

M.Sc CHEMISTRY-II

UNIT-5

THESIS AND ASSIGNMENT WRITING

BY

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CONVENTIONS OF THESIS WRITING

An effective thesis statement states the purpose of the paper and, therefore, functions to control, assert, and structure your entire argument. Without a sound thesis stated clearly at the beginning of your paper, your writing will sound unfocused, and uninteresting to the reader.

Conventions

- **Demonstrating expertise and objectivity**
- **Writing clearly**
- **Writing concisely**
- **Writing accurately and precisely**
- **A note on referencing**

General format

- **The main sections of a standard report are as follows.**
- **Title.** If the report is short, the front cover can include any information that you feel is necessary, such as the author(s) and the date prepared. ...
- **Summary.** ...
- **Introduction.** ...
- **Body.** ...
- **Discussion.** ...
- **Conclusion.** ...
- **Recommendations.** ...
- **Appendices**

General format

- **step1**
- **Choose some basic formats, then use them for everything:**
 - **A common 10 or 12 point font (Times New Roman is good).**
 - **Margins: 1.5 inches on the left, 1 inch each for top, bottom and right.**
 - **Paragraphs for chapters: double-spaced, first line indented 0.5 inch, widow and orphan protection on (required), no hyphenation (recommended); left-justified or full-justified.**
 - **Block quotes: indent the left margin of your paragraph.**

step2

Use the Spelling checker. Add technical words for your discipline to its dictionary.

Step 3

All tables and figures must fit within the required margins. If some don't, you will have to rotate them or place them on landscape-oriented pages.

Step 4

Ask the Office of Degree Requirements questions early if you aren't sure how to handle something.

- Use styles to make your headings within chapters consistent.
- The Bibliography must be single-spaced with a blank line between entries. Use MS Word to keep each entry on the same page, as required.

Some things to avoid:

- Do not attempt to put dots in a list by pressing the period key repeatedly. Use “leading dots”: set a tab stop and under Leader choose option #2.
- Do not attempt to line things up by pressing the tab key repeatedly. Set a tab stop where you want it.

- **Don't type your Table of Contents yourself. Word can create a Table of Contents based on the Heading styles.**
- **Follow the instructions in the IT tutorials for managing different types of page numbers in one document.**

Chapter format

- Describe the five major chapters of a thesis. Your description should also include the value and purpose for each chapter. The five major chapters of a thesis are: the introduction, review of related literature, design and methodology, findings, and conclusion (College of Education Masters Committee). Apr 13, 2010

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Footnotes, Endnotes, headnotes

- In academic writing, footnotes, endnotes, and headnotes provide additional information on a particular topic. They are placed in the document as a supplement to the main text. These notes can be inserted into the document as a footer or at the end of a chapter.
- The notes should be kept as brief as possible. The objective is to provide more information without distracting the reader. We discuss the different types of notes, how to use them, and their pros and cons.

Footnote

- A footnote is a reference placed at the bottom of a page or footer. When writing your research paper, you would use a footnote to cite sources of facts or quotations. Footnotes are referenced in the text in the same way as a citation. That is, the referenced text is followed by a superscript numeral, which corresponds to the numbered footnote at the bottom of the page.

- The two types of footnotes are:
- *Content*: Supplements or simplifies substantive information; not detailed.
- *Copyright permission*: Cites quoted text and any reprinted materials used in the text.

- The format of footnotes is fairly standard (see below for specific rules) and is the same as that for references as follows:

Adrian Johns. The Nature of the Book: Print and Knowledge in the Making (Chicago: University of Chicago Press, 1998), 623.

- When citing the same reference again, the footnote can be shortened as follows:

Johns. Nature of the Book, 384–85.

- Some older journals use “*ibid*” instead of a shortened version of the reference. *Ibid* is short for the Latin “*ibidem*”, which means “in the same place.” This format was previously used in most printed text but rarely used now.

Endnotes

- Endnotes are much the same as footnotes except that they are placed at the end your research paper instead of at the bottom of a page. In books, they can be placed after each chapter or at the end of the book.
- In many cases, the book publisher decides the best placement. Endnotes, as footnotes, are numerically noted in superscript. The format is the same as that for footnotes.



