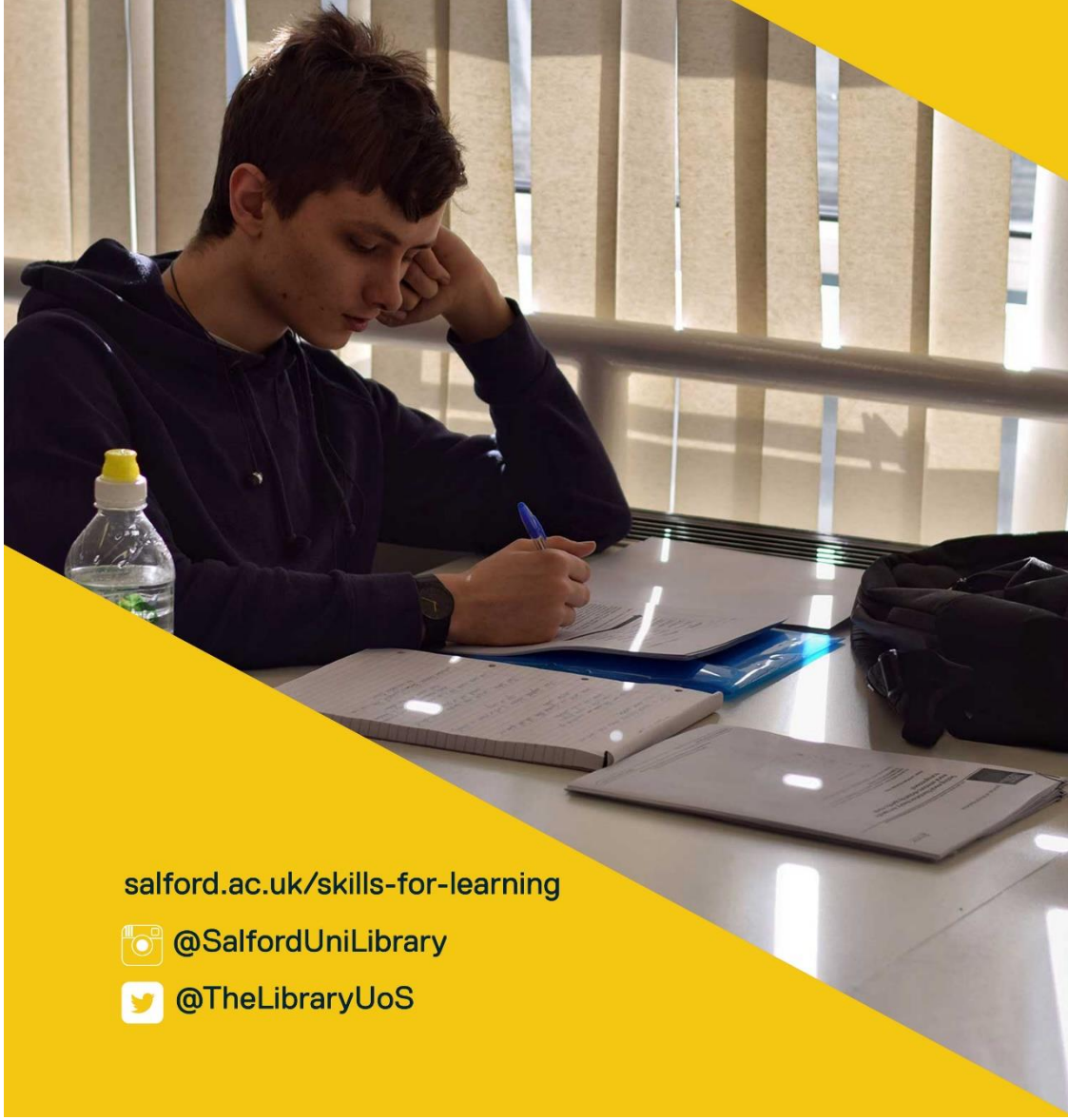




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# Scientific Writing Skills



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# Introduction

Writing for scientific purposes calls for precision, clarity and a logical approach. To be able to write effectively you must be able to anticipate the needs of the reader and be able to make what can be a complex area easy to understand.

