

Write up for Scientific Practical

- 1. Title**
- 2. Hypothesis**
- 3. Method**
- 4. Results**
- 5. Conclusion**
- 6. Evaluation/ Methods of Improvement**
- 7. Reference/Bibliography**

Scientific Hypothesis

- Your science experiment hypothesis should be clear and be in the form of a question that you want to find the answer to.
- Ideally the question should have a yes or no answer. For example, in a chemistry practical the following hypothesis may apply: "Does vitamin C in orange juice oxidise over time when exposed to the air?"
- A clear and well written hypothesis can help point the way to what data you need to gather to help you find the answer. Once you know what data you need that helps in the experimental design.
- So as you can see the hypothesis is the foundation around which your report should be designed and built.
- From the science experimental data you obtain (if the experiment is well planned and carried out) you should be able to say if the hypothesis has been either supported or not in your conclusion section.

Method

- Your science practical method should include a list of the equipment, and the method used.
- As already mentioned above, try to write your method in the past tense (i.e. you are describing something you have already carried out) and avoid personal pronouns (I, we, you, he, she etc). As an example "Four test tubes were labelled 1 to 4" is better than "You will need to label four test tubes 1 to 4" or "We labelled four test tubes 1 to 4". This is quite tricky at first, but you get the hang of it once you have written a few reports.
- Your method must be detailed enough for others to follow and repeat your work if required but should NOT be written in a style as if it is a series of instructions for others. Again, quite tricky until you get the knack. The reproducibility of results by others is one of the cornerstones of the scientific method.

Science Experiment Results

- Your science experimental results section should be well presented and include your data in table and graphical form.
- Any calculations you used on your data including statistical tests if required should also be in this section.
- Presentation is everything and all graphs should have a title and all axis should be labelled.
- Do not scale your graphs so that they fill the entire page and but right up against the margin (a pet hate of mine).
- It is better to divide your scale by two and have a smaller half sized graph in the centre of the page.
- If you use this approach, you may be able to fit more than one graph per page allowing the reader to review your graphical data and spot trends more easily.
- If the graphs are on separate pages, then they have to flip back and forth between them.

- You need to choose the correct type of graph for the data you are presenting. A histogram is ideal for comparing two groups whilst a line graph is better for showing how enzyme activity varies with temperature.
- Determine the values that are going to go on the X and Y axis. If the values are continuous, they need to be evenly spaced based on the value. Eg, 1,2, 3..etc. Or 10, 20.etc. Or 5,10, 15.etc.
- Always aim for a line/curve of best fit, this line/curve should pass through most points, leaving equal numbers either side.
- You must resist the temptation to make any comments on your results in the results section. That is what the conclusion section is for.
- An experienced scientist will, by looking at the your results, be formulating their own conclusions based on your data and you should not influence your reader by including your own thoughts and comments here.
- Once the reader has reviewed your data and maybe come up with their own conclusion they can then move on to the conclusion section and see if your conclusion and theirs agree.

Science Coursework Conclusion

- This is where you review your data and state your opinions and arguments of what the results show AT LENGTH.
- A half page conclusion is not going to get you a good grade. You should quote the data in the results section in support of the scientific conclusion you are making.
- Such as "as can be seen by graph 3 there is a marked difference between group A and group B which allows the conclusion that" etc.
- You should state if the hypothesis has been supported or not.
- Your readers can then decide if they agree or disagree with your conclusions.
- This is the basis of scientific debate. If the data obtained is not sufficient to support or reject the hypothesis state, why and propose further work that will help to generate more data allowing you to be able to draw a firmer conclusion.

Science Report Evaluation/ Methods of Improvement

- You should include here sources of error that might affect the results.
- Remember a good scientist is always self-critical.
- If you have used measuring apparatus such as weighing scales for mass or glassware for measuring volumes, then you may need to calculate the percentage error of the measuring apparatus.
- The formula is the smallest graduation halved then divide that number by the volume or mass measured. Finally multiply by 100 to get a percentage.
- If you have used a pipette to measure 20cm³ of solution and the smallest graduations on the pipette are 0.1cm³ apart this means that the actual volume dispensed may be 0.05cm³ (which is $0.1 \div 2$) above or below 20cm³. The actual amount dispensed will be between 19.95cm³ and 20.05cm³.