Headnotes

- Headnotes are used as introductions in legal documents or as summaries of the text that follows them. In academic writing, headnotes are explanatory notes included with tables and figures. They are placed below the table itself or just below the figure title and typed in a font size that is smaller than the main text (e.g., 8- or 10-point font). Headnotes are used to define acronyms used, units of measure, significance, etc. Because tables and figures should be able to “stand alone” without the main text, headnotes should always be used.

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Format for Footnotes, Endnotes, and Headnotes

- Although the format for footnotes and endnotes is almost similar, there are specific rules depending on the journal where the paper is submitted. Most scientific journals use specific reference formats; however, some style guides do not allow footnotes and endnotes.
- For example, the Modern Language Association (MLA), which deals specifically with disciplines in the humanities allows limited use of footnotes. These are to provide the reader with other sources for more information on the subject covered. The [MLA style for these notes](#) is shown in the example below and the number corresponds to the superscript number noted in the referenced text:
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See [name of author], especially chapters 3 and 4, for an insightful analysis of this trend.

MLA suggests using “content” footnotes when necessary to avoid interrupting the text with an explanation or other details.

In contrast, the American Psychological Association (APA), the style for the behavioral and social sciences, does not usually allow footnotes. Your particular journal guidelines will provide that information.

A third style guide, the [American Medical Association \(AMA\)](#), is used mostly with papers in the biological and medical sciences. AMA also discourages the use of footnotes but allows them on the title page. The information on the title page would include the authors’ names and affiliations, corresponding author, members of affiliated groups, etc.

Pros and Cons

- Scientific papers do not usually include footnotes. Endnotes may be used sometimes, but sparingly. Other disciplines, such as law and history, still [use them regularly](#). There are pros and cons to each.
- The advantages of using footnotes are that they provide the reader with a fast reference and link to additional information. They are easy to insert and will automatically print. The advantage of using endnotes instead of footnotes is that their placement is less distracting. They also provide the reader with an easy reference list in one place.



- According to the Chicago Manual of Style (CMOS), endnotes are preferred to footnotes simply because they don't clutter up a page. CMOS does caution that it can seem disconcerting to a reader to see pages of notes at the end of a chapter or book, so use them sparingly.
- Again, another disadvantage to footnotes is that they tend to interrupt the flow of the text. The reader might feel that he must stop and look at the note before moving on, which can be very distracting. Some disadvantages to endnotes are that the reader must turn to the end of the text or chapter to find the additional information. In books with several chapters, this can be tedious, especially if the endnotes are renumbered in each chapter.
- As for headnotes, there are really no drawbacks to using them in tables and figures. They offer the reader helpful information that is readily available as they read the data or interpret a figure.

Bottom Line

- The style to which you conform when writing your paper will ultimately depend on the journal's guidelines. Pay careful attention to its protocols for citations and references and whether it will allow footnotes and endnotes. If allowed, be mindful of the disadvantages of both and consider either greatly limiting them or eliminating them altogether.

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Tables and figures

- Figures and tables (display items) are often the quickest way to **communicate large amounts of complex information** that would be complicated to explain in text.
- **Many readers will only look at your display items** without reading the main text of your manuscript. Therefore, ensure your display items can stand alone from the text and communicate clearly your most significant results.
- Display items are also important for **attracting readers** to your work. Well designed and attractive display items will hold the interest of readers, compel them to take time to understand a figure and can even entice them to read your full manuscript.
- Finally, high-quality display items give your work a **professional appearance**. Readers will assume that a professional-looking manuscript contains good quality science. Thus readers may be more likely to trust your results and your interpretation of those results.

