**H2: Thermal Equilibrium**

**Materials:**
- computer with temperature probes, baggies, a large Styrofoam cup, hot water and tap water

**Initial definitions and givens:**
- **Conservation of Energy:** energy can not be created or destroyed. It can only change forms.
- **Thermal energy:** internal energy due to molecular motion and the forces affecting molecules
- **Heat:** energy that is transferred because of a difference in temperature
- **Thermal equilibrium:** occurs when no heat is being transferred

**Initial Instructions and questions:**
1. Get hot water in a large styrofoam cup, about half full.
2. Get some room temperature water in a baggy, about ¼ the amount of hot water, and put the other probe in it.
3. Change the Data Logger time scale (x-axis) to 10 minutes. Change the sampling rate to 1 per second.
4. Put one probe in the hot water and one probe into the baggy. Take data for a minute or so, stirring gently with the probes until the temperatures become constant.
5. What do you predict would happen if you put the baggy into the hot water? What factors do you think will influence the final outcome?
6. After you have made your prediction, try it. Observe temperatures versus time.
7. Draw any conclusions that you can. Did heat flow in this experiment? Did temperatures change? Was your prediction correct?