

Lesson Plans

Day One:

Present the power point presentation. Use various demonstrations to reinforce heat and energy flow.

Place a hot piece of metal into a pre measured temperature cup of water. Have the students pre predict what will happen. Have the students describe the energy flows in terms of the system and the surroundings. Which process is endothermic and exothermic.

Use a simple Styrofoam cups calorimeter and the equation $q=SH \times m \times \Delta T$ to quantify the energy flow between a hot or cold object and water. Have the students determine what data needs to be measured and what the sources of error are.

Take the students to a refrigerator and car to describe the various heat exchangers and the energy flows,

Day Two:

Tour the Cargill corn milling plant south of Blair. The focus will be on the various heat exchangers used within the plant. Questions should be focused to the students concerning the information that was presented the day before. Plate and shell and tube heat exchangers are the main one to be discussed. A more in depth discussion can be done at the plant to discuss specific reasons for the use of these heat exchangers.

Day Three:

Ice cream activity. If the weather is nice and you have access to a side walk doing this activity outside makes it more enjoyable. If the activity does take place outside be sure and take an empty 5 gallon bucket for the student to pour the brine solution into. **Do not pour the solution in the grass!!** In addition to making ice cream, let the students know ahead of time so they can bring some toppings for the ice cream.