***Environmental Sciences 12***

***Water Bacteria Lab Write Up***

**Lab Due Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Section** | **In A Nut Shell** | **Details** |
| **Big Question** | * **What are you trying to answer** | **In your OWN WORDS, what is this lab trying to explore? Must start with a what, where, how, or if.** |
| **Background Research** | * **Look at a minimum of 3+ different resources and write a summary of what is already known about your question** | * **Do some research on water and bacteria** * **What type of bacteria do you find in water? Why is bacteria in water typical? Is there different types of bacteria in different types of water? Does flow rate impact the amount of bacteria in the water?** * **Must use at least 3 resources (put in Bibliography section)** |
| **Hypothesis** | * **What is changing and what do you think would happen** | **If…**  **Then…**  **Because…**  **Example 🡪 If the bacteria from stagnant and rushing water are compared, then it will be found that stagnant water has more bacteria in it. This is because…** |
| **Variables** | * **Independent** * **Dependent** * **Control** | **Independent Variable 🡪 What is changing (type of water)**  **Dependent Variable 🡪 What you are measuring (number of bacteria colonies)**  **Control Variable 🡪 What are you using as a control to show what would happen WITHOUT the independent variable (ie. Test with distilled water)** |
| **Safety** | * **What safety concerns are there?** | **How will you stay safe in your experiment? Goggles, Bunsen burner, etc. In paragraph format** |
| **Procedure** | * **Step by step of what you did** * **Needs to be in enough detail to be replicated by another scientist** | * **I have a Step By Step (MUST BE NUMBERED like a recipe) that have details so that other scientists could do EXACTLY what I did** * **I have included EXACT measurements in my procedure (weights, distances, times, etc)** |
| **Observations** | * **What did you see and observe in your trials and tests** | * **Draw/take a photo of your petri dishes and your gram stains (take a photo with your phone and put into lab report)** |
| **Data Table/graph** | * **Organize your data** | **Data table of colony count** |
| **Conclusion** | * **Did it prove or disprove your hypothesis?** | **Summarize what you found in one or two sentences and refer it back to your hypothesis….did your data prove or disprove your hypothesis** |
| **Sources of Error** | * **What could have contributed to some of your results that were out of your control?** * **What would you do differently next time to improve your experimentation procedure** | 1. **Were there any errors in your equipment? How would this impact your results?** 2. **Any errors in your procedure? How would this impact your results?** 3. **Any errors in your number of trials? How would you fix this for next time?** 4. **Anything that might have impacted your results that you couldn’t control? Temperature? Humidity? Chemicals on the counter?** |
| **Discussion** | * **What did you find interesting?** | * **Why is this important to know for the average person?** * **How does this impact your understanding of use of water?** * **What was your main learning?** |
| **Areas of Further Study** | * **What experiments could you do that furthers your understanding in this area?** | * **If resources were unlimited what other questions, on a similar topic, would you ask?** |
| **Sources Used** | * **What resources did you use for your background research?** | * **List the 3+ websites or resources you used for your background research** |

**Marking Criteria:**

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| --- | --- | --- | --- | --- |
| **Learning Goal** | **Beginning**  **1** | **Developing**  **2** | **Proficient**  **3** | **Sophisticated 4** |
| **Questioning –** does your question reflect your curiosity? |  |  |  |  |
| **Planning –** have you shown up prepared and understanding what to do? Prepared in advance? |  |  |  |  |
| **Safety –** goggles at all times, safe in lab with all indicators, disposal of chemicals |  |  |  |  |
| **Analyzing Data –** nicely set up observations and data tables |  |  |  |  |
| **Reflection –** thoughtful sources of error and areas of further study |  |  |  |  |
| **Societal Impact –** in your areas of further study and background research have you focused on societal impact of your question? |  |  |  |  |