# Scientific Writing Style

## Short, clear sentences

In common with other types of academic writing it is important that you use short, clear sentences in a concise and formal style. For that reason it is not acceptable to use contractions such as 'don't', 'won't' and 'they're'.

Make sure that the information is clearly organised using a structured layout and that the ideas are presented in a logical order. Avoid using jargon and acronyms where possible

## Precision

Scientific writing must be accurate so it is inappropriate to say 'about' or 'approximately', far better to quantify using SI units and the appropriate abbreviations. Students sometimes use the wrong abbreviations for SI units and use upper case rather than lower case which can give a completely different meaning.

Correct use of upper case and lower case letters: it really does matter!

Length:	metre (m)
	millimetre (mm)
	micrometre ( $\mu\text{m}$ )
Concentration:	molarity (M)
	millimolar (mM)
	micromolar ( $\mu\text{M}$ )

**Rather than:**            There was a high wind that  
blew for several hours

**Write:**                    The wind blew at Beaufort 8 for  
3 hours

Aim to convey the meaning in as few words as possible. Otherwise it may appear that you are waffling or not very clear about the point that you wish to make.

## Latin words for species names

Be careful to write Latin words such as species names in italics, for example: *Escherichia coli* or *in vitro*.

## Examples of phrases that can be shortened:

<b>Avoid</b>	<b>Better</b>
A considerable number of	Many
An adequate amount of	Enough
An example of this is the fact that	For example
As a consequence	Because
Considerable amount of	Much

(Hofmann, 2010)

## An academic argument

Academic writing often requires you to develop an argument and express an opinion about issues.

Essay questions often include words such as 'evaluate' or 'critically analyse' because lecturers want you to weigh up the pros and cons of those

theories proposed by others and they want to know what your conclusion is. Often students fail to reach a conclusion and the lecturer is unsure of your viewpoint.

Put forward your point of view by presenting it in a clear, logical way so you are gradually building your case. Make sure that you have evidence to support your reasoning and that this evidence is credible i.e. is published by an authority in the field, not just anecdotal.

## Objective viewpoint rather than subjective

In academic writing, it is important that you put forward your argument in an objective manner; the reader sees you as the person who is evaluating and reporting the facts. As such it is inappropriate to say 'I feel', 'I think' or 'we deduced'. Use words or phrases that underline the use of evidence:

### **Rather than...**

I think

I feel

I agree

### **Say...**

From examining the findings...

In light of the evidence...

It is evident from the data that...

Another way of emphasising objectivity is to use the passive voice rather than the active voice as it depersonalises the writing. Essentially, the action, rather than the person, takes precedence.

### **Example:**

**Passive** – The test tube was filled by the research officer

**Active** – The research officer filled the test tube

**However** always sense check your writing to make sure that you have expressed yourself as clearly as possible, sometimes over-use of the passive voice can become clumsy and cause confusion.

### Use of tense

Scientific writing frequently uses the past tense, this is particularly appropriate for describing activities such as experiments. However, sometimes you may need to use different tenses according to what you are saying. When referring to an author it is better to say 'Mills (1999) claims that' rather than 'Mills (1999) claimed that' because that implies that your research is more current. Also, use the future tense when discussing what further investigations might need to be carried out.



## Avoidance of accusations of plagiarism

When using evidence to support your argument, it is important to cite and reference your sources.

Failure to do so may lead to accusations of plagiarism. There are only two acceptable ways of doing this:

- Using direct quotations.
- Paraphrasing.

When paraphrasing you need to ensure that you:

1. Avoid using the same words or phrases as in the original text.
2. Maintain the gist of what is being said.
3. It may be possible to change the structure of the original sentence(s). So maybe consider making two short sentences into one, or one long sentence into two shorter ones.

