

WRITING LAB REPORTS

This is a short guide to what should be in a lab report. For each section of the report you need to think about its function, where to get the material that goes into each part and the correct way to present it. You also need to keep in mind the overall appearance and readability.

TITLE

Function:

- The title should provide a prospective reader with sufficient information about the content of the report to recognize whether it is likely to be of interest to him/her.
- It is your first chance to inform the reader about your work, if you do not catch his/her attention you may not get another chance.

Sources:

- Examine the discussion section and look for a sentence that sums up what you think was most important about the work you are describing. The idea in that sentence should be reflected in the title.
- The title should clearly state what the reader can expect to find in the paper. This means that you will often need to mention the species used and some statement about the primary finding. Look at other papers on the same topic and see what kinds of titles they use.

Problems:

- The commonest problem is a title that is too general, i.e. 'Enzymes'. A title like this implies that the paper will deal with EVERY aspect of enzymes that is known.
- A second common error is that the title refers to a minor part of the work or to an irrelevant aspect. See 'Examples' for typical errors of this type.

Format:

- Although the title is usually only 15 words or so in length, you should be aware of certain conventions. These are not universal, but are a guide to common practice.
- The published version of a paper may capitalize most nouns, but your copy should only do so at the start of a sentence, for proper names and for genus.
- If the paper is one of a series there can be a running title followed by a subtitle. This can be set off with a colon, or given a Roman numeral. i.e. 'Flagella motility-defective mutants. IV Genetics and biochemical analysis.'

Examples:

Here is a short description of an experiment, with some good and bad titles to describe it.

The enzyme polyphenol oxidase is found in many plants as a protection against wounding. In this experiment the enzyme was extracted from both potatoes and apples. The reaction rate of both enzymes was examined at temperatures ranging from 0-25 degrees Celsius. Catechol was used as a substrate and the reaction was monitored by determined the change in absorbance at 595 nm. Both showed a linear increase of activity with increasing temperature, although the enzyme from the apple was consistently more active that that from the potato, when expressed on an activity per mg tissue basis.

Some possible titles might be:

Polyphenol oxidase activity in both potatoes and apples is temperature-dependent.

An investigation of the effect of temperature on the activity of polyphenol oxidase from potatoes and apples.

*Both of these provide the key result of the investigation, activity is related to temperature and mention the two sources of the enzyme.

Some problem titles might be

Polyphenol oxidase

* Too general, you are only looking at a very small aspect of what is known about the enzyme

Wound healing in potatoes and apples

* Largely irrelevant: although the enzyme may be used this way, that is not what the experiment was about.

Apples have more polyphenol oxidase than do potatoes.

* Again, not the main focus of the experiment.

Polyphenol oxidase attacks catechol in plants.

* This is not even correct and certainly has no bearing on the experiment in question.

INTRODUCTION

Function:

The introduction must provide the reader with enough background information that they can understand what is already known about the subject.

You should also provide the reader with a clear idea of what it is that you wanted to show or discover in the course of the experiments you are about to describe. It should also be clear how you think this new information would be important in understanding the field you are studying.

Sources:

In many cases you may start with lecture notes and your textbook as sources of information. It is important to realize that these are only a starting point, you should then read other books and journals to get more material. Remember that books are typically 5 years out of date. Remember to cite all sources: **failure to do so constitutes plagiarism!**

Review articles in the journals are often a good summary of what is known, and what the current ideas are.

Truly up-to-date results and ideas can only be found in the research journals, but these are often too specific for introductory level reports.

Use the internet to locate information

Problems:

The commonest problem is a failure to include enough background information. You **MUST** explain to the reader what the problem is, and how it arose. Be sure to give the right information; don't get sidetracked on irrelevant issues.

Another frequent error is to summarize the entire report, including results and discussion. These should be left for their appropriate places in the report.

In general use the past tense and passive voice (i.e. do not use I or we), except in cases where you explicitly refer to your own work.

Format:

* You should start with a general survey of the topic being investigated, including the history of the work done, and reviewing the major theories or ideas.

* The introduction should then focus on progressively more specialized and detailed descriptions, ending up with a piece of work that has left an unanswered question.

* The question is the one that you will now pose, and let the reader know that this is the point of the paper.

* Remember to provide references for the information given in the introduction.

Example:

Since a typical introduction may run for more than a page, no attempt is made to provide a complete example here.