- When deciding which of your results to present as display items consider the following questions:
- Are there any data that readers might rather see as a display item rather than text?
- Do your figures supplement the text and not just repeat what you have already stated?
- Have you put data into a table that could easily be explained in the text such as simple statistics or p values?
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Tables

- Tables are a concise and effective way to present large amounts of data. You should design them carefully so that you clearly communicate your results to busy researchers.
- The following is an example of a well-designed table:
- Clear and concise legend/caption
- Data divided into categories for clarity
- Sufficient spacing between columns and rows
- Units are provided
- Font type and size are legible

Table 2 Ecological footprint ledger of the energy resources in Zhifanggou watershed before and after grain for green policy

	Energy	Total consumption (t)	Convert coefficient (GJ t ⁻¹)	Consumption per capita (GJ cap ⁻¹)	Global average (GJ hm ⁻²)	Ecological footprint per capita (hm ² cap ⁻¹)	Biological productivity area
Before grain for green policy	Coal	0.250	20.934	0.010	55	0.0002	Energy land
	Petrol	2.050	43.124	0.169	93	0.0018	Energy land
	Diesel	9.230	42.705	0.753	93	0.0081	Energy land
	Electricity	0.002	0.004	12.000	1000	0.0120	Built-up land
After grain for green policy	Coal	0.246	20.934	0.010	55	0.0002	Energy land
	Petrol	2.705	43.124	0.227	93	0.0024	Energy land
	Diesel	7.740	42.705	0.643	93	0.0069	Energy land
	Electricity	0.002 ^a	0.004 ^b	12.000	1000	0.0120	Built-up land

The conversion of electricity referenced the related standard of energy conversion. 1 wh = 3,600 J

^a The unit was kWh

^b The unit was GJ/kWh

- Figures are ideal for presenting:
- Images
- Data plots
- Maps
- Schematics
- Just like tables all figures need to have a clear and concise legend caption to accompany them.

Images

- Images help readers visualize the information you are trying to convey. Often, it is difficult to be sufficiently descriptive using words. Images can help in achieving the accuracy needed for a scientific manuscript. For example, it may not be enough to say, “The surface had nanometer scale features.” In this case, it would be ideal to provide a microscope image.
- For images, be sure to:
 - Include scale bars
 - Consider labeling important items
 - Indicate the meaning of different colours and symbols used

- **Data plots**

Data plots convey large quantities of data quickly. The goal is often to show a functional or statistical relationship between two or more items. However, details about the individual data points are often omitted to place emphasis on the relationship that is shown by the collection of points. Here, we have examples of figures combining images and a plots in multiple panels.

For data plots, be sure to:

