NAME _____ DATE _____ CLASS _____

INTRODUCTION TO ENERGY FLOW INQUIRY LABS – BACKGROUND

Measure Energy Flow in Chemical Reactions

Concepts

- Endothermic reactions
- Energy and heat exchange
- Exothermic reactions
- Systems and surroundings

Background

When a system releases heat to the surrounding environment during a reaction, the temperature of the surroundings increases, and the reaction vessel, which is part of the surroundings, will feel warm. For example, consider the reaction of oxygen with carbon compounds to produce carbon dioxide. This type of reaction, called combustion, produces energy in the form of heat and flames.

$$\mathbf{CH_4(g) + O_2(g) \rightarrow CO_2(g) + H_2O(g) + Heat}$$

Sometimes a reaction or process requires heat to proceed, and the system will take heat from the surroundings. Since heat is being removed from the surroundings, the reaction vessel will feel cool. A common example of an endothermic process is the melting of ice. Solid water (ice) needs heat energy to help break apart the forces holding it together as a solid. The heat flowing into the ice will cool the surroundings.

$$\mathbf{Heat + H_2O(s) \rightarrow H_2O(l)}$$

In this activity, you will perform a reaction with an observable energy change in a zipper-lock bag.