1) Talk about the right thing. Before you start, decide what the real function of the experiment is. Your introduction should address this point, and avoid unrelated topics. Assume you are studying the effect of various conditions on the reaction rate of an enzyme which is important in one of the steps of photosynthesis. The main topic is that of enzyme kinetics, not photosynthesis. While you might include a short description of the role of this enzyme, and what photosynthesis is, you should concentrate on enzyme function and the factors that can affect it.

2) Assume ignorance on the part of the reader. Start with very general statements and become more specific as you continue. The example above might start with a brief definition of what enzymes are and general information on how they work. This could be followed by an analysis of factors that are likely to affect enzyme function, and why. Then you could mention the source and importance of this enzyme, and finally, describe what specific information you hope to learn from this experiment.

3) Statements of fact should be referenced, and in general, the broader the statement, the more the references. Common knowledge can be given without a reference (i.e. 'water is essential for survival of plants and animals'). Do not cite lecture notes, they are not published material and avoid relying solely on your textbook. Look for review articles in the library, a good source to start with is. Do not use footnotes or endnotes, a few journals do allow this form of referencing, but the vast majority do not. A typical reference would look like this:

Enzyme function is affected by a variety of factors, such as temperature, pH and ionic concentration (Smith, 1984; Jones and Green 1985, Brown et al., 1988).

The reference should contain the author's name(s), if there are just one or two, and the year of publication. If there are more than two authors, then give the name of the first one followed by et al. (Latin abbreviation for 'and others') and then the year of the publication.

Read the section on Bibliography to see how the references are listed at the end of the paper. Never cite a source that you have not read, it is considered a serious breach of ethics, equivalent to plagiarism.

MATERIALS AND METHODS

Function:

This section provides the reader with a concise but accurate description of what you did. If your actions differed from the instructions in the hand-out, put down what you did, rather than what was intended.

The information should be sufficient that the reader:

- 1) could reproduce the experiment and get the same results,
- 2) understands what you did well enough that there is no ambiguity as to how the results were obtained

Sources:

Since this section is a record of what you did, virtually all of the information will come from your own notes. For this reason it is essential that you keep a detailed and accurate, step-by-step, record of what you did throughout the exercise. In particular, keep track of anything that was done that differs from the original instructions.

In journals it is all right to merely refer to someone else's work for a description of the methods, but in a lab report you should include a complete account.

Problems:

The commonest mistake is to treat this section as if it were a hand-out to a class. Do not give orders, instead you should describe what was done.

Although the practice is not universal, most journals prefer you to use the past tense and passive voice.

Remember that the idea is that a reasonably intelligent reader should be able to duplicate your experiment. You must provide enough information to allow the critical details to be included. When using a spectrophotometer you should include the make and model. you **MUST** include the wavelengths used in the measurement.

Try to avoid petty details that are either not critical, or should be familiar to anyone reading the report. It is not necessary to tell the reader that the spectrophotometer was turned on, that can be taken for granted. In the same way, do not include details such as setting the machine to zero, assume that the reader knows about as much as you do on the operation of the spectrophotometer.

On the other hand, you should tell the readers what you used in the blank tube when setting the machine to 100% transmission. That is something they cannot know about unless you tell them.

Usually most people tend to include far too much in the Materials and methods section. As you write it, keep asking yourself whether the reader needs to know that particular piece of information.

Format:

State what was done, using the past tense and the passive voice (do not use I or we). Use complete sentences and paragraphs. Remember, this is not a lab hand-out that is giving instructions on what to do, rather it is a record of something already done.

Use subheadings to break the description up into individual topics. If you prepare chloroplasts and then test them for photosynthetic activity, describe the isolation under a subheading 'Isolation of chloroplasts' and the testing under another, 'Testing photosynthetic activity'.

Use tables to describe procedures that would be repetitive or too complex to describe in a sentence

Examples:

Below are examples of both poor and good descriptions of the same procedure, along with an explanation of what is wrong or right about them.

Poor:

Take a test-tube, making sure it is clean, and fill it with 5 mls of water. Take another tube and fill it with dilute dye.

Better:

One tube contained 5 mls distilled water, the other 5 mls of dye at 10 mg/ml.

Poor:

First we carefully weighed a mouse, being sure to subtract the weight of the cage. Next we put the mouse into the jar containing the dry food. Next we weighed another mouse and put him into another jar with moist food. We left them for two days, each in their own jar. Next we weighed the mouse that had dried food, and it weighed 34.345 grams. Next we weighed the mouse that had moist food and it weighed 37.426 grams.

