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| **LAB: "Burning Up the Atmosphere"**  Let’s say that, until recently, scientists still hadn’t figured out how much oxygen is present in the air we breathe. However, earlier this week, in an article published in a major scientific journal, a scientist named I. M. Knotreel claims to have discovered that (dry) air is 21 % oxygen.  The discovery has caused quite a stir in the scientific community, so this week scientists all over the world are attempting to repeat the experiment used in the study. As they do so, they are carefully evaluating the experimental technique in order to decide whether or not the scientist’s claim is legitimate. Today you will join this endeavor by repeating Knotreel’s simple experiment.  **Purpose:** To determine the percentage of oxygen in air.  **Materials:** candle, shallow pan, metric ruler, calculator, colored water, graduated cylinder, beaker  **Procedures:**  1. Obtain the materials listed above. Use the metric ruler to measure the height of your graduated cylinder cm. Record it below  **height =. . . . . . . cm. Place this number in the 1st column below.**  2. Position a candle in base. Be sure that it is secure.  3. Carefully measure 40 mL of water from the beaker into the graduated cylinder. Gently transfer the water into the pan WITHOUT knocking over the candle.  4. Light the candle and then, carefully, in one motion, invert the test tube over the candle and let go. DO NOT TOUCH THE GRADUATED CYLINDER.  5. Observe what happen. Record your observations here:  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    6. While one person holds the graduated cylinder, another should use the ruler to measure the height the water went up in the tube. Record in the table.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Trial #** | **Height of the graduated cylinder.**  **A** | **Height the water rose**  **B** | **Calculate**  **B/A** | **X 100 =**  **Percent of Oxygen %** | | | **1** |  |  |  | | **2** |  |  |  | | **3** |  |  |  | |  | | | **Total:** | |  | | **Average:** | |  |   7. Once you have the technique down, you will perform the "burning of air" technique two more times.  8. To calculate the percentages simply divide the height of the water by the height of the graduated cylinder. **B divided by A**  9. Multiply this number by 100 to get the percent of oxygen.  10. Average your results from the trials. . . . . **Average = \_\_\_\_\_\_\_ % Oxygen**  **Follow-up questions**  1. Why did the candle stop burning? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  2. Why did the water rise into the tube? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  3. Were you close to the 21% that Knotreel discovered? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  4. List 2 of the flaws in this technique.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |