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How to write a hypothesis for chemistry lab report

Your introduction will answer the following questions: What do we know beforehand (previous knowledge or research around the experiment)? For clarification, ask the laboratory instructor. We have already mentioned the main constituents of the title page. The appropriate order is: Name and amount (in grams) of the final product Melting point of the final product with the known literature value Gas Chromatography Mass Spectroscopy (GCMS) data IR data 4 Write a Results and Discussion Section. If you have questions, make sure you bring them up with the instructor before class.[1] Pay careful attention to the safety precautions recommended for the type of experiment you're doing. An abstract is a quick summary that sums up the whole thing (hypothesis to be proven, and conclusions that are reached). For example, "One problem in conducting this experiment is X" rather than "One problem in conducting this experiment was/will be X." Advertisement 3 Hypothesize. Sometimes, your teacher or professor will give you specific instructions for how to format and write your lab report, and if so, use that. You may also briefly summarize your results in this section, though avoid going into great detail. Therefore, we have divided our guide into three major sections that are:Parts of the lab report:A step-by-step review:Writing your project.It's necessary to begin with an overview of the main sections that should be present on a laboratory report for chemistry.SectionDescriptionTitle PageProvides general data about your experiment, including your name, date, the title of the experiment, your teammates (if you have any), the course you are taking, and your instructor's name. You should write a hypothesis right at the end of your intro. 1 paragraph) Restate your goals (In summary, the goal of this experiment was to measure...) Restate your methods (This hypothesis was tested by...) Key findings (The findings supported the hypothesis because...) Limitations (Although, certain elements were overlooked, including...) Significance and future research (This experiment presents possibilities of future research contributions, such as...) Sources (approx. Afterwards, you move to the Discussions, in which you ought to plainly explain all the numbers, observations and collected data. The abstract (no more than 200 words) should give the reader the basics about your experiment and its results. This is where you analyze your results and whether your experiment went as expected. While the abstract tends to be around 200 words summarizing the entire study, the introduction can be longer if necessary, covering background information on the study, what you aim to accomplish, and your hypothesis. 200 words) Background (This experiment looks at...) Objectives (It aims to contribute to research on...) Methods (It does so through a process of...) Results (Findings supported the hypothesis that...) Conclusion (These results contribute to a wider understanding about...) Lab Report Example (Continued) 3) Introduction (approx. Your laboratory report begins with a title page. Though there are elements that will appear in all lab reports, each instructor might have different expectations. 3) Hypothesis - What you think will happen when you test the gap in knowledge. You're free to use reading aloud and in your head, reading everything again, and using special grammar and spelling checking applications.To sum up, keep in mind all these guidelines when you're assigned to write a lab report. In other words, if there are no variables, then a hypothesis would not be required. Don't draw any conclusions when you record data and don't explain it in the section called Results. Are you clarifying conflicting results? This observation leads to the question: Does going to school and getting an education improve health and living conditions? Perhaps when you tested the first round of basil plants, the days were sunnier than the others. In addition, a hypothesis involves experimentation, in-depth and comparative observation, as well as collection and analysis of various sources. Background: Provide a brief overview of the topic being studied. In case you're left to your own devices, here are some guidelines you might find useful. If so, how? The information must be presented on the upper right-hand side of the page. Since it's at the beginning, however, you will need to wait to write it until the end. Abstract: This is a short description of key findings of the experiment so that a potential reader could get an idea of the experiment before even beginning. Data: Here, you should document what happened in the experiment, step-by-step. If you make a mistake when writing in pen, only draw 1 line through the mistake, then continue writing. This means that you need to have everything previously recorded in your lab notebook. Restate your hypothesis in other words. If not, why not? Hypothesizing, or making an informed guess about what the result of the experiment will be, is one of the key elements in any scientific experiment. Meredith Juncker is a PhD candidate in Biochemistry and Molecular Biology at Louisiana State University Health Sciences Center. Most lab reports end up being 5-10 pages long (graphs or other images included), though the length depends on the experiment. This is the part where you will conduct the experiment and write down every step. Objectives: What problem is being