Better:

Two mice were weighed. One was placed in a jar with dry food, the other in a jar with moist food. After two days the mice were reweighed.

RESULTS

Function:

This section provides the reader with a complete and accurate account of what happened in the experiment.

The Results section should not be concerned with WHY you got the results that you did, but simply report them.

The results you present must convince the reader that your conclusions are correct. Therefore it is important that you present them in such a way as to make the points you want stressed clear to the reader.

Sources:

Your experimental figures should be the only source of information in this section. You should not include work from earlier papers, nor should you include work done by other people in the class unless you explicitly inform the reader which parts of the information are your own.

In general ALL relevant results should be included, even if they do not agree with your expectations (maybe especially if they don't agree).

The data can be reworked, to show it in a different light, but it should NEVER be changed. Altering experimental data is probably the most serious thing you can do in science, and is the one act that will be guaranteed to get you a zero, or fired.

Problems:

Often the results are not shown to your best advantage. This part of the report has to provide the information to the reader that will convince him/her that your conclusions are correct. If the results are presented poorly, or in an unconvincing manner then you have failed in your purpose.

Often data can be summarized most effectively as a Table or a Figure. Try to avoid over-whelming the reader with pages of numbers, if the same information could be achieved with a single graph.

You must remember to provide a written account of the results, even if you show a Table or Figure.

Format:

There are two parts to the presentation of the results, and usually both should be present. First the results must be described in words and second they should be presented in the form of Tables or Graphs.

Before deciding whether a Table or Figure is needed, decide what it is that you want the reader to learn from your results. Once you have made that decision, it is usually easier to see how to present the data.

Often some sort of statistical analysis is needed, in order to clarify a relationship between two variables, or decide whether two sets of data are really the same, or different..

Examples:

You need to draw the reader's attention to the appropriate graphs and tables, and to be sure that their important features are recognized. You do not need to restate every point on the graph.

Poor:

In Graph 1 the reading for the potato rose 0.5 in the first minute it rose another 0.47 in the second minute and it rose 0.51 in the third minute. After that the rate was less, it rose 0.36 in the fourth minute, 0.21 in the fifth and 0.05 in the sixth. The apple showed a slower rate; it rose 0.2 in the first minute it rose another 0.17 in the second minute and it rose 0.21 in the third minute. After that the rate was less, it rose 0.06 in the fourth minute, 0.01 in the fifth and 0.01 in the sixth. '

Better:

As can be seen in Fig. 1, for both the potato and apple extracts, the rate of the reaction was linear for the first few minutes and then leveled off. In the initial, linear, portion the potato extract showed a rate more than twice that of the apple (0.05OD/min vs 0.02OD/min respectively.)

Poor:

The rate is highest at high temperatures.

Better:

The greatest rate (0.3 OD/min) was observed at the highest recorded temperature (Table 2).

Presenting data

Graphs:

Make the graph large enough to show the results clearly.

The axes should start at zero, unless there is a very good reason for choosing another value (i.e. there are negative numbers). Numeric values should be evenly spaced along the axis, unless you are deliberately using a non-linear scale, such as logarithmic. Only include as many decimal points as needed for clarity.

Set up the divisions so that there are a reasonable number and that they can be assigned simple values. i.e. if the largest X value is 4.38, then have the X axis run from 0 to 5 and marked at 1,2,3,4,5. Do not have the axis go to 4.4 and have

divisions at 1.1,2.2 etc. The labels should clearly show what kind of variable is being measured and what the units are.

Note that the X (horizontal) axis is the one that YOU control, in this case at what times you took the readings. The Y (vertical) axis contains the values that you are interested in and are not under your direct control.

The title should provide the reader with enough details that the meaning of the graph is clear. This may include some information on the experimental methods and statistical analysis. Do not use the title to interpret the results, though you can draw the readers' attention to a particular outcome. The legend, which may be included in the title, must clearly identify which data points belong to each of the control or experimental procedures.

