

Task #1 Liberating The Energy

Prior knowledge that we expect that you have so you can understand what is going on in this experiment:

- ❖ All living things are made up of cells
- ❖ Cells are living and therefore must carry out their own life processes such as metabolizing nutrients for energy, growth, reproduction, response to stimuli, etc.
- ❖ Digested food goes to your cells
- ❖ Oxygen goes to your cells
- ❖ Carbon dioxide is a waste product produced by your cells
- ❖ You know the difference between a reactant and a product

The purpose of this lesson is to observe a burning candle in order to determine what happens when something burns, or *oxidizes*, rapidly and to identify the reactants and products in this combustion.

Focus Question: What are the reactants and products of a burning candle? Where do you think the energy was BEFORE the candle was burned?

1. Your teacher will measure the mass of a candle to the nearest 0.1 g before burning the candle during the period. He/She will also measure it at the end of the period. Calculate the difference in mass.

Weight at beginning of period: _____

2. Measure 15ml of bromthymol blue (BTB) solution and pour into a 250ml beaker. Describe the color of the BTB: _____

3. Remove a tea candle from its metal holder. Place the candle's metal holder upside down in the bottom of the beaker and place the wax portion of the candle on top. The candle should not be in contact with the BTB. Draw and label the components of your "before" system in the space provide below.



4. Light the candle and while it is burning, answer the following question: What reactants are involved with the burning of the candle? _____

What two things are quickly released as the candle burns? _____

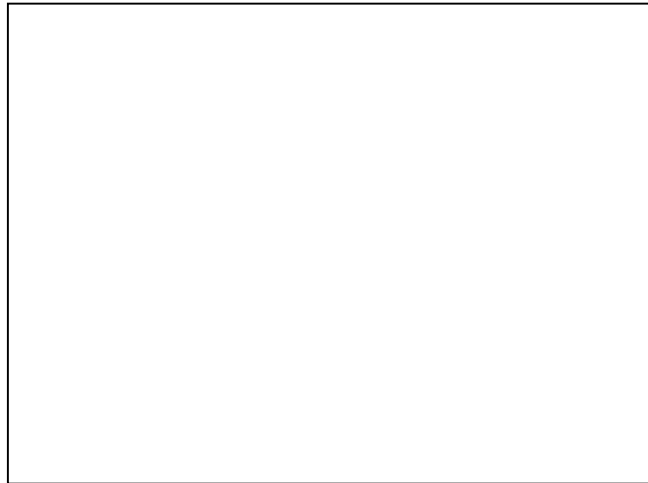
5. Seal off the air from the beaker by covering the beaker with foil. Observe. What happened and why do you think it happened? _____

Make note of any changes or new products you see that were produced in the beaker.

6. Don't remove the foil! Gently swirl the solution around in the beaker for 1 minute. What happened? _____

Why do you think it happened? _____

7. In the area below, draw a labeled diagram of the "after" system, and clearly indicate what changes occurred in your drawing.



8. Now have your teacher measure the mass of the candle that has been burning for the period. Mass at end of period: _____ Difference between beginning and end: _____

How do you explain the difference in the mass of the candle between the beginning and the end of the period? _____

When the wax of the candle burned, it released light and heat. These are both forms of energy. Where do you think that the energy was before the candle was burned? Why? _____