Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_                                                Period \_\_\_\_

**Potato Enzyme Lab**

**Introduction**

Enzymes are chemicals found in **living** things which speed up chemical reactions.  In this lab, enzymes found in potato will speed up the reaction with **hydrogen peroxide** as it changes to **water** and **oxygen gas**.

The reaction is..

                                       

Hydrogen Peroxide builds up in the cells and must be broken down by the  enzyme catalase or the organism will die. In this lab, cooked potato, raw potato and mashed raw potato will be exposed to Hydrogen Peroxide and the reaction will be observed.

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| --- |
| **Complete the introduction by answering the question below...**Based on your knowledge of enzymes, how do you think the cooked potato, raw potato and mashed raw potato will react differently when exposed to hydrogen peroxide? Answer in complete sentences at the end of the paragraph above.**(Please delete this box when you are done.)** |

**Materials**

Hydrogen peroxide solution               Mortar and pestle                   fresh and cooked potato

4  test tubes                                   10 mL graduated cylinder        plastic spoon

Forceps                                         sand                                    test tube rack ruler

**Procedure**

1. Label the test tubes # 1, 2, 3, and 4.

2. Place 4 mL hydrogen peroxide into **each one** of the test tubes.

3. Sprinkle a pinch of sand into test tube #1 and record reaction on chart.

4. Now place a pinch of sand into tubes 2, and 4.

5. Using forceps select a raw potato cube and drop it into test tube #2.  Observe for a few minutes, measure the reaction if possible, and record on chart.

6. Take a piece of raw potato about the same size as the one you used before, and put it into the mortar along with a pinch of sand.  Using the pestle, grind the potato and then transfer the ground material, sand and all, into tube #3.

7. Observe for a few minutes, measure the reaction if possible, and record.  Compare the activity of the whole potato and the ground up potato. Add details about what is observed.

8. Obtain a piece of boiled potato and place it into test tube #4.  Observe for a few minutes, measure the reaction if possible, and record reaction.

9. Empty all four test tubes into the waste container in the sink.  DO NOT pour any sand or potatoes down the drain.

10. Rinse test tubes, graduated cylinder and mortar and pestle with water.

11. Place test tubes and graduated cylinder upside down on rack to drain.  Put all other supplies back in plastic tray.

**Results** (Please fill in the chart with the information needed and add a title)

**Title \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |
| --- | --- | --- |
| **Test Tube #** | **Contents** | **Observations** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

Additional Observations:

**Discussion**

|  |
| --- |
| **The discussion is where you show that you understand the lab. Explain your results and show that you understand what the results mean. Make connections to the science behind what you have observed in the lab.**Use your graphic organizer to make a rough draft of your response, then include your final draft here.**(Please delete this box when you are done.)** |

**Conclusion**

|  |
| --- |
| **The conclusion answers the questions asked in the introduction. Discuss new topics that could be studied based on this experiment. Explain what may have gone wrong in the lab and make suggestions of ways to do it better next time.** Use your graphic organizer to make a rough draft of your response, then include your final draft here.**(Please delete this box when you are done.)** |

                                                      Lab Report Rubric

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CATEGORY | **4** | **3** | **2** | **1** |
| **Introduction** | The purpose of the lab, or the question to be answered during the lab, is clearly identified and stated. | The purpose of the lab, or the question to be answered during the lab, is stated, but is unclear. | The purpose of the lab is not correct. | The purpose of the lab is not stated. |
| **Procedure and Materials****\*No point value for this lab** | Procedures are clearly stated, detailed and easy to repeat. | Procedures are somewhat repeatable. Steps are outlined, but lacking some detail. | The steps are outlined, but there is not enough detail to repeat the procedure. | Several steps are not outlined, and there is not enough detail to repeat the procedure. |
| **Results/Observations** | Exceptional, accurate representation of the data in tables and graphs. Qualitative observations go above and beyond. | Accurate representation of the data in tables and graphs. Qualitative observations are included. | Weak representation of the data in tables and graphs, or no qualitative observations | No table and graph, or no qualitative observations. |
| **Discussion****(Points x 2)** | Makes insightful and original connections between the lab and other scientific concepts. All ideas are clearly explained and supported. | Student makes connections between the lab and other scientific concepts. | Discussed scientific concepts somewhat, but needs more information. | Discussion lacks purpose. |
| **Conclusion****(Points x 2)** | Student has gone above and beyond in explaining their conclusion based upon their results. Possible sources of error are clearly explained. | The conclusion is clearly based upon their results. Possible sources of error are explained. | Conclusion is loosely based upon results. Weak possible source of error. | Conclusion does not answer question or purpose. No source of error. |
| **Lab Format****Spelling****Grammar** | No errors in lab format, spelling, or grammar. | Few errors. | Many errors. | Poorly done. |

Total Grade                   /28