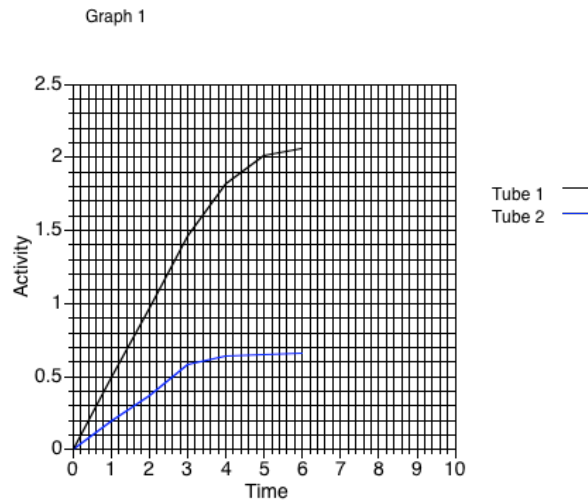
Do not use terms like 'Tube 1', the reader should not have to go back and see what is in tube 1. Instead use terms like '0.4 mls enzyme' or 'green light', that immediately inform the reader what variable is being examined. The graph itself should have data points that are large enough to be clear. Different data sets should use markers that are not likely to be confused.

Avoid hand-drawn lines. A straight line may be simply a best estimate, but it is better to use a statistically calculated line where possible.

Avoid putting too many data sets on a single graph, the reader will quickly lose track of which set to look at. On the other hand avoid splitting related data into two graphs. If you plan to compare two sets of information directly, then they should appear on the same graph.

See the following examples for a poorly presented graph, and one that is better.

Poor



Better

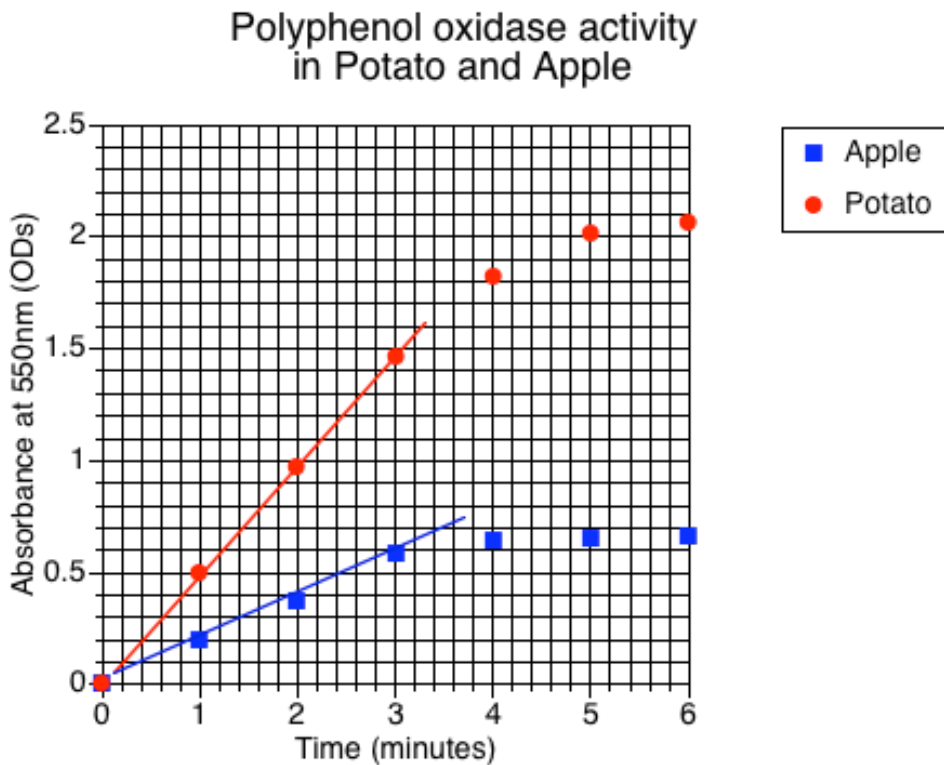


Fig.1 Soluble extracts from both apple and potato were tested for polyphenol oxidase activity by using 0.1M catechol as a substrate and measuring the change in OD at 550nm. Initial velocities were estimated to be 0.49 OD/min for the potato and 0.19 OD/min for the apple.

Tables:

The title should provide the reader with enough details that the meaning of the Table is clear. This may include some information on the experimental methods and statistical analysis.

Do not use the title to interpret the results, though you can draw the readers' attention to a particular outcome. The labels should clearly show what kind of variable is being measured and what the units are. By including the units in the label, you do not have to include them with each measurement.