- Label all axes
- Specify units for quantities
- Label all curves and data sets
- Use a legible font size
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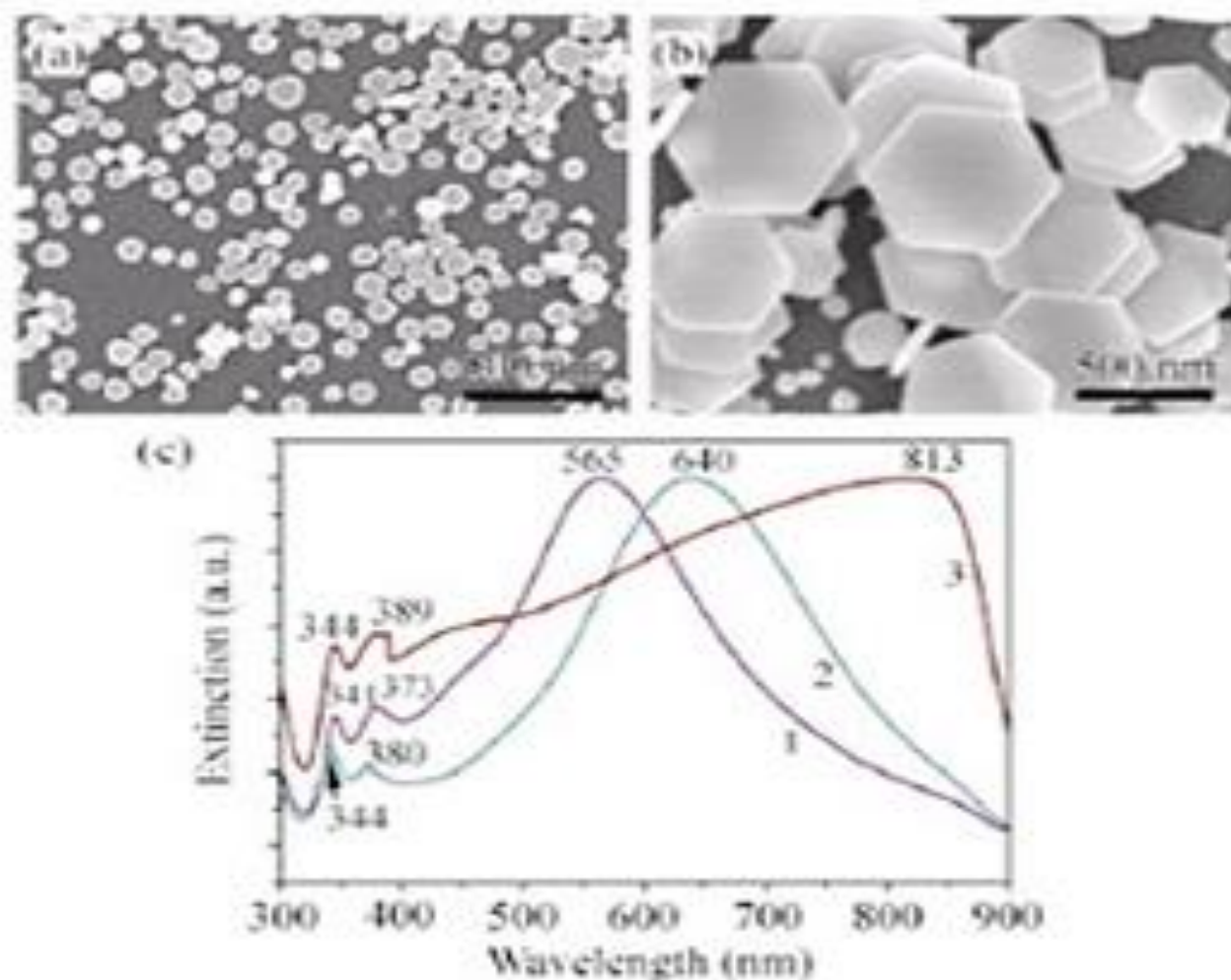


Figure 2 FESEM images of Ag HNPs with different edge lengths: (a) 40 nm; (b) 60–350 nm; (c) UV-vis spectra of Ag HNPs where curves 1, 2, and 3 correspond to nanoplates with edge lengths of 40, 60 and 60–350 nm

