law** of thermodynamics, also called conservation of energy (energy can be neither created nor destroyed, it just changes form), states that the total amount of energy in the universe is constant. This means that all of the energy has to end up somewhere, either in the original form or in a different form. We can use this knowledge to determine the amount of energy in a system, the amount lost as waste heat, and the efficiency of the system.

- **The second law** of thermodynamics states that the disorder in the universe always increases. After cleaning your room, it always has a tendency to become messy again. This is a result of the second law. As the disorder in the universe increases, the energy is transformed into less usable forms. Thus, the efficiency of any process will always be less than 100%.

- **The third law** of thermodynamics tells us that all molecular movement stops at a temperature we call absolute zero, or 0 Kelvin (-273°C). Since temperature is a measure of molecular movement, there can be no temperature lower than absolute zero. At this temperature, a perfect crystal has no disorder.

When put together, these laws state that a concentrated energy supply must be used to accomplish useful work.