DISCUSSION

Function:

This is probably the most important part of the report, and therefore you should spend a considerable amount of time thinking about it before you start writing. Here you analyze the results and try to explain what they mean. This can involve two separate processes.

First, you need to go beyond simply describing what happened, you should have already done that in the Results section. This section should point out trends, explain discrepancies and inform the reader what you think happened and why.

Second, the results should be referred back to the Introduction. Do the results agree with what is already known, which you talked about in the Introduction? Do the results answer the question you posed at the end of the Introduction?

Sources:

This section is a synthesis of the information described in the Introduction, the Results and your own ideas. As such, it will draw on all three sources of information for the appropriate material.

You can introduce new information from outside sources to support your arguments. Remember that these sources must be cited in the same way as those used in the Introduction.

Problems:

The Discussion is NOT a place to simply repeat the Results, nor should you go through the results one at a time and explain each independently. The Discussion should bring together all of the results to try and find a common theme or idea.

Unexpected results should be treated carefully. Although you may feel that strange results are always due to obvious causes (you goofed, the lab hand-out was misleading, your lab partner is brain-dead), look at them again. Did any other group see similar results? Was there anything about the experiment that might have differed from the stated procedure? Remember, some of the greatest discoveries in biology have come from looking into 'wrong' results.

Be prepared to analyze results critically: some use of statistics is useful. Distinguish between results that are meaningful and those that are simply random variation.

Most lab exercises are designed to help you understand a specific concept that is important to living organisms. Try to understand what is fundamental to all the experiments in this exercise, what do they have in common?

A major failure in many discussions is to leave out the most important part - "What does all this mean to living organisms?"

Format:

For the first time you can use the first person, in those parts of the discussion in which you voice an opinion. You are going to be describing how you interpret the results.

Start by reminding the reader of what you said in the Introduction, what results were expected and why.

Show how the results that you obtained did, or did not, agree with your expectations. Try to show the common links between all parts of the results.

Provide explanations for what you saw, both expected and unexpected.

What do the results show in terms of a general principle? How is this important to living organisms? What other questions do your results raise and what additional experiments might be done next?

Examples:

Because the discussion is lengthy and depends on both the Introduction and the Results sections, it is not possible to present a complete, detailed set of examples.

Keep the following points in mind:

- 1) Tell the reader what you expected to find, in general terms. This may be a summary of the information that you presented in the Introduction. You do not have to predict the outcome of each experiment, simply say what types of results should be likely.
- 2) Analyze specific results in light of your expectations. If many sets of data all show the same pattern, then you can deal with one in detail and state that the others are similar. If results do not meet expectations then try to provide a reasonable explanation. Do not assume that unexpected results are automatically your fault, see if some other factor(s) might be responsible.
- 3) Look for underlying principles between different experiments. Instead of analyzing each experiment in isolation, try to link all the results into a common idea.
- 4) Relate the results and ideas to living organisms. What biological principles do these results demonstrate and how could these principles be applied to organisms and their relationship with their environment?
- 5) Do the results leave unanswered questions? What types of further experiments might be done?
- 6) Have you analyzed the data using appropriate statistical methods?

BIBLIOGRAPHY

Function:

The Bibliography assembles all of the references cited by you in one place.

All of the references should be arranged in a manner that allows the readers to find the specific citation they want quickly.

The references may be used by the reader to learn more about the topic in question, or to check whether you have presented the work of others in a fair and accurate manner.

In time you will find that your Bibliographies will provide you with a valuable resource of your own, a record of where to find information on a series of topics that you have researched in previous reports. Bibliography, Sources:

The only items present in the Bibliography should be those that you have cited in the text of the report, **and which you have read.**

There are two exceptions, but these are not commonly used:

If you are unable to find the original version of a paper, but it is referred to in another paper (XYZ) that you have read, then you can include a reference as 'cited in XYZ'. This is rarely permitted unless the original is a rare paper, or in an obscure language.

If you have been told something by another scientist, but the work has not been published, then you can cite a 'personal communication', but you must have the written permission of the person involved.

Problems:

Common errors are:

Failing to include all references given in the paper.

Including references not cited in the paper.

Errors in referencing, wrong year, page number, wrong journal etc.

Rewriting the reference to make life easier for yourself. This often involves giving a shorter version of a very long title, or providing a reference that does not contain enough information for the reader to find it.

Format:

Although different journals use different formats, we will stick to a uniform type of citation. Keep all citations in alphabetical order by the last name of the first author. If there are several references by the same author(s) then list the references chronologically.