addressed by this experiment? Back up everything with the appropriate references.MaterialsMake a list of all the materials you've used during your experiment.Methods/ExperimentalSectionThis section highlights your experimental procedures step by step and provides information about the scientific methods you have used to complete the experiment.DataYou should mention all the results you've collected during your experiment. A hypothesis needs to have a because rationale. You can typically find this in the lab manual for the class. Why do you believe that your experiment will turn out in a particular way? Use passive voice -- "Water was poured" rather than "I poured water." Stay in the third person -- "Scientists claim X" rather than "I discovered scientists claim X." Be careful of verb tenses. Lab Report Example (Continued) Factors influencing results: This is also an opportunity to mention any anomalies, errors, or inconsistencies in your data. You ought to be aware of every section and understand how to complete them properly. Conclusion: Your conclusion will sum up the results of your experiment, as well as their significance. At the end of the Experimental Section, you need to let the reader know exactly what emerged from your experiment. The discussion is also a good place to mention any mistakes that were made during the experiment, and ways you would improve the experiment if you were to repeat it. 4) Experimental Section/Materials and Methods - Describe your reagents, protocols, and every detail of what you did. You can reference other articles all over your manuscript (especially in the introduction and discussion sections), but don't forget to put them together (or at the bottom of each page), and cite them properly.The final step is to proofread your lab report. Note: this is not a statement of proof, just your findings in relation to the hypothesis. This should not be an extensive literature review, but rather, a window into the most relevant topics a reader would need to understand in order to understand your research. Why did you choose to do this experiment? "... more Share your story Students have to deal with multiple academic tasks, and writing lab reports (lots of them!) is one of them. Like the other written sections, it should be as concise as possible. A hypothesis should be in the form of a statement, not an "if/then" prediction. Ask a Question Advertisement This article was co-authored by Meredith Juncker, PhD. Based on this question a hypothesis can be developed: Educated individuals live a better and healthy life because they receive a higher income and can make informed lifestyle decisions. This helps to evaluate how the manipulation of the independent variable affects the outcome of the experiment. Nonetheless, you should leave some space and skip it until the entire project is finished. Make sure this does not become too broad—keep it to the scope of this project. Sugar and temperature kept constant.Controls: Tube 1 contains no yeast and is the negative control. In paragraph form, write out your methods in chronological order, though avoid excessive detail. They could be divided in different parts, and those would describe your actions.The section Data contains the numerical facts and Observations that provide the changes that took place. You do not need to interpret all of the data in this section, but you can describe trends or patterns, and state which findings are interesting and/or significant. A lab report is an overview of your experiment. Limitations: What about your experiment was less-than-ideal, and how could you improve upon the experiment in future studies? Methods: How was the study designed and conducted? What do you think this experiment will do? A hypothesis ... Writing a scientific text or a laboratory report forces you to think about what you have done and why. Write a couple o paragraphs and explain the purpose of your experiment. Start by providing the background on your topic, as well as what previous research has shown. Co-authors: 16 Updated: April 15, 2025 Views: 120,813 Categories: Science Writing | Chemistry Print Send fan mail to authors Thanks to all authors for creating a page that has been read 120,813 times. Unlike the abstract (or the conclusion), the introduction does not need to state the results of the experiment. State your hypothesis, as well as how you will test it. Sources: Often in APA style, you should list all texts that helped you with your experiment. Most of your report should use present tense verbs, unless you are explaining what you did in the experiment, or what has been written in the past about it. Questions for future research: Based on this, how might your results contribute to future research? Lab Report Example (Continued) Hypothesis: Now, state your hypothesis. It should consist of 3-4 sentences, not many more. How did the experiment match (or not) your hypothesis? Next, explain the gap in research that you will be testing. Here, refer back to the gaps in research that you mentioned in your introduction. A hypothesis is a statement that explains the phenomenon that is being investigated (what would happen/because). Here's an example of a prediction vs. Explain your choice and how your choice helps to conduct a safe and accurate study.Take instant records of everything that happens during the experiment in your lab notebook. It should consist of no more than a couple of paragraphs and end with at least one hypothesis.The body of your project consists of