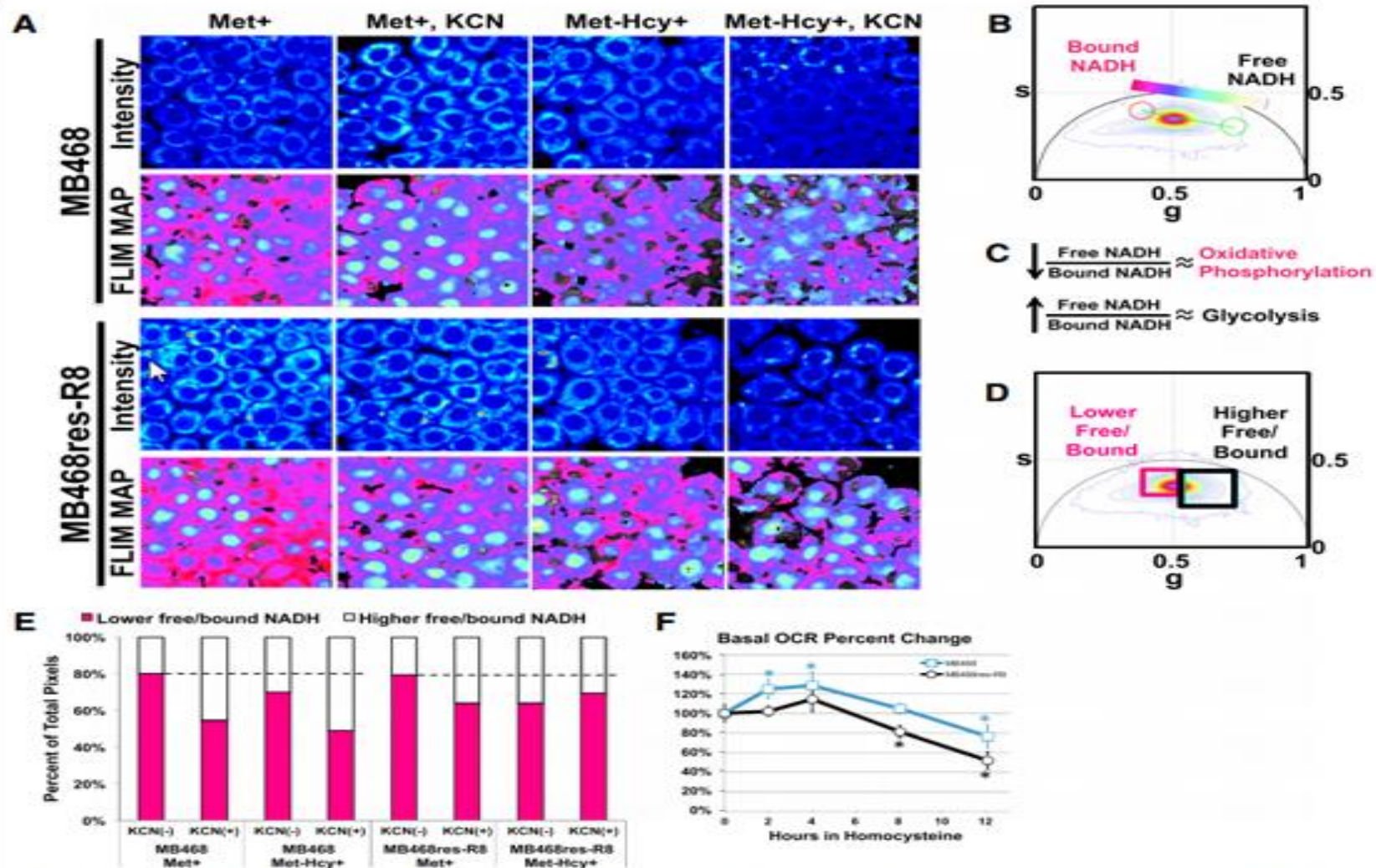


Fig. 2 Homocysteine media induces a metabolic shift from oxidative phosphorylation to glycolysis. **a** MB468 and MB468res-R8 cells cultured in Met+ or Met-Hcy+ growth media for 48 h with or without 4 mM KCN were imaged using two-photon microscopy at 740 nm. NADH free/bound fluorescence lifetime imaging microscopy (FLIM) maps of cells are shown using the color spectrum in the FLIM phasor histogram (**b**). **c** The phasor histogram represents relative fractions of free NADH (cyan-white) and protein-bound NADH (red-purple). **d** Cluster analysis using the phasor histogram to separate signals of high free/bound (black square) and low free/bound (pink square) NADH ratios. **e** Quantitation of NADH ratios from cells in **a** is shown. Two fields for each sample with a minimum of 15 cells per field were analyzed by cluster analysis and normalized to total pixels measured. The black dotted line indicates the average percentage of lower free/bound NADH ratios of MB468 (80%) and MB468res-R8 (79%) cells cultured in in Met+, KCN(-). **f** MB468 and MB468res-R8 cells cultured in Met+ media for 12 h or Met-Hcy+ media for 2, 4, 8, and 12 h were analyzed by Seahorse Bioscience XF analyzer. MB468 (blue line with squares) and MB468res-R8 (black line with circles) basal oxygen consumption rates (OCR) are shown normalized to the Met+-treated sample. Error bars represent normalized standard deviation, $n = 4$ replicates; statistical differences between Met+ media and Met-Hcy+ media treatments are indicated by asterisk where $p \leq 5.0 \times 10^{-7}$.