For journals, use the following format:

LastName1, Initials and Initials LastName2 (Year) Title. Volume: Pages

Smith, A.B and X.Y.Z. Jones (1988) Structure of ZDNA, as revealed by X-ray diffraction analysis. *Genetics*: 44: 234-237

If there are additional authors, then separate them with commas

White, A., G.U. Brown, Y.I. Black and F.I. Green

Always include the full year 1989, not 89

The title must be copied as it appears in the journal. The only exception is that words that are capitalized, and are not proper name, can be started with a lower case.

Journal names are typically in italics. If the name is a single word, then give the entire name. If the name is longer, then it is possible to abbreviate. Each journal has its own abbreviation: you can usually find what this is for the journal in question by looking at references in published papers. You will find that some rules generally hold true; Journal ->J., Biology->Biol., General->Gen. .

Books follow a different protocol:

The name(s) are presented as before, with one major exception. If the person(s) on the cover is (are) editors, rather than the writers, then the name(s) must be followed by (ed) or (eds). This is followed by Year, Title, Publishing firm and City of publication.

Jones, R.A. (1978) Protein function. Academic Press, New York

Lacy, G. and F.I. Haines (eds) (1988) DNA sequencing made easy. Jones Publishing Corp. Inc., Boston

If the book is an edited volume and you wish to draw attention to a specific chapter then cite the author of the chapter. You may also indicate the specific pages of interest:

Lord, R.O. (1988) in DNA sequencing made easy. Lacy, G. and F.I. Haines (eds) Jones Publishing Corp. Inc., Boston pp34-56

If the title is not in English, it must be presented in the language in which it was written. The exception to this is if the language uses a different script, such as Russian or Japanese, in which case an English translation of the title may be used.

Examples:

Adair, W.S., S.A. Steinmetz, D.M. Mattson, U.W. Goodenough and J.E. Heuser (1987) Nucleated assembly of *Chlamydomonas* cell walls. *J. Cell Biol.* 105: 2373-2382

Bloodgood, R.A. (1981) Flagella-dependent gliding motility in *Chlamydomonas* *Genetics* 106: 183-192

Galvan, F., L.C. Romero and A.J. Marquez (1987) 38 Metalloproteins Involved in the inorganic nitrogen metabolism of *Chlamydomonas* and other green algae. in "Inorganic Nitrogen Metabolism " Ulrich *et al.* eds Springer-Verlag, Berlin pp195-197

Using the Internet

The Internet is a great source of information, and should be one of the first places you look for sources. Start with <http://scholar.google.com/> or <http://www.scirus.com/srsapp/> as places to find reliable scientific information. However, web pages are NOT usable as citable sources except in a few cases. The reason for this is that there is no guarantee that the site will still be there later on.

If the site is run by a scientific society, or by one of the standard journals, then you may use it to cite a publication that they carry.

If the page has the actual text of an article published elsewhere you can use it. You still need to cite the original article.

When it is necessary to cite a web page, give the full URL and the date that you found it. If in doubt you can always download the entire page to your hard drive and keep it as a reference.

Plagiarism

Be sure that you are familiar with the University policy on plagiarism, as outlined in the student handbook. Also, see the library web site for more information:

<http://library.easternct.edu/library1/plagiarism/plagiarism.htm>

Note: in addition to the information on these sites you should be aware that citing a paper you have not read is also considered plagiarism. **Be prepared to show at least the first page of every article/book that you cite**

For overseas students, the following site offers advice on writing well in English
<http://www.utoronto.ca/writing/advise.html#esl>

REVISING YOUR INITIAL DRAFT

It is very unlikely that your first draft will be perfect. One of the signs of a good writer is that s/he will review and revise all of their writing as a matter of routine.

The whole purpose of the report is for the READER to understand what you have done. It is of no value if YOU can understand your report but the reader cannot.

Always try to see your writing from the reader's point of view.

Go over each sentence in the report and ask the following questions.

Content

- Does this sentence simply repeat what the previous sentence said?
- Would the report have the same meaning if you removed this sentence entirely?
- Is the sentence padded out, or filled with irrelevant material?

If the answer to any of these questions is YES, then you can probably remove the sentence altogether.