**Remember that direct quotations are not appropriate in scientific writing and must not be used!**

## The use of Figures and Tables in scientific writing

Students often underestimate the attention that should be paid to the use of Figures and Tables in scientific writing. These often 'tell the story' most effectively, but can only do so if they are labelled correctly and consistently and if they are formatted in such a way as to provide accurate information.

**Example:** labelling a figure:

Figure legend goes at  
foot of image

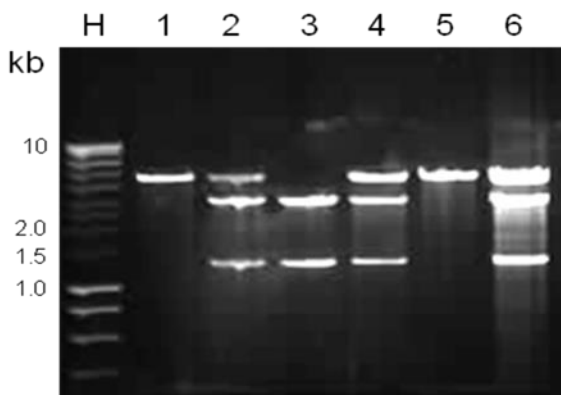


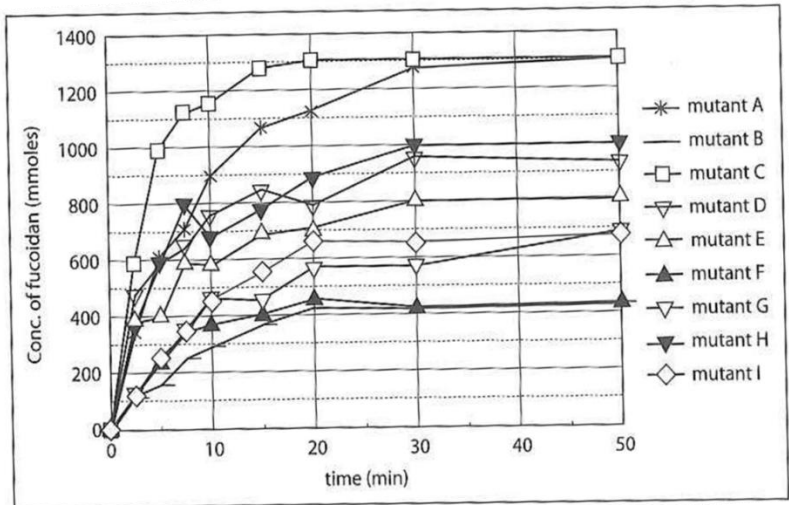
Figure 1. Agarose Gel Electrophoresis of.....

**Example:** labelling a table:

Table 1: Volumes and final concentrations of RNA samples used in the first strand synthesis reactions

Cell line Sample	Volume of RNA used in cDNA synthesis (ul)	Final amount of RNA used (ug)
MOLT-4 sample 1	3.8	0.8
MOLT-4 sample 2	3.5	0.8
NALM-6 sample 1	1.8	1
NALM-6 sample 2	1.9	1
K562 sample 1	1.3	1
K562 sample 2	1.4	1

Always consider how easy or difficult it is to read the graph. The following graph appears difficult to read as there are too many overlapping lines.



(Hofmann, 2010)

Reference list

Hofmann, A.H. (2010). *Scientific Writing and Communication*. Oxford: Oxford University Press.

Lindsay, D. (2010). *Scientific Writing: Thinking in Words*. Retrieved from <http://www.EBSCOhost.com>.

Matthews, J.R. & Matthews, R.W. (2008). *Successful Scientific Writing* (3rd ed.). Cambridge: Cambridge University Press.

University of Leicester Learning Development Unit. (2009). Writing for Science. Retrieved 13 February 2014 from [www.le.ac.uk/succeedinyourstudies](http://www.le.ac.uk/succeedinyourstudies)

Other Study Basics guides which you may find useful:

Study Basics Poster Presentations

Study Basics Scientific Report Writing

Study Basics Writing a Scientific Paper

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