TOC#2 Activity: Heat Exchange

Objective: To observe and explain how heat exchange works.

Materials: 3 glasses or cups, equal amounts of hot water and cold water, ice cubes

Procedure: **Read the questions below before you start so you can answer the post-activity.**

Complete each drawing: Cup A&B refer to the temp of the ice and water and rate of melting.
Cup C draw what you observe happens to the cup.

A. Into cup A pour a measured amount of hot water. Into cup B pour the same amount of water as cup A but cold water. Take note of the temperature of the two cups.

B. Place into both cups, at the same time, 1 ice cube *(as close as possible to the same size)*

C. Observe the ice cubes.

D. Into cup C pour a measured amount of cold water and place into the water 7 or 8 ice cubes. Observe what happens to the outside of the cup.

1. Predict which cup A or B will have a higher temperature once the ice cube has melted. Explain your choice.

A hot water & ice cube

B cold water & ice cube

C cold water & lots of ice cubes

2. In which temperature water does the ice cube melt more quickly?

3. What happens to the temperature of the ice cube? What happens to the temperature of the water?

5. Was your prediction correct in #1 ?

6. Which way did the heat flow from the water to the ice or the ice to the water?

7. Was the heat lost and the ΔH heat gained between the water and ice in cup A the same amount? Cup B?

8. Explain why one cup has a higher temperature once the ice cube melted.

9. Explain what is happening to the water molecules in the solid ice and the liquid water due to the temp. change.

10. Was energy conserved (no change in the overall energy) in this heat exchange ?

11. Explain what happens to the outside of cup C. What causes this to happen? Hint the cup is cold, what happens to water molecules when they are exposed to cold? What state of matter is water in the air? So ???? What happens ?