The Atmosphere- *How Much is Oxygen?*

Date _____ Period _____

Problem: When something burns it uses up oxygen. If you place a burning candle in a closed container of air, will it continue to burn?

Materials: Pie pan, ruler, candle, beaker (taller than the candle), match, water, pencil and paper.

Procedures:

1   Use melted wax to stand candle in the middle of a pie pan.
2   Carefully fill the pie pan with water to a depth of 3 cm.
3   Measure the height of the beaker.
                A) What is the height of the beaker? _____
4   Carefully place the beaker upside down over the candle. The lip of the beaker must be completely
         underwater as it rests on the bottom of the pie pan.
5   Measure the height of the water in the beaker.
                B) What is the height of the water in the beaker? _____
6   To calculate the amount of space in the beaker that is filled with water, divide the height of the water
         by the height of the beaker. Give your answer as a decimal to the nearest hundredth.
                C) What decimal did you get? _____
7   To convert this decimal to a percent, multiply it by 100.
                D) What percent is this? _____
8   Remove the beaker. DO NOT WET THE CANDLE.
9   Light the candle.
10   You will now trap a certain amount of air for the candle to burn. Carefully place the beaker over the
         candle. The lip of the beaker must be completely underwater as it rests on the bottom of the pie pan.
11   Observe your setup carefully.
                E) Does the candle continue to burn? _____
                F) What happens to the water level inside of the beaker?

                G) How can you explain this?

12   Measure the height of water in the beaker.
                H) How high is the water? _____
13   To calculate the amount of space in the beaker now filled with water, divide the height of the water
         by the height of the beaker. Give your answer as a decimal to the nearest hundredth.
                I)   What decimal did you get? _____
14   To convert this decimal to a percent, multiply it by 100.
                J)   What percent is this? _____
                K) Based on your experiment, what percent of the air is oxygen? _____
15   Compare your answer to question J with your answer to question D.

Experiments of this kind led scientists to the discovery of how much oxygen is in the atmosphere. The accepted value is 20.946 percent, by volume, of oxygen.

                L) Calculate the % error between your value and the accepted value