- Avoiding image manipulation
- You should never knowingly manipulate your images to change or improve your results. To avoid inadvertent manipulation you should only minimally process your figures before submitting them to the journal, your submitted images should faithfully represent the original image files.
- Adjusting the brightness or contrast of an image, in fluorescent microscopy for example, is only acceptable if applied equally across all images including the controls
- The cropping of images in the creation of figures should be avoided unless it significantly improves the clarity or conciseness of presentation. Be sure that the cropping does not exclude any necessary information for the understanding of the figure, such as molecular markers in electrophoresis gels.
- Any adjustments or processing software used should be stated.
- *TIP: keep copies of the original images, files and metadata used to create your figures as these can be requested by the journal during the review process.*
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Tables and figures

- Tables and figures are commonly used in research papers to supplement text.
- This post looks at just one aspect, namely **titles**, of tables and figures (although with figures it is customary to refer to titles as captions). I want to touch upon three points:
 - 1. How to phrase the titles (complete sentences or sentence fragments)
 - 2. How to style or format them for print (normal, bold, italics and the capitalization)
 - 3. How to end them (with a full stop or with no terminal punctuation)
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- Find detailed guidance on how to design tables and prepare figures for publications in this dedicated section: [Tables and Figures](#).
- Let us dive into the tips:
- Number all tables and figures (even when there is only one table or a figure).
- Phrase them as complete and declarative sentences that capture their essence if you are using them in reports and presentations and as sentence fragments that indicate their scope if they are part of a research paper.
- Set off the word 'Table' or 'Figure' and the number that follows in **bold** but keep the rest in normal font (neither bold nor italics).
- **No punctuation is required** between the number and the title: space alone is enough.
- Use normal capitalization for complete sentences; for the fragments, you may use normal capitalization or the so-called '**title case**' (Every Significant Word Begins with a Capital).
- End a title phrased as a sentence with a full stop, but use no punctuation mark at the end of a sentence fragment.
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- Tables and figures, although important components of many research papers, are just that—components; you can publish a paper without them but you cannot publish tables or figures without a paper. And if **text** is supported by **tables or figures**, it must mention them.
- Although tables and figures are what readers more often turn to first once they have chosen to examine the paper in full, it is important to draw their attention to these components *while they are reading the text of the paper*.
- To begin with, make sure that every **table and figure** is mentioned in the text. If necessary, use the “find” function of your word processor to find every mention of the words *figure* and *table* and match every instance with the correct table or figure as appropriate. In doing so, make sure that the search is “case insensitive,” that is make sure that the option “Match case” is **unchecked** (so that you find both table/Table and figure/Figure).

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- Avoid such expressions as “Figure 2 shows” or “As can be seen in Table 3.” Instead, bring in a particularly noteworthy or interesting or important value or an aspect of an image not readily apparent at a glance: thus primed, readers will know why the table or figure is relevant and can relate to it more easily. In such constructions, the table or figure goes in brackets, as in “The highest rainfall is usually received in April (Table 1).”

Reference

- **Referencing** means acknowledging your source: in the body of your work (in-text **referencing** or citation) AND.
- linking your citations to your list of works cited (also reference list or bibliography). See the glossary for the full explanation of these terms and the **referencing** style guides for stylistic information.

How do you cite in referencing

- Include an in-**text citation** when you refer to, summarize, paraphrase, or quote from another source.
- For every in-**text citation** in your paper, there must be a corresponding entry in your **reference** list.
- APA in-**text citation** style uses the author's last name and the year of publication, for example: (Field, 2005).

Why it is important

- **Referencing** allows you to acknowledge the contribution of other writers and researchers in your work. Any university assignments that draw on the ideas, words or research of other writers must contain citations. **Referencing** is also a way to give credit to the writers from whom you have borrowed words and ideas.



- **There are two types of citations.**
- In-text **citations** appear throughout your paper at the end of a sentence you are **citing**. ...
- Works cited page (MLA) or reference list (APA) **citations** give all of the information your reader would need to find your source.

- **MLA** format follows the author-page method of in-text **citation**. This means that the author's last name and the page number(s) from which the quotation or paraphrase is taken must appear in the text, and a complete reference should appear on your **Works Cited** page.
- When using **APA format**, follow the author-date method of in-text **citation**. This means that the author's last name and the year of publication for the source should appear in the text, like, for example, (Jones, 1998). One complete **reference** for each source should appear in the **reference** list at the end of the paper.