the procedure, materials and methods employed; data; results and observations. Question How do I put my chemistry lab report in order? This section often includes graphs and tables with data, as well as descriptions of patterns and trends. Make sure you answer the why question with a because phrase. Its main purpose is to explain what you did in your experiment, what you learned and what the results mean.Performing experiments and reporting them properly is a cornerstone of on your way into learning chemistry.But how do you write a chemistry lab report properly?It's now time to find out!An experimental chemistry session is not complete without writing a good lab report. Given the background you just provided, what questions do you still have that led you to conduct this experiment? Refer back to your introduction—similar language is okay. So, make sure your abstract is as clear and direct as possible, and under 200 words (though word count varies). This depends on the requirements set by your lab instructor. In a conclusion, include the following: Whether the hypothesis was supported or refuted, why, and an error analysis. Hypothesis: Basil plants placed in direct sunlight for 2 hours per day grow at a higher rate than basil plants placed in direct sunlight for 30 minutes per day. You will also need to indicate the temperature of the experiment and the solvent. Keep this part down to one sentence, and voila! You have your introduction. Introduction: This is comprised of one or several paragraphs summarizing the purpose of the lab. The purpose of the academic abstract is to help a potential reader get an idea of the experiment so they can decide whether to read the full paper. Always be clear, cite the appropriate references, and be objective with your analysis and conclusions! Prior to starting any lab activity, formulate a hypothesis. Good luck! For more reading on coursework success, check out the following articles: Prior to starting any lab activity, formulate a hypothesis. The section Procedure commonly consists of several steps that were followed for the proper conduction of the experiment(s). The section provides necessary information for someone who would want to replicate your study. Sometimes, conclusions also suggest future studies. 3 Write an Introduction. It needs to be testable and falsifiable, and it must explain something about nature. Using the citation style chosen by your instructor, write down all of the books or websites that you used to prepare and learn about the experiment. Rather, it's a statement of explanation for observations, which should be written in present tense and as specifically as possible (for more information on hypotheses, consider reading this article from the National Library of Medicine). Predictions should be reworked until it can be restated as a definitive statement. Thus, you'll never miss something important, which can cost you essential grades. Even though you're writing the abstract at the end, it will end up going at the beginning of the report.[8] Advertisement Add New Question Question Can I write with pen on white paper for a chemistry lab report? Write each section properly to receive the highest grades for your experiment. What is a lab report? This is the outline and instructions given to you by your teacher or professor. How to write a discussion section Here, we're skipping ahead to the next writing-heavy section, which will directly follow the numeric data of your experiment. The last sentence of your introduction is called a hypothesis or a thesis statement. Continue reading for the main elements of a lab report, followed by a detailed description of the more writing-heavy parts (with a lab report example/lab report template). 1-2 paragraphs) (ex: 10 basil plants were measured throughout a span of...) 6) Data (brief description and figures) (ex: These charts demonstrate a pattern that the basil plants placed in direct sunlight...) 7) Discussion (approx. 5) Results - Explain what happened, providing your data. Methods: This is where you describe your experimental procedure. Importance: Now, what are the gaps in existing research? I have never written one, but this article gave me the confidence to do so. Conclusion: Were the results expected? Unlike the Results and Discussion Section, the Conclusion is more focused on the broad ideas brought up in your introduction than the specifics of your particular experiment. Keep in mind that it's only an idea about what might happen, and you often come up with a different result.[3] "At 50 degrees Celsius, when XO is combined with YO, XY and O2 will form." 4 Be familiar with your instructor's expectations. Dependent Variable: In the fermentation lab, the amount of CO2 produced is the dependent variable, what is being measured.Dependent Variable: In the fermentation experiment, the amount of yeast is the dependent variable, what is being changed. 1-2 paragraphs) Intro (This experiment looks at...) Background (Past studies on basil plant growth and sunlight have found...) Importance (This experiment will contribute to these past studies by...) Hypothesis (Basil plants placed in direct sunlight for 2 hours per day grow at a higher rate than basil plants placed in direct sunlight for 30 minutes per day.) How you will test your hypothesis (This hypothesis will be tested by a process of...) 4) Materials (list form) (ex: pots, soil, seeds, tables/stands, water, light source) 5) Methods (approx. 