Clarity

- Does the sentence only make sense if you read it out loud and use pauses, hand gestures or change in tone?
- Is the meaning of the sentence unambiguous? YOU may know how to interpret what it says, but will the reader?
- Does the sentence use words like 'it' or 'they' that refer back to something in an earlier sentence?
- Do the verbs used apply to the wrong nouns?

If the answer to any of these questions is YES, then you should rewrite the sentence to eliminate any ambiguity

Completeness

- Does this sentence contain incomplete information, such as 'many' rather than specifying the actual number?
- Do you use a lot of 'etc' or 'and so on' type of phrases, rather than giving examples?
- Have you introduced new facts or ideas without specifying the source?

If the answer to any of these questions is YES, then you need to include any additional material needed to remedy the problem.

Simplicity

- Does this sentence simply repeat what the previous sentence said?
- Would the sentence have the same meaning if you removed specific words or phrases?
- Is the sentence padded out or filled with irrelevant material?
- Are you using empty phrases such as 'It might be profitable to speculate on the...!', rather than just saying what you think?

If the answer to any of these questions is YES, then you can probably remove large portions of the sentence. This will usually make the meaning of the sentence clearer to the reader.

NOTE!!!

Passive vs Active voice:

Some books recommend use of the active voice as a way of making a report more concise. However, because most journals still require authors to use the passive voice, we will continue to require the use of the passive voice in all reports.

Flow

- Is the relationship between this part of the report and the previous parts obvious?
- Are you linking related sentences or ideas with phrases that show the reader what you are doing?
- Are you keeping related material together, rather than splitting it between different sentences and paragraphs?

If the answer to any of these questions is NO, then you may need to provide the reader with a clearer idea of what you are doing. If necessary, spell out the sequence of ideas that you will present up front. Then, as you go through the sequence, at each step inform the reader where you are in the sequence.

Teleology

- Does this sentence suggest that a molecule, cell or organism is acting in a conscious, directed, manner?
- Does the sentence imply that organisms plan their own evolution?

If the answer to any of these questions is YES, then you should rewrite the sentence. Remember that although evolution can result in structures or organisms that are

adapted to an environment, it is the result of selection, not due to intent on the part of the organism.

Spelling/Grammar

Always use the spelling checker in the word-processing program.

- If you have ANY doubts, look the word up
- Pay particular care to scientific terms and names. Remember, taxonomic names should be in italics.

Use a standard style manual that provides examples of accepted usage

- Poorly written reports will lose points not just because of the quality of writing as such, but because it almost certainly will be mis-read.
- Remember, most employers rank writing ability as the second most important skill they look for when hiring.

THE ABSOLUTE BOTTOM LINE

The reader must learn four things from your report

- Why did you do this experiment?
- How did you do the experiment?
- What did you learn from the experiment?
- What do you think it means?

All four must be stated clearly and unambiguously in the appropriate part of your report. If you fail in any part of this, then the value of the report drops precipitously.

FINAL CHECK

Is the title sufficiently descriptive that the reader can immediately understand the main importance of the report?

Does the Introduction provide enough background material to show the reader why the experiment was done? Are sources of information provided? Unless the reader understands WHY you are doing the experiments, none of the rest of the report will make much sense. You must provide the background material needed for this understanding.

Are the Materials and Methods complete, accurate and concise? Failure to provide proper Materials and Methods may lead to a complete misunderstanding of what you did, and therefore an erroneous interpretation of the results.

Are the Results presented clearly? Are all Graphs and Tables in the right format? It is important that you follow the accepted conventions on presenting Table and Graphs. This ensures that the reader interprets them correctly.

Does the Discussion relate the results you obtained with what was described in the Introduction? Remember that the Discussion is the most important part of the report. This is where you link the Introduction and Results to each other, and come up with an overall statement about the experiment.

Have you demonstrated any underlying principles and how these might be important to living organisms? Try to see what principles were demonstrated by the experiments. Look at the entire set, rather than one at a time. Do they have any common theme that might be important for living organisms?

Is the Bibliography complete and accurate? The Bibliography should contain every piece of work you mention in the report, but no others. The format must conform to the proper usage.

Have you revised the report for spelling, grammar, clarity and meaning? Poorly written and misspelled documents are always going to get lower grades. Take time to take care of these problems or they may ruin what was otherwise a good report.

Have you written for the reader, rather than for yourself? If you cannot get the reader to appreciate and understand what you have done then all the work you did in the laboratory was wasted. A report is to tell the rest of the world what you did, until that happens the work has no meaning.