APA referencing

- **APA referencing style is an author-date referencing system published by the American Psychological Association. There are two components in the APA referencing style: in-text citations and their corresponding reference list entries.**
- **There are many styles of referencing, one of the most popular (in UK institutions) is the Harvard system, the remainder of this article deals with the Harvard referencing system. Your university may prefer the use of a different referencing system, check with your lecturer or in any study skills information you have been provided with.**

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Main reason for referencing

- To acknowledge an intellectual debt to another author and to avoid plagiarism.
- Support.
- **There are several different styles of referencing:**
- APA.
- MLA.
- Oxford.
- Harvard.
- Chicago.

example

- Alvarez, E., & Tippins, S. (2019). Socialization agents that Puerto Rican college students use to make financial decisions. *Journal of Social Change*, 11(1), 75–85.
- <https://doi.org/10.5590/JOSC.2019.11.1.07>
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When should you reference

- Referencing is an important part of academic work.
- It puts your work in context, demonstrates the breadth and depth of your research, and acknowledges other people's work.
- **You should reference** whenever **you** use someone else's idea.

Why Do We Cite and Reference?

- When writing assignments for your studies, academic papers outlining our research or reports for work, you need to highlight your use of other author's ideas and words so that you:
 - give the original author credit for their own ideas and work
 - validate your arguments
 - enable the reader to follow up on the original work if they wish to
 - enable the reader to see how dated the information might be
 - prove to your tutors/lecturers that you have read around the subject
 - avoid plagiarism

What is Plagiarism?

- Presenting another's ideas as if they are your own – either directly or indirectly
- Copying or pasting text and images without saying where they came from
- Not showing when a quote is a quote
- Summarising information without showing the original source
- Changing a few words in a section of text without acknowledging the original author

Be Organized

- **When writing an essay, report, dissertation or other piece of academic work the key to referencing is organisation, keep notes of the books and journal articles you have read, the websites you have visited as part of your research process.**
- There are various tools to help, your university may be able to provide you with some specialist software (Endnote – www.endnote.com) or you can simply keep a list in a document or try Zotero (www.zotero.org) a free plugin for the Firefox browser.

What Needs to be Recorded

- Record as much information as possible in references to make finding the original work simple.
- Author/s
- **Examples:**
- Date of Publication
- Title of Piece
- Publisher Information
- Page Numbers
- The reference list would then include the full reference:
- Clanchy, M.T. (1993) *From Memory to Written Record England 1066 – 1307* Oxford, Blackwell, p. 115.
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Appendices

- An **appendix** contains supplementary material that is not an essential part of the text itself but which may be helpful in providing a more comprehensive understanding of the **research** problem and/or is information which is too cumbersome to be included in the body of the paper.

Importance

- **Your research paper must be complete without the appendices**, and it must contain all information including tables, diagrams, and results necessary to address the research problem. The key point to remember when you are writing an appendix is that the information is non-essential; if it were removed, the paper would still be understandable.
- **It is appropriate to include appendices...**
- When the incorporation of material in the body of the work would make it poorly structured or it would be too long and detailed and
- To ensure inclusion of helpful, supporting, or essential material that would otherwise clutter or break up the narrative flow of the paper, or it would be distracting to the reader.

Structure and writing style

- **It is usually good practice to include your raw data**
- **Any tables and figures included in the appendix should be numbered as a separate sequence from the main paper.**
- **If you have more than three appendices, consider listing them on a separate page at the beginning of your paper.**
- **The appendix can be a good place to put maps, photographs, diagrams, and other non-textual elements**
- **An appendix should be streamlined and not loaded with a lot information.**

contents

- Supporting evidence [e.g. raw data]
- Contributory facts or specialized data [raw data appear in the appendix, but with summarized data appearing in the body of the text].
- Sample calculations
- Technical figures, graphs, tables, statistics
- Detailed description of research instruments
- Maps, charts, photographs, drawings
- Letters, emails, and other copies of correspondence
- Questionnaire/survey instruments, with the results appearing in the text
- Complete transcripts of interviews
- Complete field notes from observations
- Specification or data sheets

Here are some general guideline on how to format appendices,

- Appendices may precede or follow your list of references.
- Each appendix begins on a new page.
- The order they are presented is dictated by the order they are mentioned in the text of your research paper.
- The heading should be "Appendix," followed by a letter or number [e.g., "Appendix A" or "Appendix 1"], centered and written in bold.
- Appendices must be listed in the table of contents [if used].
- The page number(s) of the appendix/appendices will continue on with the numbering from the last page of the text.