2-3 paragraphs) Support or reject hypothesis (These findings support the hypothesis that basil plants placed in direct sunlight grow at a higher rate than basil plants given less direct sunlight.) Factors that influenced your results (Outside factors that could have altered the results include...) Implications (These results contribute to current research on basil plant growth and sunlight because...) Questions for further research (Next steps for this research could include...) Lab Report Example (Continued) Conclusion (approx. However, they may prefer that you type up your report or write your report in a spiral notebook. Unlike creative essays or papers for humanities classes, a report for chemistry is not supposed to have your own personal stamp on it. What will you learn? Were there problems in doing the experiment that might have affected the results?6) As part of this section, write a paragraph about how your results could be used in the future, or the future direction research could go based on your findings. Therefore, we can hit the text of your project. This article has been stamped on it. Here's an example: "Using a burner, we heated Liquid XO and YO to 50 degrees Celsius. 1 Familiarize yourself with the lab manual. Perhaps one of the basil pots broke mid-experiment so it needed to be replanted, which affected your results. Mention whether you've achieved your initial goal and explain its value.Importantly, do realize that if a hypothesis cannot be proven, or an experiment doesn't give you the results you expected, it doesn't mean that your experiment and lab session was a failure. Stronger statement: These findings support the hypothesis that basil plants placed in direct sunlight grow at a higher rate than basil plants given less direct sunlight. Do not just copy the lab manual -- tell the reader what happened in your particular experiment. Meredith Juncker, PhD Scientific Researcher Meredith Juncker is a PhD candidate in Biochemistry and Molecular Biology at Louisiana State University Health Sciences Center. 1 page, usually in APA style) Final thoughts - Lab Report Example Hopefully, these descriptions have helped as you write your next lab report. Treatment Group: Tubes 2-6 with increasing amounts of yeast. It's important to note that a hypothesis is not the same as predicting a future outcome of an experiment. It is extremely common in chemistry to find yourself on this kind of situations! You only need to be able to explain why you got the results that you got, and how would you go around to fix them!Don't forget about the contributors (labmates, supervisors...) to your research. You should also obligatorily use some secondary sources to support your theory. Laboratory reports have a particular written style. It should be self-contained, meaning that a person should be able to read the abstract and get a summary of your entire work without having to read any other section. A hypothesis has explanatory power. Here is a list of points to cover in your lab report discussion: Support or reject the hypothesis. Begin by stating whether or not the results of this experiment supported your hypothesis. Keep in mind that each course might have slightly different requirements for the details of the report as well as whether it should be handwritten or typed -- this article gives you an overview of typical components. The discussion includes any calculations and interpretations based on this data. In a short and concise section, sum up what you learned from the experiment and whether it went as you thought. It's necessary to add brief comments concerning each of them. 2 Know the format. The introduction usually includes the hypothesis, as well as some background information. It is recommended to write the abstract last. If you were to repeat the study, how would you change it so that the results were more consistent? It is the chemical reaction that you are going to be conducting, laid out with the reactants and products labeled and their structure. You will need to incorporate these into your lab report. Extract conclusions from your data.ConclusionSummarizes the entire project regardless of the success or failure of your hypothesis and explains it.Graphs and TablesRepresent your dependent and independent variables in the form of graphs and/or tables. Hopefully this will be useful as you begin your lab report. Writing helps you to uncover (and then of course fill) gaps in your knowledge or ... Your hypothesis/predictions should also go in the introduction. The essential writing elements are:[2] Write in complete sentences. What do you believe you will discover? This would also typically include your textbook.[7] This includes any relevant papers you read before conducting your experiment, even if you didn't directly cite them in your report. 3 Create an abstract. Dependent Variable: Elements measured or counted by an investigator in response to a change in an experiment as a result of a change in the independent variable. Independent Variable: A variable that drives/manipulates a change in the dependent variable. This will give your reader the basics of the experiment you will be conducting. Results: What results were found and what do they mean? 1) Title (ex: Effects of Sunlight on Basil Plant Growth) 2) Abstract (approx. What are the next steps, or the next experiments on this topic? Advertisement 1 Write a Conclusion. (optional)This data appears in the middle of the title page.The next section is the Introduction and it begins with this word in the left upper corner of your report. Any lab report should allow the person reading it to be able to reproduce the exact procedure (and result, hopefully) carried out in the lab. You already know what it consists of. For any chemistry lab report, you will need to write down or type the entire procedure and everything observed during the lab activity. How you test your hypothesis: This is an opportunity to briefly state how you go about your experiment, but this is not the time to get into specific details about your methods (save this for your results section). How to write a lab report conclusion This is your opportunity to briefly remind the reader of your findings and finish strong. All the points (the title, your name, collaborators, etc.) should be mentioned on the separate line.Afterward comes the second part, which includes:The course titleTitle of the experimentTitle of the parts within the experimentSemester, year, etc. Previous Section Next Section Perhaps you're in the midst of your challenging AP chemistry class in high school, or perhaps college you're enrolled in biology, chemistry, or physics at university. When writing an abstract for a scientific lab report, we recommend covering the following points: Background: Why was this experiment conducted? Template for beginning your lab report Here is a compiled outline from the bullet points in these sections above, with some examples based on the (overly-simplistic) basil growth experiment. How to write the introduction The introduction is another summary, of sorts, so it could be easy to confuse the introduction with the abstract. Often, the title looks something like, "Effects of ____ on ____." Sometimes, a lab report also requires a title page, which includes your name (and the names of any lab partners), your instructor's name, and the date of the experiment. "Provide a clear overall picture, of how to write my laboratory reports for Chemistry 400. Lastly, we've included an outline that can help get you started. Our ultimate guide sheds light on the main parts of lab report writing. Do these results fill these gaps as you hoped? You will tell the reader what you did and why, and then the results. Discussion of results: This is the overview of your findings from the experiment, with an explanation of how they pertain to your hypothesis, as well as any anomalies or errors. Here are elements to include as you write your conclusion, in about 1-2 sentences each: Restate your goals: What was the main question of your experiment? At some point, you will likely be asked to write a lab report. Experiment 7: Identification of the Results of X + Y Eloise Teixeira (@teixeira@wonderful.net) Partner: Jose Marques (@marques@wonderful.net) CHEM 215-08 July 14, 2015 Professor Lewis 2 Leave space at the beginning for your abstract. The combination of the 2 liquids formed an O2 gas and Liquid XY inside the tube." 3 Record your results. 6) Discussion - Provide your data interpretations, note any issues or mistakes, and suggest future directions. If he or she didn't express a preference, begin with the title of the experiment you are going to conduct. Any lab report will need to include your name and the name of your lab partner(s) and their email addresses. 7) References - Include all of your sources! Question What exactly do I include in a conclusion? Therefore, you have to cite and make references according to the assigned writing format. Meredith Juncker, PhD Scientific Researcher Meredith Juncker is a PhD candidate in Biochemistry and Molecular Biology at Louisiana State University Health Sciences Center. All in all, make sure to keep your scientific lab report concise, focused, honest, and organized. Be sure to include the lab manual. This function should be fulfilled in the sections Discussions or Analysis sections, which should come right afterwards.Your conclusion makes a brief summary. Your conclusions provide an overall summary of the entire lab report, and the whole experimental session itself.The last lap in our "race" is to write a laboratory report. Advertisement 1 Include the Reaction Equation. This information is necessary to include because your goal is to convince your audience of your experiment's importance to ... You should determine whether you've reached your hypothesis or not. This will be the part where you sum up your work. Record every single thing that happened, even if it seems insignificant or silly. It shows what you hope to achieve at the end of your research. The main body consists of several parts and of course, each has its purpose. You are supposed to keep track of everything you do in the lab in your laboratory notebook, and then using that notebook to write down your lab report, not the other way around.Now, we'd like to go through the main stages of a chemistry lab report. What was the purpose of the experiment? Simply record facts but don't explain them yet.ResultsA researcher is supposed to explain all collected data in words.DiscussionThis section serves as the interpreter of the results. Hypotheses can be formatted in the following manner: As the _____ (independent variable) changes (increases/decreases), the _____ (dependent variable) will also change (increase/decrease) because _____. Does it prove your hypothesis or disprove it? Tubes 2-6 are the positive controls. You should introduce the materials and methods you need to conduct the research. Make sure you understand exactly what you are doing and why. Her studies are focused on proteins and neurodegenerative diseases. Here is a possible order with which you can organize your lab report introduction: Intro of the intro: Plainly state what your study is doing. Also provide the date that you did the experiment, the name of the teacher or professor, and the class name, number, and section number (if applicable). You should leave space for an abstract right after.Introduction/Purposeofit's a couple of paragraphs long section, which briefly states the main purpose of your project. Implications: How do your results contribute to existing research? For example, at 50 degrees Celsius, XO(I) + YO(I) -> XY(I) +O2(g). 