Revising editing

- **Revising** and **editing** are the stages of the writing process in which you improve your work before producing a final draft. ... During **editing**, you take a second look at the words and sentences you used to express your ideas and fix any problems in grammar, punctuation, and sentence structure.

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- Keep some of the following strategies in mind:
- ∅ Take a break after finishing the draft. A few hours may be enough; a whole night or day is preferable
- ∅ Ask someone to read and react to your draft.
- ∅ Outline your draft. Highlight the main points supporting the thesis, and convert these sentences to outline form. Then examine the outline you have made for logical order, gaps, and digressions.
- ∅ Listen to your draft. Read the draft out loud to yourself or a friend or classmate, record and listen to it, or have someone read the draft to you.
- ∅ Ease the pressure. Don't try to re-see everything in your draft at once.
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Use this checklist for global revision to assist you in getting started:

- Purpose and audience
- Focus
- Organization and paragraphing
- Content
- Point of view

- Once you feel you have a solid draft after multiple revisions, you then move on to the editing and proofreading stage. Smaller-scale matters like sentence structure, word choice, grammar, punctuation, spelling and mechanics are examined at the editing and proofreading stages.
- Some strategies to keep in mind at this stage are:

- ∅ Take a break. Even fifteen minutes can clear your head.
- ∅ Read the draft slowly, and read what you actually see. Otherwise you are likely to read what you intended to write but did not.
- ∅ Read as if you are encountering the draft for the first time. Put yourself in the reader's place.
- ∅ Have a classmate, friend, or relative read your work. Make sure you understand and consider the reader's suggestions, even if you decide not to take them.
- ∅ Read the draft aloud and listen for awkward rhythms, repetitive sentence patterns, and missing or clumsy transitions.
- ∅ Learn from your own experiences. Keep a record of the problems that others have pointed out in your previous writing. When editing, check for the same types of errors.

- Are my sentences clear? Do my words and sentences mean what I intend them to mean? Is anything confusing?
- Are my sentences effective? How well do words and sentences engage and hold the reader's attention? Where does the writing seem wordy, choppy, or dull?
- Do my sentences contain errors? Where do surface errors interfere with the clarity and effectiveness of my sentences? Check especially for: sentence fragments, comma splices, verb errors, and pronoun errors.
- How is my word choice? Have I used appropriate and exact language? Do I overly repeat words that should be changed for variety?
- Have I used effective transitions both between sentences and between paragraphs?
- Is my spelling accurate and punctuation correct?

List of abbreviations

- In abbreviation (from Latin brevis, meaning short) is a shortened form of a word or phrase, by any method. It may consist of a group of letters, or words taken from the full version of the word or phrase; for example, the word abbreviation can itself be represented by the abbreviation abbr., abbrev., or abbrev.; NBM, for nil (or nothing) by mouth is an abbreviated medical instruction. It may also consist of initials only, a mixture of initials and words, or words or letters representing words in another language (for example, e.g., i.e. or RSVP). Some types of abbreviations are acronyms (which are pronounceable), initialisms (using initials only), or grammatical contractions or crasis.

- Abbreviations, Symbols and nomenclature

List of abbreviations

- BPEO- Best Practicable Environmental Option
- DFT -Density Functional Theory
- DoE -United States Department of Energy
- EPA -Environmental Protection Abbreviation Full Meaning
- ANSTO- Australian Agency
- GGA -Generalised Gradient Approximation
- HADES- Harwell Automatic Defect Examination System code
- HF -Hartree-Fock
- HLW- High Level Waste
- ILW -Intermediate Level Waste
- IT-SOFC Intermediate Temperature SOFC
- LDA -Local Density Approximation