2) Introduction - Include the background information, and point out the gap in research you're addressing, a hypothesis. Prediction: The plants placed by the window will grow faster than plants placed in the dark corner. 2 Cite your sources. How to write the abstract The abstract is the experiment stated "in a nutshell": the procedure, results, and a few key words. Here are some brief explanations of the essential parts of a lab report: Title: The title says, in the most straightforward way possible, what you did in the experiment. Some lab instructors will allow you to write with pen on white paper: Explain what the results mean, and incorporate research from other sources if relevant. Weaker statement: These findings prove that basil plants grow more quickly in the sunlight. Download Article Download Article Lab reports are an essential part of scientific study and knowledge. Significance and future research: Why is your research important? Lab Report Example (Continued) Materials: Perhaps the simplest part of your lab report, this is where you list everything needed for the completion of your experiment. Is this problem better understood now than before? Make sure to include course readings, outside sources, and other experiments that you may have used to design your own. Remember that different instructors may have different preferences for structure and format, so make sure to double-check when you receive your assignment. Make sure you follow your instructor's preferred order. The investigator assumes that experimental outcomes can be predicted and even changed by changing/manipulating an independent variable.Treatment Group: Section of the experiment in which an independent variable is manipulated.Control Group: Section of the experiment in which an independent variable is omitted or set at standard value. Grades are not determined by the accuracy of hypotheses, but if it is testable as written. Your abstract appears soon after the title page. Never rely on your memory!Afterwards, you'll interpret the data and explain it using plain words. What are the logical next-steps for studying this topic? Document everything as you are going through the process.[5] Keep in mind that other scientists will use this section of your paper to reproduce your results, so be as specific as possible. Including references here is also highly encouraged. In other words, it says, "Now that we have the data, why should we care?" This section asks, how does this data sit in relation to the hypothesis? Everything depends on the educational institution.It is important to know that usually lab reports are written after the lab session is finished. For example, you might want to add a representation of the TLC of your reaction.ReferencesEnlist the works of other scientists whose studies and articles were used to complete your project.Mind that sometimes these sections are called differently but have the same purpose. Your conclusion should be especially concise (avoid going into detail on findings or introducing new information). Be sure to use the proper format. Some of the sections may be missing, but the general structure should be close to this. For another example, the following hypothesis could be developed based on our previous fermentation observation: As the yeast concentration increases, more CO2 will be produced because there is more yeast present to ferment. We poured the liquids into a third tube, which we'd heated to 50 degrees Celsius. Let's check how to compose it correctly. Key findings: Briefly summarize your main results, but avoid going into detail. Restate your methods: In a sentence or so, how did you go about your experiment? Your equation should be correctly balanced, with your stoichiometric coefficients reduced. Here is a good order for your lab report: 1) Abstract - You'll write this summary of the experiment last, but put it first in your report. A hypothesis is not necessary for a laboratory exercise that only involves making observations of specimens or techniques. The main point is that this section provides a brief review of what your lab report is about and what you've managed to achieve.The introductory part tells your readers what to expect from the project. This could include key terms and definitions. 2) Conduct the Experimental Section. For example, individuals who go to college and obtain an education often earn higher incomes and enjoy a better lifestyle. Essentially, it explains what you did in the experiment and how it went. Are you undertaking a new area of research altogether? Be certain that you know, for example, how your teacher or professor wants citations and/or endnotes, whether he or she will require a list of materials, and exactly how a final lab report should be formatted.[4] Advertisement 1 Start with your title, personal, and class information.

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